

University of Louisville

ThinkIR: The University of Louisville's Institutional Repository

Electronic Theses and Dissertations

5-2011

The effect of a communication protocol implementation on nurse/physician collaboration and communication.

Jacqueline Carter Gerard 1948-
University of Louisville

Follow this and additional works at: <https://ir.library.louisville.edu/etd>

Recommended Citation

Gerard, Jacqueline Carter 1948-, "The effect of a communication protocol implementation on nurse/physician collaboration and communication." (2011). *Electronic Theses and Dissertations*. Paper 487. <https://doi.org/10.18297/etd/487>

This Doctoral Dissertation is brought to you for free and open access by ThinkIR: The University of Louisville's Institutional Repository. It has been accepted for inclusion in Electronic Theses and Dissertations by an authorized administrator of ThinkIR: The University of Louisville's Institutional Repository. This title appears here courtesy of the author, who has retained all other copyrights. For more information, please contact thinkir@louisville.edu.

**THE EFFECT OF A COMMUNICATION PROTOCOL IMPLEMENTATION
ON NURSE/PHYSICIAN COLLABORATION AND COMMUNICATION**

By

**Jacqueline Carter Gerard
B.A., University of Kentucky, 1970
M.A., Spalding University, 1976**

**A Dissertation
Submitted to the Faculty of the
Graduate School of the University of Louisville
in Partial Fulfillment of the Requirements
for the Degree of**

Doctor of Philosophy

**Department of Education, Leadership, Foundations
and Human Resource Education
University of Louisville
Louisville, Kentucky**

May 2011

THE EFFECT OF A COMMUNICATION PROTOCOL IMPLEMENTATION
ON NURSE/PHYSICIAN COLLABORATION AND COMMUNICATION

By

Jacqueline Carter Gerard
B.A., University of Kentucky, 1970
M.A., Spalding University, 1976

A Dissertation Approved on

3/8/11

Date

By the following Dissertation Committee:

John Keedy, Dissertation Director

Robert Topp

Mark Chi

Carla Herman

DEDICATION

With gratitude I dedicate this dissertation:

To my parents, Lee and Rose Carter,
for fostering the values of hard and excellent work;

To my family, Paul, Whit, and Carter Gerard and Kathy Meek Morgan,
for encouraging and sustaining my commitment;

And to my sister, Linda Carter Biddle (1952-2010),
for modeling courage, focus, and perseverance in pursuit of a goal.

ACKNOWLEDGMENTS

I would like to thank my dissertation chairman, Dr. John Keedy, for his commitment to high standards in composition. His demand and coaching for succinct, clear prose produced a much improved dissertation and a proficient author. Dr. Robert Topp of the University of Louisville School of Nursing deserves my abundant gratitude for his enthusiastic encouragement and his willingness to guide me through two quantitative research questions. Virginia Callen saved me much time and consternation with her excellent and reliable editing. Finally, I am indebted to the Community Hospital nurses and physicians, who shared their time, attitudes, and experiences.

ABSTRACT

THE EFFECT OF A COMMUNICATION PROTOCOL IMPLEMENTATION ON NURSE/PHYSICIAN COLLABORATION AND COMMUNICATION

Jacqueline Carter Gerard

May 14, 2011

This study examined the effect on physician/nurse collaboration and communication of the implementation of the SBAR protocol, used as nurses reported patient changes to physicians, in a Midwestern community hospital ICU. The design was a two-phased descriptive design. Data were collected through two *surveys*, one of which addressed collaboration and the other which addressed communication factors. The surveys were administered to ICU nurses ($n = 28$) and physicians ($n = 30$) three times. The study also explored attitudes regarding the efficacy of SBAR and interdisciplinary collaboration through *interviews* with a representative sample of physicians ($n = 10$) and nurses ($n = 10$).

The collaboration and communication scores analyses, which employed a significance level of ($p = .05$) and repeated measures ANOVA, established the following key findings: (a) Nurses perceived that nurse-physician collaboration had significantly improved between Time 1 and Time 3; (b) physicians did not perceive that nurse-physician collaboration had significantly improved; (c) at Time 1, the physicians scored significantly higher than the nurses on communication elements of *openness* and *understanding*; and (d) the nurses perceived that *understanding* had significantly

improved between Time 1 and Time 2 and between Time 1 and Time 3. Interview data generally confirmed the survey findings. Nurses affirmed that SBAR should be taught to all new nurses, but both nurses and physicians perceived the Recommendation statement as overly assertive.

Several implications arose from this study: (a) Nurses wanted more collaboration with physicians and perceived that SBAR increased collaboration and improved understanding; (b) physicians did not voice wanting improved collaboration and perceived that SBAR had not changed either collaboration or communication; and (c) authors of SBAR might study the effectiveness of the Recommendation statement.

TABLE OF CONTENTS

	PAGE
DEDICATION	iii
ACKNOWLEDGMENTS	iv
ABSTRACT	v
LIST OF TABLES	xv
LIST OF FIGURES	xvii
 CHAPTER	
I. INTRODUCTION	1
Background	2
Research Problem	6
Purpose of the Study	7
Design Overview	7
Significance of the Study	8
Definition of Terms	10
II. LITERATURE REVIEW	14
Health Care Reform	15
Institute of Medicine of the National Academies	15
National Coalition on Health Care	20
Summary of Health Care Reform	22
Variables of Organizational Culture	23
The Development and Significance of Subcultures	23
Person-culture Fit and Employee Satisfaction	31
Organizational Culture Characteristics and Performance	38
Summary of Variables of Organizational Culture	41
Organizational Culture and Performance of Health Care Organization ...	43
Assessment of Health Care Culture	44
Organization Redesigns/Major Changes and Culture	54
Relationship of Culture Type to Health Care Organizational Performance	77
Summary of Organizational Culture and Performance of Health Care Organizations	105
Organizational Culture and Performance of the ICU	107
The Petition for a Collaborative Culture by Nursing and Physician Organizations	108
The Relationship of Culture and Performance in the ICU	111

TABLE OF CONTENTS (continued)

CHAPTER	PAGE
Variation in ICU Team Members' Perceptions of Culture and Collaboration	133
Communication Improvements in the ICU	150
Summary of the Organizational Culture and Performance of the ICU	163
Crew Resource Management and SBAR	165
Morning Briefings	167
Daily Goal Sheets	169
SBAR	173
Summary	180
III. METHODS	184
Research Questions	184
Study Design	185
Site Selection of the Hospital and Its Context	188
Implementation of SBAR	190
RQ1: Did the Implementation of SBAR, Used in the ICU as Nurses Reported Patient Changes and Needs to Physicians, Result in Improved Collaboration between the Unit Physicians and Nurses As Measured by the Collaborative Practice Scales and the Individual Subscales of the Physician and Nurse Scales?	191
Sample Selection	191
Instrumentation to Address RQ1: The Collaborative Practice Scales (CPS)	193
The Validity of the CPS	194
The Reliability of the CPS	197
Data Collection	199
Data Analysis	200
Data Management	200
Statistical Analyses	201
RQ2: Did the Implementation of SBAR, Used in the ICU, as Nurses Reported Patient Changes and Needs to Physicians, Result in Improved Communication Elements of (a) Openness, (b) Accuracy, and (c) Understanding between the Unit Physicians and Nurses as Measured by Selected Scales of the ICU Nurse-Physician Questionnaire?	202
Sample Selection	202
Instrumentation to Address RQ2: ICU Nurse-Physician Questionnaire	202
The Validity of The ICU Physician-Nurse Questionnaire	203
The Reliability of The ICU Physician-Nurse Questionnaire	204
Data Collection	205
Data Analysis	205

TABLE OF CONTENTS (continued)

CHAPTER	PAGE
RQ3: What Were the Nurse and Physician Attitudes Toward Collaboration and Communication Regarding SBAR Implementation as Measured by Interviews?	205
Sample Selection	205
Data Collection Methods	208
Data Analysis	209
Trustworthiness of the Data	211
IV. RESULTS	212
RQ1: Did the Implementation of SBAR, Used in the ICU as Nurses Reported Patient Changes and Needs to Physicians, Result in Improved Collaboration Between the Unit Physicians and Nurses as Measured by the Collaborative Practice Scales and the Individual Subscales of the Physician and Nurse Scales?	213
Nurses	214
Sample	214
Sample Demographics	214
Completed Nurse Sample	214
Not Completed Nurse Sample	216
Statistical Comparisons of the Nurse Samples	216
The Collaborative Practice Scale Nurse Scores	217
Descriptive Statistics of the CPS Nurse Composite Scores	218
Descriptive Statistics of the CPS Nurse Subscale Scores	218
Inferential Statistical Analysis of the CPS Nurse Scores	220
Analysis of the CPS Nurse Composite Scores	220
Inferential Statistical Analysis of the CPS Nurse Subscale Scores	221
Physicians	224
Sample Demographics	224
Completed Physician Sample	225
Not Completed Physician Sample	225
Statistical Comparisons of the Physician Samples	228
Descriptive Statistics of the CPS Physician Composite Scores	228
Descriptive Statistics of the CPS Physician Subscale Scores ...	229
Inferential Statistical Analysis of the CPS Physician Scores	231
Analysis of the CPS Physician Composite Scores	231
Analysis of the CPS Physician Subscale Scores	232
RQ2: Did the Implementation of SBAR, Used in the ICU as Nurses Reported Patient Changes and Needs to Physicians, Result in Improved Communication Elements of (a) Openness, (b) Accuracy, and (c) Understanding Between the Unit Physicians and Nurses as Measured by Measured by Selected Scales of the ICU Nurse-Physician Questionnaire?	234

TABLE OF CONTENTS (continued)

CHAPTER	PAGE
Samples	236
Nurse Sample	236
Physician Sample	236
Samples Comparison	236
The ICU Physician-Nurse Questionnaire Between-group	
Communication Elements of Openness, Accuracy, and Understanding	237
Communication Element of Openness	237
Descriptive Statistics	237
Inferential Statistics	238
Communication Element of Accuracy	240
Descriptive Statistics	240
Inferential Statistics	241
Communication Element of Understanding	243
Descriptive Statistics	243
Inferential Statistics	244
RQ3: What Were the Nurse and Physician Attitudes toward	
Collaboration and Communication Regarding SBAR Implementation	
as Measured by Interviews?	246
Nurse Attitudes Toward Collaboration and Communication	
Regarding SBAR Implementation	247
IP1(a). Please Describe a Professional Relationship with a	
<u>Physician</u> That You Considered Collaborative and Successful	
and (b) How That Relationship Affected Patient Care. Please	
Comment on the Relevancy, Their Importance, and Appropriate-	
ness of the Following Actions to Your Story of Collaborative	
<u>Nurse/Physician</u> Care of the Patient: (a) Telling <u>Physicians</u>	
When Their Orders Seem Inappropriate (CPS-N, 7); (b) Suggest	
to <u>Physicians</u> Approaches to Patient Care That I Think Are Useful	
(CPS-N, 5); (c) Telling <u>Physicians</u> My Assessment of Difficulties	
Related to a Patient's Ability to Deal with a Treatment Option and	
Its Consequences (CPS-N, 8); or (d) Telling a <u>Physician</u> That My	
Area of Professional Expertise Is Greater Than He Thinks It Is	
(CPS-N, 3)	247
Physician Communication Strategies	248
Physician Practices	250
Physician Behaviors Affirming Nurse Collegial Role	252
IP(b). Please Describe the Effects of This Collaborative	
Relationship Upon Patient Care.	256
Collaboration Contributes To Positive End-of-Life Care	
(RN1 and RN2)	256
ICU Patients Are Taken Off the Ventilator More Quickly	
(RN1, RN2, and RN4)	257

TABLE OF CONTENTS (continued)

CHAPTER	PAGE
Critically Ill Patients Unexpectedly Recover (RN3, RN7, RN8, and RN9)	257
IP2. How Has the Adoption of SBAR Affected Your Communication or Relationships with the <u>Physicians</u> and Patients? How Has the Adoption of SBAR Affected (a) the Understanding That Occurs Between You and <u>Physicians</u> (ICU N-P Q, 6); (b) the Openness Between You and <u>Physicians</u> (ICU N-P Q, 3); (c) the Enjoyment of You Talking with <u>Physicians</u> (ICU N-P Q, 5.); and (d) the Timeliness of Information (ICU N-P Q, 10, 11, 12, and 13)?	258
Effect of SBAR on Communication or Relationships with <u>Physicians</u> and Patients	258
Understanding Between the Interviewee and <u>Physicians</u>	259
Openness Between the Interviewee and <u>Physicians</u>	260
Enjoyment of Talking with <u>Physicians</u>	261
Timeliness of Information	261
IP3. From a <u>Nurse's</u> Point of View, What Are Your Feelings About Making the Recommendation Phase of SBAR To a <u>Physician</u> ? What Experiences Have You Had With <u>Physicians</u> When You Have Made the Recommendation? How Have You Phrased the Recommendation?	262
Nurse Phrasing of Recommendation	262
<u>Nurse</u> Feelings Toward and Experiences of Making the Recommendation	263
IP4. As With Any Change, I Am Sure That You Have Made or Heard Remarks, Told or Heard Stories, or Heard or Had Conversations About SBAR and Its Implementation. Please Share Some of These To Help Us Understand More Fully the Attitudes Toward This Communication Tool	265
Experienced Nurses Did Not Accept the Required Completion of the SBAR Template (RN1, RN2, RN 3, RN4, RN5, & RN8)	266
Experienced Nurses Believed That They Already Practiced SBAR Principles (RN1, RN2, RN3, RN4, and RN8)	266
Nurses Agreed That SBAR Training and Practice Was Excellent for Inexperienced Nurses (RN2, RN3, RN4, RN5, RN6, RN7, and RN9)	266
Many Physicians Did Not Want the SBAR Detail (RN9 and RN10)	267
One Physician Coached an Inexperienced Nurse (RN6)	267
Physician Attitudes Toward Collaboration and Communication Regarding SBAR Implementation	267

TABLE OF CONTENTS (continued)

CHAPTER	PAGE
IP1(a). Please Describe a Professional Relationship With a <u>Nurse</u> That You Considered Collaborative and Successful and (b) How That Relationship Affected Patient Care. Please Comment on the Relevancy, Their Importance, and Appropriateness of the Following Actions To Your Story of Collaborative <u>Nurse/Physician</u> Care of the Patient: (a) Coming to Consensus With <u>Nurses</u> on the Best Way To Approach Care for a Particular Patient? (CPS-P, 7); (b) Ask for <u>Nurse</u> Input into Treatment Plan Development (CPS-P, 4); (c) Ways To Strengthen the Patient’s Support System (CPS-P, 2); or (d) Acknowledging To <u>Nurses</u> the Areas of Healthcare Where They Have More Expertise Than I Have (CPS-P, 9)	268
Nurse Communication Strategies	268
Nurse Knowledge and Competence	271
Nurse-Physician Rounding Process	274
IP1(b). Please Describe the Effects of This Collaborative Relationship Upon Patient Care	274
Prevented Medical Crises in Patients (MD8 and MD10)	274
Prevented Errors (MD1, MD2, and MD7)	275
Initiated a Disciplinary Procedure Against a Physician (MD3) ..	275
Identified Depression Overlooked by a Physician (MD5)	285
IP2. How Has the Adoption of SBAR Affected (a) the Understanding That Occurs Between You and <u>Nurses</u> (ICU N-P Q, 6);(b) the Openness between You and <u>Nurses</u> (ICU N-P Q, 3); (c) the Accuracy of Information Which You Receive From <u>Nurses</u> (ICU N-P Q, 2, 4, 7); and (d) the Timeliness of Information (ICU N-P Q, 10, 11, 12, and 13)?	276
Effect of SBAR on the Understanding between You and Nurses (ICU N-P Q, 3)	276
The Openness Between You and Nurses (ICU N-P Q, 3)	277
Accuracy of Information Which You Receive From Nurses (ICU N-P Q, 2, 4, 7)	278
Timeliness of Information (ICU N-P Q, 10, 11, 12, and 13)	278
IP3. From a <u>Physician’s</u> Point of View, What Is the Most Acceptable Verbiage for a <u>Nurse</u> To Use To Make the Recommendation? What Are Your Experiences or Reactions To Receiving the Recommendation Phase of SBAR From a <u>Nurse</u> ? ...	279
Physician’s Preferred Verbiage of the Recommendation	279
Physician Experiences With Receiving the Recommendation Phase of SBAR	280

TABLE OF CONTENTS (continued)

CHAPTER	PAGE
IP4. As With Any Change, I Am Sure That You Have Made or Heard Remarks, Told or Heard Stories, or Heard or Had Conversations About SBAR and Its Implementation. Please Share Some of These To Help Us Understand More Fully the Attitudes Toward This Communication Too.	281
Summary of Findings	282
RQ1: Did the Implementation of SBAR, Used in the ICU as Nurses Reported Patient Changes and Needs To Physicians, Result in Improved Collaboration Between the Unit Physicians and Nurses as Measured by the Collaborative Practice Scales and the Individual Subscales of the Physician and Nurse Scales?	282
RQ2: Did the Implementation of SBAR, Used in the ICU as Nurses Reported Patient Changes and Needs To Physicians, Result in Improved Communication Elements of (a) Openness, (b) Accuracy, and (c) Understanding Between the Unit Physicians and Nurses as Measured by Selected Scales of the ICU Nurse-Physician Questionnaire?	283
RQ3: What Were the Nurse and Physician Attitudes toward Collaboration and Communication Regarding SBAR Implementation as Measured by Interviews?	283
Characteristics of Collaborative Physicians and Nurses	284
Effects of Collaborative Nurse-Physician Relationships	286
Effect of SBAR on Nurse-Physician Relationships and Communication Elements	287
Phrasing of and Experiences with SBAR Recommendation	288
Stories Heard Concerning SBAR Implementation	290
V. SUMMARY AND CONCLUSIONS	291
Purpose of the Study	292
Summary of Findings	292
Discussion of the Findings	295
RQ3: What were the nurse and physician attitudes toward collaboration and communication regarding SBAR implementation as measured by interviews?	296
The Nurse-Physician Collaborative Culture	296
Findings Related to SBAR	303
RQ1: Did the Implementation of SBAR, Used in the ICU as Nurses Reported Patient Changes and Needs To Physicians, Result in Improved Collaboration between the Unit Physicians and Nurses as Measured by the Collaborative Practice Scales and the Individual Subscales of the Physician and Nurse Scales?	305

TABLE OF CONTENTS (continued)

CHAPTER	PAGE
RQ2: Did the Implementation of SBAR, Used in the ICU as Nurses Reported Patient Changes and Needs To Physicians, Result in Improved Communication Subscales of (a) Openness,(b) Accuracy, and (c) Understanding between the Unit Physicians and Nurses as Measured by Selected Scales of the ICU Nurse-Physician Questionnaire?	310
Limitations of the Study	314
Implications of the Study	315
Policy Makers	315
Practitioners	316
Researchers	316
Conclusion	317
REFERENCES	319
APPENDIX A. COLLABORATIVE PRACTICE SCALE—N	328
APPENDIX B. COLLABORATIVE PRACTICE SCALE—P	330
APPENDIX C. BACKGROUND QUESTIONS FOR NURSES	332
APPENDIX D. BACKGROUND QUESTIONS FOR PHYSICIANS	333
APPENDIX E. ICU NURSE-PHYSICIAN QUESTIONNAIRE—NURSE SCALE; RELATIONSHIPS AND COMMUNICATIONS WITHIN THE ICU	334
APPENDIX F. ICU NURSE-PHYSICIAN QUESTIONNAIRE—PHYSICIAN SCALE; RELATIONSHIPS AND COMMUNICATIONS WITHIN THE ICU	336
APPENDIX G. INTERVIEW QUESTIONS FOR NURSES	338
APPENDIX H. INTERVIEW QUESTIONS FOR PHYSICIANS	340
APPENDIX I. THE FACTOR LOADINGS ON THE NURSE AND PHYSICIAN CPS SCALES	342
APPENDIX J. SCORING FOR THE COLLABORATIVE PRACTICE SCALE	345
APPENDIX K. BETWEEN-GROUP COMMUNICATION SCALES AND COMPONENT QUESTIONS OF THE ICU PHYSICIAN-NURSE QUESTIONNAIRE	347
APPENDIX L. ADMINISTRATION PROTOCOL FOR THE CPS AND SELECTED SCALES THE ICU NURSE-PHYSICIAN QUESTIONNAIRE	350
APPENDIX M. DEFINITION LIST FOR RQ3 INTERVIEWS	353
APPENDIX N. CHARACTERISTICS OF COLLABORATIVE PHYSICIANS	354
APPENDIX O. CHARACTERISTICS OF COLLABORATIVE PHYSICIANS	355
CURRICULUM VITAE	356

CHAPTER I

INTRODUCTION

Health care organizations and the United States health system currently experience pressure to enact and sustain many reforms simultaneously. The findings of the 2005 Commonwealth Fund International Health Policy Survey, a survey of more than 7,000 adults in Australia, Canada, New Zealand, United Kingdom, United States, and Germany, illustrated the myriad issues confronting the American health system: (a) Of the nationalities surveyed, Americans were significantly more likely to pay at least \$1000 in out-of-pocket expenses; (b) care coordination failures occurred most frequently in the U.S. with a third of patients reporting failures; and (c) American and German patients in the chronically ill category, which includes those suffering from congestive heart failure and diabetic patients, were the least likely to say that they had been given a self-management plan (as cited in Schoen, Osborn, Trang Huynh, Doty, Zapert, Peugh, et al., 2005). These researchers summarized the systemic problems: “The United States often stands out with high medical errors and inefficient care and has the worst performance for access/cost barriers and financial burdens” (Schoen et al., 2005, p. 510).

Health care access barriers have been buttressed as health insurance premium increases accelerated annually since 1998: The accrual in 2003, 13.9%, was almost four times the 1998 increase (*Building a Better Health Care System; Specifications for*

Reform, 2004).

As premiums ballooned for individuals and companies, fewer Americans were insured (*Building a Better Health Care System; Specifications for Reform, 2004*).

The economic ramifications of this inflation reach beyond American families: Spiraling costs in the United States decreased the national global competitiveness and, if continued, the cost increases would limit long-term fiscal growth (Gabel & Fetzer, 2003).

The economic factor of American healthcare does not represent the sole healthcare concern of the public and policy makers. The leaders of disparate American institutions petition for system transformation and healthcare policy reform. These proposed reforms will affect and be affected by the cultures of health care organizations and units where providers deliver care to patients. Gaucher- Marzlekkare and Coffee (as cited in Nystrom, 1993), authors of *Transforming Healthcare Organizations: How to Achieve and Sustain Organizational Excellence*, posited that cultural change was at the center of successful healthcare organizational transformations.

Background

The Institute of Medicine (IOM) and other entities established the imperative for American healthcare reform (Committee on Quality Healthcare in America, 2000 and 2001; Committee on the Work Environment for Nurses and Patient Safety, 2004; Schoen et al. 2005): The healthcare system must deliver higher outcomes in safety, quality, and patient and nursing satisfaction, while simultaneously controlling costs (*Building a Better Health Care System; Specifications for Reform, 2004*).

To provide incentives for organizational change and defined high performance, government, business coalitions, and insurance payers enacted the first stage of pay for performance programs. When fully implemented, these programs will provide reimbursement incentives for defined high outcomes (National Committee for Quality Health Care, 2006).

Another initiative, public reporting of clinical processes and outcomes is complimentary to the pay for performance initiative. The public currently can view clinical outcomes on governmental and hospital credentialing websites: Hospitals must report defined process and outcome measures on at least three clinical conditions (i.e., heart attack, heart failure, pneumonia) (National Committee for Quality Health Care, 2006) to receive full payment for Medicare patients and to maintain accreditation eligibility by the Joint Commission, an independent, not-for-profit accreditation organization for over 14,000 United States healthcare organizations (http://www.jointcommission.org/AboutUs/joint_commission_facts.htm, retrieved October 21, 2007). Now limited in scope and number, the future measurement sets are likely to (a) be far more comprehensive, (b) measure outcomes longitudinally, and (c) pertain to the IOM individual health care goals: “safety, effectiveness, consumer-centric, timely, efficient and equitable” (as cited in National Committee for Quality Health Care, 2006, p. 16).

To deliver these higher performance outcomes, leaders, who understand that organizational culture is related to its performance (Rousseau, 1990), will assess their organizational cultures. In their culture assessments, leaders should examine the degree of collaboration that exists within and between departmental and functional subcultures

and which employees manifest in communication, problem solving, product delivery, and daily work (Cohen et al., 2004; Jones et al., 1997; Lanagan-Fox & Tan, 1997; Rizzo et al., 1994; Silvester et al., 1999; Smith et al., 2000).

Health care cultures emphasizing collaboration are related positively to process and performance outcomes: (a) commitment, job involvement, empowerment, and job satisfaction (Baggs & Ryan, 1990); (b) inpatient satisfaction (Meterko et al., 2004); (c) implementation of Quality Improvement methodology (Parker et al., 1999); and (d) organizational readiness, the organizational ability to change and adapt (Ingersoll et al., 2002), but (e) negatively related to intent to turnover (Gifford et al., 2002; Ingersoll et al. 2002).

The positive relationship between collaboration and outcomes is particularly evident in the intensive care unit (ICU), site of complex care for critically ill patients. Collaboration in the ICU is linked with increased coordination, increased patient satisfaction, reduced length of stay, (Shortell et al., 1994), increased staff satisfaction (Baggs & Ryan, 1990), increased safety (Jain et al., 2006), better clinical outcomes (Baggs & Ryan, 1990; Knaus et al., 1986; Wheelan et al., 2003), and significant cost savings where improvements emphasizing collaboration are implemented (Clemmer et al., 1999). These outcomes of higher patient satisfaction, higher clinical outcomes, increased safety, and reduced lengths of stay and costs are tantamount to the outcomes sought in a reformed system.

Healthcare leaders seek mechanisms, which amplify collaboration among disciplines. Any strategy to increase collaboration among caregivers of various disciplines invariably will address communication. Based on their factor analysis of the

construct of collaboration, Welch and Tulbert (2000) concluded that communication, which correlated at greater than .80 with collaboration, was one of the “salient components of collaboration” (p. 369). The third IOM report (Committee on the Work Environment for Nurses and Patient Safety, 2004) posited that interdisciplinary collaboration is often described by a group of behaviors related to communication: (a) “shared understanding of goals and roles” (p. 214), (b) “effective communication,” which is demonstrated by . . . “open and inclusive discussion and active listening” (p. 214); (c) attitudes of inclusiveness, openness, and acceptance of a member’s ideas and opinions; and (d) practices for positive conflict resolution and “shared decision making” (p. 214).

To improve communication and collaboration, healthcare organizations implemented various standardized crew resource management (CRM) communication mechanisms (i.e., briefings, work sheets, checklists and communication protocols). Originally developed to foster aviation safety, CRM is a methodology to advance safety through team communication and decision making processes (Kosnik, 2002). When implemented, briefings and work sheets improved teamwork and produced positive outcomes of reduced length of stay, cost, and increased understanding among care providers (Narasimhan et al., 2006; Provonost et al., 2003; Thompson et al., 2006). A standardized communication protocol, by which the caregiver reported the patient situation, described the background, assessed the patient, and recommended an action is called SBAR. The hospital implementation of SBAR demonstrated positive safety outcomes in the only empiric report of its utilization (Haig, Sutton, & Whittington, 2006).

Even though high performance is linked with a collaborative culture and leaders seek mechanisms to increase collaboration, many barriers exist in healthcare organizations: (a) The nursing and medical professions perceived their professional relationship differently; ICU nurses regarded collaboration as being more important but occurring less frequently than their medical counterparts (Coombs 2003; King & Baggs et al., 1999; Thomas et al., 2003) (b) nurses posited that physician use of their power in decision-making inhibited collaboration (Coombs, 2003; Miller, 2001); and (c) nurse fear of physician retributions for raising issues also discouraged collaboration (Miller, 2001).

Research Problem

Health care leaders must deliver improved outcomes, demanded by the public, government, and business entities. A teamwork culture emphasizing increased collaboration between nurses and physicians is positively associated with improved outcomes. In the complex, costly care setting of the ICU, collaboration is associated with higher patient satisfaction, higher clinical outcomes, increased safety, and reduced lengths of stay and costs. To identify mechanisms increasing collaboration, health care leaders must evaluate the effects of such processes as SBAR on collaboration and communication between nurses and physicians.

The three central research questions for this study were:

1. Did the implementation of SBAR, used in the ICU as nurses reported patient changes and needs to physicians, result in improved collaboration between the unit physicians and nurses as measured by the Collaborative Practice Scales and the individual subscales of the physician and nurse scales?

2. Did the implementation of SBAR, used in the ICU as nurses reported patient changes and needs to physicians, result in improved communication elements of (a) openness, (b) accuracy, and (c) understanding between the unit physicians and nurses as measured by selected scales of the ICU Nurse-Physician Questionnaire?
3. What were the nurse and physician attitudes toward collaboration and communication regarding SBAR implementation as measured by interviews?

Purpose of the Study

The purpose of this study was to examine the effect of the SBAR protocol, used as nurses reported patient changes and needs to physicians, on physician—nurse collaboration and communication in the ICU.

Design Overview

The researcher addressed the first two research questions with pre and post repeated measures designs. The first research question was addressed with two analyses. The first analysis, a repeated measures design, featured the independent variable of survey administration time with three levels, pre-SBAR implementation, one month post-commencement of SBAR implementation, and four months post-commencement of SBAR implementation and a dependent variable of collaboration composite scores as measured on the nurse and physician Collaborative Practice Scales(Weiss & Davis, 1985) and an analysis of covariance (ANCOVA) with potential covariates including age, credentials, and citizenship status.

The second analysis, a pre and post repeated measures design, featured a separate analysis of each of the CPS nurse subscales, “direct assertion of professional

expertise/opinion” and “active clarification of mutual responsibilities” (Weiss & Davis, 1985, p. 299) and each of the CPS physician scale subscales, “consensus development with nurses” and “acknowledgment of nurse’s contribution to patient care” (Weiss & Davis, 1985, p. 299). The independent variable was the survey administration time with three levels of pre SBAR implementation, one-month post- commencement of SBAR implementation, and four months post-commencement of SBAR implementation; the dependent variable were the individual CPS subscale scores.

The second research question (RQ2) was addressed through a two- way repeated measures design. and featured: (a) two independent variables: professional group with two levels of physicians and nurses and the survey administration time with three levels of pre SBAR implementation, one-month post commencement of SBAR implementation, and four months post-commencement of SBAR implementation; (b) the dependent variables were communication elements of openness, accuracy, and understanding scores, as measured on between group communication scales of The ICU Nurse-Physician Questionnaire (Shortell, Rousseau, Gillies, Devers, & Simons, 1991)

The third research question to explore attitudes regarding the efficacy of this intervention was addressed through interviews with physicians and nurses.

Significance of the Study

This study is significant for three reasons. First, this study will attempt to meet public and payer demands for system reform; several entities promote increased effectiveness through collaboration and communication. Second, in contrast to previous research in the area, this study will define collaboration from both physician and nurse

viewpoints. Third, SBAR is a relatively new protocol and has yet to be empirically tested to improve physician-nurse collaboration.

First, the research on communication and collaboration is timely: The climate of patient safety, pay for performance, the IOM reports and public reporting creates support for increased collaboration as a vehicle to improve performance outcomes: “The study of collaboration within the construct of patient safety may provide an added impetus for change in nurse-physician collaboration that transcends historical and sociological constraints” (Dougherty & Larson, 2005, p. 252). An openness might now exist that formerly did not.

Second, many studies examine collaboration among physicians and nurses. Most collaboration research has been initiated by nurses (Dougherty & Larson, 2005); perhaps this, as Fagin (1992) suggested, is because physicians are not interested in interprofessional relationships (as cited in Dougherty & Larson, 2005). Physician and nurse interviews of this research will further illuminate their views toward the communication protocol and its effects.

Finally, this research is only the second to examine the results of SBAR implementation. The other, a case study with empiric results, is cited in this research. In January 2006, The Joint Commission, the credentialing agency for health care, stipulated that credentialed organizations implement a standardized method for communications between providers (Haig, Sutton, & Whittington, 2006). When health care leaders consider standardized methods for implementation, this research on SBAR implementation can be useful in their improvement selection.

Definition of Terms

Below are the definitions of the terms used throughout this study.

Acute Physiology and Chronic Health Evaluation (APACHE) System

The APACHE System is a risk adjustment system to forecast a patient's risk of death in a particular ICU. The risks for each patient are calculated to establish the standardized mortality ratio (SMR) for each ICU unit. The SMR is calculated by dividing each unit mortality rate by the predicted mortality rate. A SMR greater than one indicates that the recorded death rate is higher than predicted; a SMR less than one indicates that the death rate is less than predicted. The APACHE System and the SMR are used to analyze mortality rates based on the illness severity of that particular population (Wheelan et al., 2003). Various APACHE editions, signified by I, II, III, and IV, have been released.

Average Length of Stay

Average length of stay (ALOS) is a standard healthcare outcome used by hospitals to benchmark with other hospitals and to determine efficiency. The ALOS for a group of patients (i.e., coronary artery bypass surgery patients) usually is calculated by dividing the number of inpatient days by the number of admissions. Generally, when ALOS decreases, costs also decrease.

Collaboration

Collaboration, the teamwork of physicians and nurses, is characterized by their “working and communicating cooperatively together, sharing responsibility for problem-solving and decision making, and planning and implementing plans for patient

care” (as cited in Baggs & Ryan, 1990, p. 387). The IOM suggested that collaboration could be described by a group of behaviors: (a) “shared understanding of goals and roles; (b) effective communication, characterized by . . . open and inclusive discussion and active listening” (p. 214); (c) attitudes of inclusiveness, openness, and acceptance of a member’s ideas and opinions; and (d) practices for positive conflict resolution and “shared decision making” (p. 214). In the absence of developed communication skills and structures, collaboration would be challenging. In this study, collaboration is synonymous with teamwork.

Communication

Communication is the process of Person A making common a thought, opinion, or emotion with Person B. This study generally addresses communication that is verbal, intentional, and occurs between physicians and nurses regarding patients. Communication of this type is most concerned with the processes of “sharing information, asking questions, and providing suggestions” (Haig, Sutton, & Whittington, 2006, p. 168). Communication has been described as a collaboration component (Welch & Tulbert, 2000).

Crew Resource Management

Crew Resource Management (CRM) is a team management system designed to increase safety in aviation. The system “considers human performance limiters (such as fatigue and stress) and the nature of human error, and it defines behaviors that are countermeasures to error, such as leadership, briefings, monitoring and cross checking, decision making, and review and modification of plans” (as cited in McCarthy &

Blumenthal, 2006, p. 172). Many hospitals, including Johns Hopkins of Baltimore, MD, successfully adapted CRM to health care settings (Thompson et al., 2006).

Culture

Schein (1986), a leading organizational culture theorist at the Sloane School of Massachusetts Institute of Technology, defined culture as

a pattern of basic assumptions—invented, discovered, or developed by a given group as it learns to cope with its problems of external adaptation and internal integration—that has worked well enough to be considered valid and, therefore, to be taught to new members as the correct way to perceive, think, and feel in relation to these problems. (p. 9)

Intensive Care Unit

The intensive care unit (ICU) is a specialized section of the hospital that provides care for critically ill patients. Due to the patient criticality, the unit provides high nurse to patient ratios, continuous monitoring, and sophisticated technologies. Many ICUs have continuous in-unit coverage by intensives physicians, who specialize in care of critically ill patients. Apparent in this research review, ICU specialties exist in some hospitals (i.e., surgical ICU [SICU] and medical ICU [MICU]). Community Hospital, the site of this study, has a critical care unit, comprised of a ten-bed cardiac care intensive unit (CCU) on one side and a ten-bed medical-surgical intensive care unit (ICU) on the other side.

Interdisciplinary or Multidisciplinary Teams

Multidisciplinary teams are groups comprised of caregivers representing diverse disciplines (i.e., nurses, physicians, dieticians, respiratory therapists, and physical therapists) that plan, coordinate, and deliver care and services to patients. In this review the diction of both *interdisciplinary* and *multidisciplinary*, reflecting the authors' choices, is used.

Situation, Background, Assessment, Recommendation

Communication Protocol (SBAR)

A Crew Resource Management tool, SBAR is a communication protocol that provides a common and predictable structure to the communication. It can be used in any clinical domain and has been applied in obstetrics, OR, ICU and other areas (Guise, 2006; "Tips for Introducing SBAR in the OR," 2006). In a report to another provider, the health care provider structures his communication according to the acronym SBAR: (a) context or *Situation*; (b) a brief history or *Background*; (c) a clinical *Assessment* with clinical data; and (d) gives a *Recommendation*. In this study conducted at Community Hospital, the researcher implemented SBAR as a tool for nurse to physician communication regarding patients.

CHAPTER II

LITERATURE REVIEW

This research authenticates the imperative for outcome and culture change in health care and establishes that a collaborative, teamwork culture is positively related to performance outcomes of safety, efficiency, cost, satisfaction, and clinical outcomes. To establish the positive relationship between collaborative culture and positive outcomes, the telescopic review in Chapter II examines culture in studies catalogued by organizations in general, in various healthcare venues and in the intensive care units (ICUs) of hospitals. Having established the relevancy of collaborative culture to performance outcomes, the research, focused in the ICUs of a hospital, then examines the implementation effect of a communication protocol called SBAR on physician collaboration and communication between physicians and nurses.

Five sections of research frame this study: (a) health care reform, (b) variables of organizational culture, (c) organizational culture and performance of health care organizations, (d) organizational culture and performance of the intensive care unit, and (e) Crew Resource Management and SBAR. In the first section, the researcher presents institutional policy statements which assert that American health care system reform is imperative: The current fragmented health care system replete with access barriers fails to deliver the requisite outcomes of satisfaction, safety, and efficiency for patients. In the second section, variables of organizational culture, the researcher commences the

study of organizational cultures globally; introduces such variables as subcultures, cultural fit, and culture type; and concludes by examining the relationship of organizational performance to identified culture types. In the following section, organizational culture and performance of health care organizations, she investigates the relationship of organizational culture types in healthcare to other culture variables and, more important, to outcomes. In the fourth section, organizational culture and performance of the intensive care unit, she limits the investigation locally to collaborative type culture, the differing caregiver perceptions of collaboration, and the relationship of this collaborative culture type to ICU performance outcomes. Finally, she explains the health care adaptation of Crew Resource Management and the relationship of standardized communication protocol SBAR to multidisciplinary collaboration.

Health Care Reform

Authorities of the Institute of Medicine and the National Coalition on Health Care released five documents establishing the imperative for health care system reform. Cited in chronological order, the authors described the magnitude of change demanded by leaders and the public.

Institute of Medicine of the National Academies

The Institute of Medicine (IOM) of the National Academies is a nonprofit organization comprised of volunteer national and international scientists. These scientists conduct studies, which provide policy makers with objectively scientifically sound advice. (*More About the Institute of Medicine Web site*, 2006). In June 1998 IOM leaders appointed and charged the Committee on the Quality of Health Care in

America with development of a strategy, which would substantially improve healthcare over the decade. The IOM released three reports focusing on diverse aspects of needed *for the 21st Century* (Committee on Quality Health Care in America, 2001); and (c) *Keeping Patients Safe; Transforming the Work Environment of Nurses* (Committee on the Work Environment for Nurses and Patient Safety, 2004).

To Err is Human: Building a Safer Health System (Committee on Quality Health Care in America, 2000) shocked the nation with its conclusion that nearly 100,000 Americans die annually from health care errors. This report also indicted system defects which exacted a toll from the health, dignity, functioning, and resources of Americans: (a) loss of income and productivity; (b) loss of patient trust; (c) low morale of health professionals; and (d) lower levels of health status. The IOM (Committee on Quality Health Care in America, 2000) identified a comprehensive strategy by which government health care providers, industries, and consumers could substantially reduce and prevent medical errors. The report set a goal of reducing medical errors by 5% over the next five years.

To Err is Human: Building a Safer Health System (Committee on Quality Health Care in America, 2000) proposed a plan to redesign the health system at all levels with safety as a priority. The report called for an implementation strategy with four facets: (a) establishing a national focus through the creation of a Center for Patient Safety; (b) identifying and learning from errors by development of a nationwide mandatory reporting system; (c) raising performance standards for safety improvements through the actions of oversight organizations, professional groups, and group

purchasers of health care; and (d) implementing healthcare safety systems to ensure safe practices at the delivery level.

In 2001, the IOM released their second series report *Crossing the Quality Chasm: A New Health System for the 21st Century* (Committee on Quality Health Care in America, 2001). In addition to excessive medical error rates, the IOM (Committee on Quality Health Care in America, 2001) reported that the current system had additional defects: (a) Practitioners repeatedly failed to integrate evidence-based knowledge into their practices; and (b) the highly fragmented delivery system resulted in rework, service duplication and long delays. Such fragmentation resulted in increased costs for patients of an overly burdened system.

To produce safer, higher quality of care, the IOM in *Crossing the Quality Chasm: A New Health System for the 21st Century* (Committee on Quality Health Care in America, 2001) asserted that leaders should redesign the care system according to the following five-point agenda: (a) commitment of all stakeholders to a national purpose statement and to six goals outlining improvement; (b) the championing by all health care stakeholders of a new set of principles; (c) prioritization by Health and Human Services of the initial redesigns, the allocation of resources, and the initiation of the change process; (d) implementation of more support for improved care by health care organizations; and (e) creation by the Department of Health and Human Services of a new culture, which would promote and reward improvement, especially in the spheres of evidence-based practice, information technology use, and workforce preparation. In setting the goals and aims for healthcare, the IOM (Committee on Quality Health Care

in America, 2001) declared “health care should be safe, effective, patient-centered, timely, efficient, and equitable” (p. 6).

In 2004, the IOM in *Keeping Patients Safe: Transforming the Work Environment of Nurses* (Committee on the Work Environment for Nurses and Patient Safety, 2004) indicted the nursing work culture, which reduces patient safety and contributes to a nationwide nursing shortage. *Keeping Patients Safe: Transforming the Work Environment of Nurses* (Committee on the Work Environment for Nurses and Patient Safety, 2004), augmented the work of the two previous IOM reports in three ways: (a) providing further direction in organizational implementation of the key recommendations concerning the safety culture from *To Err is Human: Building a Safer Health System* and *Crossing the Quality Chasm: A New Health System for the 21st Century*; (b) adding specifics regarding some critical variables of patient safety which had not been addressed previously; and (c) producing a practical framework to create safe work environments. This third report (Committee on the Work Environment for Nurses and Patient Safety, 2004) enumerated eight recommendations for reforming the nurse environment and culture: (a) governing boards which emphasize patient safety as a priority; (b) leadership and research-based management structures and processes; (c) effective nurse leadership; (d) adequate staffing; (e) support for ongoing learning and decision support; (f) mechanisms that promote interdisciplinary collaboration; (g) work designs that promote safety; and (h) an organizational culture that continuously strengthens patient safety. The report posited that interdisciplinary collaboration might be described by a group of behaviors: (a) “shared understanding of goals and roles, (b) effective communication, characterized by . . . open and inclusive discussion and

active listening” (p. 214); (c) attitudes of inclusiveness, openness, and acceptance of a member’s ideas and opinions; and (d) practices for positive conflict resolution and “shared decision making” (p. 214).

One of the recommendations made by IOM (Committee on the Work Environment for Nurses and Patient Safety, 2004) has particular significance for this research study. Recommendation 5-6 advised that health care organizations should support interdisciplinary collaboration through such practices as interdisciplinary rounds and consistently scheduled education. All health care providers should be apprised of the communication and work practices, which foster collaboration. While acknowledging that an emphasis on collaboration among diverse health care disciplines represented a concept change, the report affirmed the value of teamwork in multidisciplinary patient care teams: “Favorable attitudes toward team performance and collaborative patient management approaches maximize team outcomes. These attitudes are particularly important for interdisciplinary groups composed of individuals with different values and expectations for discipline, performance, and scope of practice” (p. 368).

The report (Committee on the Work Environment for Nurses and Patient Safety, 2004) further commented on the relationship of collaboration to teamwork and outcomes:

Although findings concerning the relationship between the existence and performance of health care teams and patient outcomes are mixed, evidence suggests that the relationship is positive when measured carefully and with clear indication of team processes and interactions. Moreover, the concept of

collaboration within and apart from prescribed teams appears to be an important dimension of what makes teams (and individuals, dyads, or small groups) successful. Clearly, interpersonal communication, regard for others, a strong focus on patient safety goals, and constant reassessment for the environment are important aspects of the relationship between team performance and care delivery outcomes. (p. 213)

In sum, three IOM reports are relevant to this research: (a) the first two reports indicted a fragmented health care system for its safety, service, and cost outcomes, and (b) the third report identified interdisciplinary communication and collaboration as critical variables in producing successful teams and positive health care outcomes. The behavioral description of collaboration is highly relevant to this research (Committee on the Work Environment for Nurses and Patient Safety, 2004). Among these described behaviors is effective communication. One implements a standardized communication protocol, by which the caregiver reports the patient situation, describes the background, assesses the patient, and recommends an action (SBAR) to improve the communication effectiveness among health care providers of various disciplines.

National Coalition on Health Care

The National Coalition on Health Care, representing at least 150 million Americans, is comprised of nearly 100 of the largest American businesses, unions, health care providers, religious organizations, pension and health funds, insurers, and consumer groups. These groups advocated for a majority and a cross-section of the American population (*Building a Better Health Care System; Specifications for Reform*, 2004). Following an in-depth year study, the National Coalition on Health Care

(Building a Better Health Care System; Specifications for Reform, 2004) released its report, which advocated reform to confront three interlocking problems: (a) rapidly spiraling costs, (b) a huge and mounting number of uninsured Americans, and (c) “an epidemic of sub-standard care” (p. 5). Additionally, the report authors (*Building a Better Health Care System; Specifications for Reform, 2004*) listed three conditions necessary for successful and comprehensive reform: (a) Health care reform must be a priority for the nation; (b) health care reform must be systemic and adopted as a linked series of redesigns; and (c) health care reform must be system-wide with application to all patients, providers, and consumers.

The report (*Building a Better Health Care System; Specifications for Reform, 2004*) proposed a foundation of reform principles: (a) All Americans should have health insurance; the report called for achievement of 100% health care coverage with mandatory participation within three years after the passage of legislation; (b) the system must manage costs; cost management measures should achieve the goal that average annual percentage cost increases should be equivalent with annual percentage increases in per-capital gross domestic product within five years of the legislation; (c) health care quality and safety must be improved; payments should be linked to the measured quality of care; (d) financing must be equitable; reform should cease the practice of shifting cost across different payers and should distribute the financial burdens more equitably; and (e) administration must be simplified to decrease cost increases for system administration, nearly \$300 billion annually.

The preface of the report (*Building a Better Health Care System; Specifications for Reform, 2004*) emphasized the urgency and scope of the needed reform:

That these recommendations were developed by such a diverse and large aggregation of powerful organizations—representing such a broad swath of our economy and society—should be heartening to those who had given up on the prospects for policy responses commensurate with the scope of the challenges we face. We should not be resigned to settling for small steps forward—not when the problems of the health care system are growing by leaps and bounds. We need systemic and rapid reform. (p. 4)

Summary of Health Care Reform

Health care in America requires urgent and systemic change to deliver safe, efficient, satisfaction, and equitable outcomes to its citizens. Both the National Coalition on Health Care (*Building a Better Health Care System; Specifications for Reform*, 2004) and the IOM (Committee on Quality Health Care in America, 2001; Committee on Quality Health Care in America, 2000) voiced a common theme that health care reform was a high national priority and that the current outcomes of increased costs, errors, delays, and dissatisfaction were unacceptable.

Among other maladies, the system currently suffers from fragmentation and lack of coordination. This fragmentation contributes to the current outcomes, antithetical to those desired. The IOM in its third report *Keeping Patients Safe; Transforming the Work Environment of Nurse* (Committee on the Work Environment for Nurses and Patient Safety, 2004) advised leaders to promote a collaborative environment among its multidisciplinary staff members or, in this researcher's diction, a culture of teamwork to foster the required system transformation. Teamwork is expressed by such behaviors as effective communication. The use of SBAR might improve the communication

between caregivers of various disciplines. Improvement of communication also might improve the teamwork. In the next section, the researcher broadly investigates the variables of organizational culture and relates these variables to the health care organizational change.

Variables of Organizational Culture

In this section the concept of organizational culture is explored broadly in three aspects related to this research: (a) the development and significance of subcultures; (b) person-culture fit and employee satisfaction, and (c) organizational culture characteristics and performance. The first three studies (Davidson, Shofield, & Stocks, 2001; Langan-Fox & Tan, 1997; Silvester, Anderson, & Patterson, 1999) frame the initial aspect, the development and significance of subcultures within the organization. The fourth study (O'Reilly, Chatman, & Caldwell, 1991) investigates the relationship between organizational fit, an individual's congruency of personal values with organizational ones, with employee satisfaction outcomes. The fifth study (Rousseau, 1990) assesses the relationship between characteristics of culture and the performance outcomes of the culture.

The Development and Significance of Subcultures

Davidson, Schofield, and Stocks (2001) reported a case study, which considered the subsets of cultures in an urban public school system implementing the Internet. Prior to acknowledgement and adaptation of processes, differences between the technical professional and educator subcultures resulted in conflicts. Davidson et al. (2001) collected and triangulated data from observations, interviews, and email data during 18 months of the project implementation. To analyze the data, the researchers

coded each data source, conducted constant comparative analysis and identified thematic categories.

Davidson et al. (2001) reported several subcultures contrasts, which contributed to conflict: (a) Teacher routines were structured; the technical staff routine was marked by variability and flexibility; (b) the teachers valued pragmatism; the technical staff valued innovation; and (c) the project teachers and technical staff differed in their technology orientation. Davidson et al. (2001) identified the actions which decreased subculture conflict and increased collaboration: (a) The school system hired a new technical staff person and located the person in the midst of the teachers, and (b) the new employee, experienced with non-technical persons, served in a quasi liaison role linking the technical department and the teachers. Davidson et al. (2001) explained that the project administrators had not planned to improve collaboration between the subculture members prior to the project implementation. The study implications for this research relate to workers of like training and value systems aligning into subcultures, which conflict during organizational change. Subsequently, this researcher presents evidence that nurses, physicians, and ancillary personnel comprise separate subcultures within the broader hospital and unit cultures. To succeed, a change initiative plan, which includes an SBAR implementation plan, must address subculture constructs.

Silvester, Anderson, and Patterson (1999) conducted an exploratory case study of the manager, trainer, and trainee subcultures in a multinational corporation. The corporation implemented the methods and culture of Total Quality Management (TQM) through staff education of statistical and problem solving methods and the establishment of interdisciplinary process improvement teams. The purpose was to

explore similarities and differences in the belief patterns related to acceptance or rejection of the TQM initiative.

Silvester et al. (1999) gathered their data in interviews representing the subcultures of managers, trainers, and trainees. One researcher interviewed these stakeholders, characterized as a representative sample, in one-hour semi-structured individual interviews ($N = 22$): (a) four senior managers, charged with the strategic plan of the change program, (b) 11 trainers, who had input into the training modules, and (c) 7 trainees, randomly sampled engineers from various departments. The researchers recorded the interviews.

To analyze the data, Silvester et al. (1999) employed the methodology attributional analysis, which utilizes “the identification, extraction and coding of spoken attributions produced during semi-structured interviews by individuals from key stakeholder groups in the culture-change program” (p. 2). Silvester et al. (1999) explained: “. . . in terms of organizational culture, spoken attributions represent an ideal focus for exploring the extent to which causal attributions are shared by members of a particular group” (p. 4). The researchers submitted that the quantification of attributional patterns illustrated a method of identifying shared causal beliefs of successful and unsuccessful change initiatives. Silvester et al. (1999) analyzed the responses in three stages. In the first stage of the attributional analysis, the researchers extracted 1230 spoken causal attributions from the transcripts. They identified the attributions according to the 1993 definition of Joseph, Brewin, Yule and Williams (as cited in Silvester et al., 1999):

Those statements identifying a factor or factors that contributed to a given outcome” and where “a stated or implied causal had to be present.” Examples

include “by cooperating with each other and bringing together all the appropriate skills, we end up with a good product The program is effective because it gets the engineers to really think in a structured way about a problem and identify root causes. (p. 6)

In the second stage of the analysis, Silvester et al. (1999) categorized each attribution as representing an agent or a target. An *agent* was viewed as representing the individual or the group instrumental in causing change or bringing about the outcome of the attribution. The *target* was a group or person acted upon by the agent. The researchers cited the coding example: ““Going to the program modules has made me rethink the way I plan my team meetings’ agent would be coded ‘the programme’ as agent and target would be ‘self’” (p. 6).

Using the Leeds Attributional Coding System in the analysis third stage, Silvester et al. (1999) coded and classified each attribution on each of four causal dimensions: (a) stable-unstable, (b) global-specific, (c) internal-external, and (d) controllable-uncontrollable. They also classified the attributes as positive-negative and actual-hypothetical outcomes. To ensure the analysis reliability, researchers completed coding reliability studies on the various coders. They also conducted intercorrelation studies for all coding dimensions. The investigators considered the following correlations to be noteworthy: the correlation between internal-for-agent and internal-for-target ($r = .26, p < .001$) and between global and culture ($r = .20, p < .001$).

Silvester et al. (1999) reported that the three groups of managers, trainers, and trainees generated approximately the same average of attributions per person: The managers produced 206 attributions, trainers produced 571 attributions, and the trainees produced 453 attributions. The trainees produced a significantly larger proportion of positive attributions than either of the two groups “($\chi^2, p < .001$)” (Silvester et al., 1999,

p. 9); the managers and trainers made the larger percentage of negative-actual attributions.

The researchers also developed “cognitive maps” through studying the inter-group differences with a series of inter-correlation matrices and computation of the Pearson’s *r* within groups. The researchers correlated each group’s attributional codings across the six categories of change, global, culture, quality, internal, and stable. They examined the associations of these constructs from the interviewee attribution statements. Managers, trainers, and trainees held similar perceptions at an intra-group level. When the researchers combined these results into a composite organizational sample, they identified few significant correlations. Silvester et al. (1999) compared each respective group’s “cognitive map,” which differed in relationship among dimensions. The researchers interpreted this difference as representing the different perception of change. Each group demonstrated a commonality in exerting limited influence over the change process.

Silvester et al. (1999) reported four primary findings: (a) The groups agreed that the initiative would produce future positive outcomes; (b) trainees made a significantly higher proportionate of positive attributions than the other two stakeholder groups; (c) trainers had significantly more negative future-based outcome attributions than the other two stakeholder groups; and (d) cognitive maps illustrating conceptual relations between dimensions differed markedly between the three interviewed groups. This study again considers the differing subculture perceptions of change initiative progress. Presented in the hierarchical order of senior manager, trainer, and trainee, the trainee had the most positive opinion of the organizational change.

Similar to the study by Silvester et al. (1999), Langan-Fox and Tan (1997) conducted a qualitative study with a survey to assess a government business unit transition to a quality service culture. The study purpose was to evaluate the effectiveness of the repertory grid (Rep Grid) technique to describe a cultural transition. Langan-Fox and Tan (1997) did not fully define or explain the Rep Grid technique. The researchers, however, explicated the technique by identifying its advantages: (a) The Rep Grid provides a useful structure to elicit norms, behavior, and assumptions of a culture through the use of different concrete examples; (b) its use minimizes research bias; (c) the construct extraction process fosters researcher probes; and (d) the Rep Grid, by providing structure and focus, decreases unproductive interviews. As a secondary purpose, they also conducted an audit on the culture change process of the described business unit.

Langan-Fox and Tan (1997) devised a two-stage investigation method using both qualitative and quantitative methodologies. In the first qualitative stage, the researchers identified basic cultural assumptions and values of middle managers through in-depth interviews ($n = 13$). The majority of the sample, comprised of ten males and three females, had been employed by the organization for at least seven years. In this stage, Langan-Fox and Tan (1997) described their use of the Rep Grid process:

To obtain comprehensiveness in the culture constructs elicited in the interviews, a cross-section of elements was chosen for the Rep Grid exercise. The cross-section included (a) the unit and other parts of the organization, (b) staff, middle managers and senior management, (c) members who are *typical* (i.e., those who are perceived by middle managers to subscribe to the old culture, or possibly to the new culture, depending on which culture the interviewee considered as more pervasive, widespread or typical) and (d) members who are *atypical* (i.e., those

who are perceived by middle managers to subscribe to the other culture). (p. 278)

In these interviews ($n = 13$), the Langan-Fox and Tan (1997) used the Rep Grid process to elicit the organizational culture component by comparing different groups of workers. The researchers analyzed the interviews through content analysis, which they described by referencing Jankowicz: “as offering a compromise between imposing a conventional questionnaire format of constructs of interest to the author (and senior management), and the retention of individual meaning available in single elicited construct grids” (Langan-Fox & Tan, 1997, p. 279). From this process the themes emerged, which contrasted the old culture and the desired new culture: motivation, customer orientation, industry context, work orientation, and people orientation.

Langan-Fox and Tan (1997) concluded that deficits existed among the elicited constructs: definitions of quality from a customer’s perspectives, excellent service delivery, and high performance service standards. The researchers also reported a reoccurring theme in the interviews: A bus metaphor, interpreted as an indication of cultural transition, was a description of worker support for the new culture. Managers described other managers and workers according to their responses to the culture change: (a) Staff and management who had adopted the behaviors, assumptions, and attitudes representative of the intended service culture were categorized as “on the bus”; (b) members who appeared to be transitioning toward full adoption were described as “having one foot on the bus”; and (c) members who were averse to adopting the new culture norms were described as “those who are not on the bus” (p. 280). The researchers noted that the emphasis of the metaphor was on the physical presence on a

stationery bus, symbolizing acceptance of the culture change, and not on the journey, symbolizing the objectives of the quality service initiative.

In stage two of the study, Langan-Fox and Tan (1997) developed and conducted a survey, using information constructs elicited in the interviews. The researchers hypothesized that the survey mean scores of perceptions of the senior management, middle management, and worker subcultures would be statistically different. They also predicted that middle managers would perceive that the proportion of staff aligning to the former culture would be greater than the proportion adhering to the established new culture.

To test these hypotheses, the researchers developed two surveys for middle managers, based on their interviews with middle management. They did not report reliability analysis for either survey. Following content analysis of their stage one interviews with middle management, the researchers categorized all employees and management into the three culture groups of senior management ($n = 7$), middle management ($n = 12$), and workers ($n = 400$). One survey for middle management assessed the manager perceptions of the unit culture; the other gathered demographic data on the sample. The main survey questionnaire was comprised of 63 items, by which respondents rated the characteristics of the three culture groups representing people who embraced the new culture, those who were ambivalent and somewhat neutral, and those who actively resisted the new culture (response rate = 92%). On the second survey, the middle managers gave their opinions on the extent the subcultures of senior managers, middle managers, and staff workers had adopted the culture (response rate = 100%).

To test the first hypothesis, Langan-Fox and Tan (1997) performed a series of individual one-way analysis of variance (ANOVA) of repeated measures design on the means of the respondent evaluations of the three culture groups. These ANOVAs established that statistically significant differences between group means existed ($p < .05$) for 57 of the 63 items. Hypothesis one was supported.

To test hypothesis two, Langan-Fox and Tan (1997) performed t tests. They reported that hypothesis two was not supported but that the opposite was true: A significantly greater proportion of middle managers perceived that staff members were moving to the new culture than resisting the new culture ($t = 4.51, p < .01$). The researchers did not report t - test degrees of freedom. Langan-Fox and Tan (1997) identified the study limitations: (a) the restriction of their survey sample exclusively to middle managers, and (b) the brief time duration between culture change process and surveying. The study again demonstrated that various subculture perceptions of cultural transformation vary significantly. This researcher submits that health care subcultures also consider the advent and progress of culture change initiatives quite differently and that the implementation plan of a successful change initiative addresses this variance (Davidson et al., 2001).

Person-Culture Fit and Employee Satisfaction

In their correlational study, O'Reilly et al.(1991) examined the congruency of individual values with the organization cultural values. The researchers posited that the study purpose was fourfold: to develop the instrument, to complete validity studies on the Organizational Culture Profile (OCP), to examine the person-culture fit, and to examine the associations of person-culture fit with individual commitment, satisfaction,

and longevity within the organization. The researchers described preliminary testing of the OCP to create profiles in eight accounting firms; they affirmed its reliability: “The eight profiles showed substantial reliability, with an average alpha of .88, representing a range of .84 to .90, indicating relatively high levels of agreement among the raters in each firm” (p. 495). O’Reilly (1991) hypothesized that high levels of person-culture fit would be positively associated with individual commitment, satisfaction, and longevity within organization.

O’Reilly et al. (1991) explained that the sample to further develop and test the OCP was comprised of five groups. The five groups were diverse in experience and in their study participation. The first group ($n = 131$) was comprised of 131 volunteer MBA students at a western university. This group completed the OCP to assess their preferences for organization values and provided substantial personality data through their completion of the Adjective Check List, a personality inventory. The researchers aggregated these group responses with other groups to assess the structure of individual preferences for organizational values and to investigate the association between personality and organizational culture preferences.

The researchers (O’Reilly et al., 1991) reported that the second group members were MBA students ($n = 93$) at a Midwestern university. They provided OCP data on individual culture preferences. The researchers combined this group with the others to assess the structure of individual preferences. O’Reilly et al. (1991) declared that the third group ($n = 171$) was part of a longitudinal study that followed new accountants from their job entry through two years post-orientation in eight of the largest U.S. public accounting firms. These individuals completed the OCP and provided data on

their preferences. The researchers also surveyed this population one year post-orientation on their job satisfaction, organizational commitment and intent to leave. The researchers combined the OCP responses from the third group with those obtained from the first two groups to measure the structure of individual preferences for organizational values. The researchers also correlated the individual OCP data with firm-level measures of corporate culture obtained from the fourth group to provide a measure of person-culture fit. The fit score was associated with the outcome variables of job satisfaction, commitment, intent to leave, and turnover. The researchers also obtained data from 128 senior accountants, who were employed by the same eight firms as the new accountants. Approximately eighteen senior accountants, representing each of the eight firms, completed the OCP. The researchers developed an overall profile of the each firm culture by averaging the individual responses. O'Reilly et al. (1991) explained that the fourth group was comprised of certified public accountants ($n = 96$) from six offices of major accounting firms, located in the West Central United States. This group provided assessments of their company culture. The researchers aggregated data from Group 4 and Group 5 to analyze the structure of OCP descriptions of company cultures. Group 5 was comprised of governmental agency mid-level managers ($n = 73$), who also completed the OCP.

O'Reilly et al. (1991) developed the OCP, which assessed the culture. The OCP contained 54 value statements that identify individual and organizational values. The researchers instructed respondents to sort the 54 items into nine categories ranging from most to least desirable or from most to least characteristic. The researchers employed a variation of the Spearman-Brown general prophecy formula to investigate the

intercorrelation among raters. The researchers submitted that the OCP showed “good internal and test-retest reliability” (p. 499).

The researchers also conducted validity studies on the OCP. The researchers conducted a separate factor analyses of the individual and organizational profiles to examine the discriminate validity of the OCP. They analyzed the sorting data of the groups 1, 2, and 3 by using principal components analysis with varimax rotation ($n = 395$). They also conducted a scree test on the data. The researchers reported that eight interpretable factors with eigenvalues greater than 1.0 emerged: (a) attention to detail, (b) orientation toward outcomes or results, (c) aggressiveness and competitiveness, (d) supportiveness, (e) emphasis on growth and rewards, (f) a collaborative and team orientation, and (f) decisiveness.

O’Reilly et al. (1991) used a West Coast MBA student sample ($n = 131$) to investigate whether different types of individuals reported culture preferences on the various dimensions. They correlated these scores with a measure of personality, the Adjective Check List. To study whether the individual and organizational matrices were similar, the researchers asked respondents from Group 4 and Group 5, the government agency, and the six accounting firms ($n = 826$) to sort 54 characteristics into nine categories based on the extent to which each trait categorized the organization culture, rather than personal preferences. Again the researchers performed a principal components analysis and varimax rotation using these data.

O’Reilly et al. (1991) also assessed the following variables: person-organization fit, organizational commitment, job satisfaction, intent to leave, turnover, and control variables. The researchers assessed the person-organization fit primarily with the third

group of the sample. Both the new accountants and the senior accountants in Group 3 sorted the firm characteristics. Using these characteristics, the researchers developed a culture profile of each firm. The researchers calculated the organizational fit by correlating the beginning accountant rankings on the 54 items with the rankings of the senior managers. The person-organization fit correlations ranged from ($r = -.36$) to ($r = +.52$).

O'Reilly et al. (1991) also appraised organizational commitment with the O'Reilly and Chatman's 12-item score. The researchers, who did not cite the analysis values, reported that a principal components analysis with a varimax rotation yielded two factors: normative commitment and instrumental commitment. The construct of normative commitment, commitment based on an acceptance of the organizational values, is assessed in eight questions. The second factor instrumental commitment, a description of commitment in response to specific rewards, is assessed in four questions. The researchers calculated separate factor scores for normative and instrumental commitment. The researcher cited no other scale validity or reliability information.

O'Reilly et al. (1991) appraised overall job satisfaction with a single-item Faces Scale. While the researchers cited authors Brief and Roberson (1989) as supporting the scale credibility, O'Reilly et al. (1991) gave no actual data on validity or reliability. O'Reilly et al. (1991) examined intent to leave an organization with four Likert-type scale questions: (a) "To what extent would you prefer another more ideal job than the one you now work in?"; (b) "to what extent have you thought seriously about changing organizations since beginning to work here?"; (c) "how long do you intend to remain

with this organization?"; and (d) "if you have your own way, will you be working for this organization three years from now?" (p. 499). The researchers calculated one factor score to measure intent to leave. O'Reilly et al. (1991) gave no other scale validity or reliability. O'Reilly et al. (1991) evaluated turnover one year after the administration of the second survey and two years after person-organization fit was measured. Leadership from each firm supplied a list of departed employees and their departure dates. The researchers reported that they used tenure with the firm, age, and gender as control variables.

Related to the OCP validity, the researchers (O'Reilly et al., 1991) found that the results of the factor analyses suggested that the OCP was an acceptable measurement of organizational culture. The researchers conducted a separate factor analysis of the individual and organizational profiles to examine the discriminate validity of the OCP. From the principal component analysis with varimax rotation and a scree test, the researchers reported that eight interpretable factors with eigenvalues greater than 1.0 and defined when at least three items emerged: (a) attention to detail (eigenvalue = 4.16); (b) orientation toward outcomes or results (eigenvalue = 3.11); (c) aggressiveness and competitiveness (eigenvalue = 2.33); (d) supportiveness (eigenvalue = 1.93); (e) emphasis on growth and rewards (eigenvalue = 1.73); (f) a collaborative and team orientation (eigenvalue = 1.61); and (g) decisiveness (eigenvalue = 1.49). To investigate whether the individual and organizational matrices were similar, the researchers performed a principal components analysis with varimax rotation scree test using this data. They retained items with loadings greater than .40. The researchers reported that five of the eight factors were replicated on both analyses: innovation,

outcome orientation, aggressiveness, detail orientation, and team orientation. The researchers concluded that the congruence between cultures as identified by individual preferences and actual organizational descriptions was acceptable.

O'Reilly et al. (1991) suggested that high person-organization fit at the initial time of employment is associated with high positive affect and a low intent to leave a year later. The researcher reported the correlations between personal fit and the outcomes of satisfaction, commitment, turnover, and the control variables: (a) between person-organization fit and commitment ($r = .25, p < .01$); (b) between person-organization fit and overall job satisfaction ($r = .35, p < .01$); and (c) between person-organization fit and intent to leave an organization ($r = -.37, p < .01$). Subsequent multiple regressions showed that person-organization fit is a significant predictor of normative commitment ($F = 2.62, p < .05$), job satisfaction ($F = 4.31, p < .01$), and intentions to leave ($F = 5.04, p < .05$). This relationship was independent of age, gender, and tenure. The researchers collected employment status data on all respondents one and two years following the initial data collection. They used survival analysis for the turnover research. O'Reilly et al. (1991) concluded that a person-organization fit positively predicted the employee staying with the firm.

The study establishes the importance of the congruence of an employee's values with those of his organization positively predicts employee satisfaction and employee retention. The culture and work environment of nurses (Committee on the Work Environment for Nurses and Patient Safety, 2004) is a source of nurse dissatisfaction. This researcher submits that nursing incongruence of the person-organization fit might be a factor of the nursing shortage, a national crisis previously noted. Subsequently,

this researcher presents studies which established that hospital cultures which emphasized collaboration and teamwork were positively related with nursing commitment, job involvement, empowerment, and job satisfaction and had a statistically negative relationship to intent-to-turnover (Gifford, Zammuto, & Goodman, 2002).

Organizational Culture Characteristics and Performance

Rousseau (1990) reported a correlational study of the relationship of organization culture beliefs to its organizational performance. Rousseau cited her prior research, which identified a set of normative beliefs: achievement, self-expression, cooperation, and affiliation. The researcher (1990) postulated that these norms were characteristic of a satisfaction- or team-oriented culture. The researcher stated four hypotheses: (a) Hypothesis 1: Organization performance would be correlated positively with team or satisfaction-oriented norms; (b) Hypothesis 2: Security-oriented norms would be negatively related associated with performance; (c) Hypothesis 3: Security-oriented norms would be negatively associated with individual attitudes; and (d) Hypothesis 4: Satisfaction-oriented norms would be positively associated with individual attitudes. At the organization level, the dependent variable was performance; at the individual level, the dependent variable was the staff associate response.

Rousseau (1990) selected a sample of 32 American voluntary service organizations, which had raised the highest dollar amount annually, adjusted for community wealth. To measure the norms, Rousseau (1990) gave the organization chief professional officers (CPO) 10 copies of the Organizational Culture Inventory

(OCI) to distribute to permanent staff members. With a response rate of 82%, 263 staff members returned complete surveys.

Rousseau (1990) described the OCI as a measure of twelve normative beliefs reflecting two dimensions: (a) task versus people identified by Black and Mouton, and (b) security versus satisfaction identified by Cooke and Rousseau (as cited in Rousseau, 1990). Patterns of these beliefs represented different organizational culture types: (a) A team-oriented satisfaction culture was established by achievement, self-expression, humanistic/helpful, affiliative characteristics, and (b) a security-oriented culture was established by people/security and task/security norms. The people/security norms emphasized control in interpersonal relationships: approval, conventional, dependent, and avoidance. The task/security factor included norms, which emphasized control in tasks: oppositional, power, competitive, and perfectionist. Cronbach's alpha of the subscales ranged from .75 to .92.

Rousseau (1990) analyzed the data for the first two hypotheses by aggregating the data of the individual normative beliefs at the unit level. An analysis of variance (ANOVA) established that the differences in mean OCI scores for all normative beliefs across units except approval were significant ($p < .05$). The researcher also computed the within-unit agreement: The calculation demonstrated a high degree of agreement of unit norms (from .13 to .37). The aggregation was appropriate due to strength of the with-in unit agreement.

Rousseau (1990) used Spearman's rank order correlation to test Hypotheses 1 and 2. The researcher utilized Pearson correlation at the individual level to test for Hypothesis 3 and Hypothesis 4. Rousseau (1990) reported that data and analysis did

not support Hypothesis 1: Organization performance would be correlated positively with team or satisfaction-oriented norms. Correlations between satisfaction-oriented norms were positive as predicted but were not statistically significant. Rousseau (1990) reported that the analysis supported Hypothesis 2: Security-oriented norms, including approval, conventional, and dependent, were negatively related to performance. The researcher reported that the Spearman correlation coefficients, relating computed aggregated behavior norms and the performance, found a significant and negative relationship between dollars raised and the people-security-oriented norms.

Rousseau (1990) reported that the analysis supported Hypothesis 3: Security-oriented norms were negatively associated with individual attitudes and Hypothesis 4: Satisfaction-oriented norms were positively associated with individual attitudes. Hypothesis 3 was supported by strong and positive correlation ($p < .001$) of satisfaction-oriented beliefs with role clarity, fit, satisfaction, commitment to stay and connection to the ongoing action of others. Security-oriented beliefs of approval, convention, dependence, oppositional, power, competitiveness, and perfectionism were positively correlated with role conflict and negatively correlated with member positive perceptions.

In the discussion section, Rousseau (1990) explained the failure to find a significant statistical relationship between team culture styles and performance was due to a restriction of range:

Reliance on centralized decision making, emphasis on conformity, and subjective criteria for assessing employee contribution are negatively related to performance There is no evidence in this research that normative belief promoting greater managerial control, intragroup competition, or hierarchical decision making (i.e., security orientation) benefit the organization or its members. Rather, these mechanisms are associated with poorer organizational

and member outcomes. In these not-for-profit organizations, results of this study clearly indicate that normative beliefs and performance are linked. (p. 458)

Rousseau (1990) established that a hierarchical culture produced “poorer organizational and member outcomes” (p. 458). A hierarchical culture is contrary to a collaborative culture; “poorer organizational . . . outcomes”(p. 458) are contrary to the outcomes demanded by the American public, the IOM, and National Coalition on Health Care. Cost, employee satisfaction, and patient satisfaction performance outcomes must be improved in a reformed healthcare system. This study is the first of many subsequent studies to link culture type or characteristics to performance outcomes.

Summary of the Variables of Organizational Culture

These studies consider various culture aspects, including conflict emanating from subcultures unprepared to collaborate, the experience of subcultures in two different culture change initiatives, and the relationship of culture types or characteristics to organizational outcomes. Davidson et al. (2001) established that subcultures representing different disciplines and perspectives contributed to conflict between the various groups. Integrating a liaison role between the two subcultures subsequently increased collaboration between the two groups. The existence of subcultures with different frames of reference is an important variable to consider when initiating organizational culture change (Langan-Fox & Tan, 1997; Silvester et al., 1999). The variable of subcultures is relevant to this research; this researcher recognizes that development of a collaborative culture is challenging when many health care providers, specialized in training and task, are organized into functional

departments, which become subcultures. For example, physicians, respiratory therapists, and nurses, who are not trained in universities to function as a team, often develop different subcultures in hospitals. These subcultures are fostered by separate organizational structures, such as disparate physician, respiratory therapy, and nurse unit lounges and separate parking areas.

The last two studies examined the norms and values of the culture. The fourth study by O'Reilly et al. (1991) established that a positive relationship existed between the congruency of individual values with the organization values and employee satisfaction outcomes and retention measures. The lack of congruency between nurse values and hospital values might be a variable in the nursing shortage crisis. Finally, Rousseau (1990) established the important link between the culture of an organization and its performance. Rousseau indicted cultures with certain properties as producing poor outcomes: "normative belief promoting greater managerial control, intragroup competition, or hierarchical decision making (i.e., security orientation) . . . are associated with poorer organizational and member outcomes" (p. 458). Such a cultural description is quite the opposite of the sanctioned collaborative norms and behaviors identified by IOM (Committee on the Work Environment for Nurses and Patient Safety, 2004). These collaborative behaviors include shared understanding of goals; shared decision making; inclusive, open and accepting attitudes of diverse opinions; and positive conflict resolution practices.

In the future, health care organizations must produce higher employee and customer satisfaction, increased safety, and improved clinical outcomes while containing and reducing costs. The relationship between organization culture

characteristics and performance outcomes has begun to emerge in the literature review:

(a) Congruency of person-organization fit is related to employee satisfaction and retention, and (b) cultures with hierarchical characteristics are linked with lower outcomes. The next section considers the cultures of health care organizations.

Organizational Culture and Performance of Health Care Organizations

In the study of organizational theory, health care organizations exhibit two organizational variables which define their cultures and influence their approaches to change: (a) Their work requires the synergy of many highly specialized workers who are rarely trained together (Baker, 2005), and (b) the workers often are segregated by their professional subcultures.

As health care organization leaders endeavored to meet challenges from the marketplace, regulatory agencies, and third party payers, they initiated a variety of formal organizational change initiatives to engender reforms in processes, care delivery systems, and technology. Generally, health care organizations have a history of these failed change initiatives and according to organization theorist Mintzberg, “remain prone to poor change implementation” (as cited in Committee on the Work Environment for Nurses and Patient Safety, 2004, p. 118). These programs, which encountered resistance, included implementation of quality improvement (QI) and reengineering (Shortell, Gillies, & Anderson, 1996).

Previously, the IOM and the National Coalition on Health Care asserted that the health care industry must reform. Understanding the assessed cultures of health care organizations is obligatory prior to positing or implementing change. In this section, studies limited to various health care settings are presented. The following subsections

comprise this section: (a) assessment of health care culture, (b) organization redesigns/major changes and culture, and (c) relationship of organizational culture to performance outcome measures.

Assessment of Health Care Culture

The assessment of health care culture will be discussed in two subsections: (a) global assessment of health care culture and (b) assessment of three specific health care cultures.

Global Assessment of Health Care Culture

Previously, this researcher presented three IOM reports, which demanded reform (Committee on Quality Health Care in America, 2000 & 2001; Committee on the Work Environment for Nurses and Patient Safety, 2004). This call for reform followed an assessment of the health care system by eminent health care researchers Shortell, Gillies, Anderson, Erickson, and Mitchell (1996) who published *Remaking Health Care in America: Building Organized Delivery System*, a seminal source for the three IOM reports. In the report of a four-year study of American health care systems, Shortell et al. (1996) indicted the U.S. health system for being unnecessarily fragmented, overspecialized, and resistant to change. The fragmentation was the result of incomplete information and communication, conflicting incentives, and organizational and professional biases. The primary challenge was to overcome fragmentation in a variety of processes, relationships, and organizational infrastructure.

To reform the system, Shortell et al. (1996) proposed the creation of a team culture, development of flexible organizational structures, investment in information systems, and implementation of incentives. These improvements would integrate the

system, decreasing the fragmentation. The researchers defined *integration* (as cited in *Webster's Dictionary*, 1990) as the process by which activities are formed, coordinated, or blended into a functioning or unified whole. The researchers addressed integration in three areas: (a) functional integration, (b) physician-system integration, and (c) clinical integration. According to Shortell et al. (1996), functional integration was the extent to which such key support functions as human resources were coordinated across a system so as to optimize the system. The researchers assessed physician-system integration as the extent of economic linkage physicians had to the system, the extent of physician facility use, and the extent of physician involvement in system planning, management, and governance. Clinical integration was the extent to which patient services were coordinated across people, activities, processes, departments, and operating units so as to optimize the services delivered.

To define the needed reforms of the health care system, Shortell et al. (1996) examined eleven health care delivery systems over a one- to four-year duration. Thirty-five systems met five criteria for study inclusion: (a) ownership of four entities currently operating; (b) some served a focused area; others served more than one area; (c) systems were established well and viable; (d) stable leadership committed to a study lasting multiple years; and (e) geographic representation in the United States. From these 35 systems, the researchers selected a purposive sample. The selection criteria were not correlated with degree of integration. Rather, the study systems recognized the growing importance of integration and were committed to learning more about the phenomenon.

Shortell et al. (1996) reported study participants: (a) Baylor Health System, Dallas, Texas; (b) EHS Health Care, Oakbrook, Illinois; (c) Fairview Hospital and Health Care Services, Minneapolis-St. Paul, Minnesota; (d) Franciscan Health System, Aston, Pennsylvania; (e) Henry Ford Health System, Detroit, Michigan; (f) Mercy Health Services, Farmington Hills, Michigan; (g) Sentara Health System, Norfolk, Virginia; (h) Sharp HealthCare, San Diego, California; (i) Sisters of Providence Health System, Seattle, Washington; (j) Sutter Health, Sacramento, California; and (k) UniHealth, Burbank, California.

Shortell et al. (1996) conducted numerous questionnaires, interviews, observations, and document reviews at each of the study participant organizations over the four-year study duration. [The reader may review Resource B, a seven-page appendix for the enumeration of data collection methods and analyses (Shortell et al, 1996).] The researchers explained that they reported the most important findings in addition to the descriptive data on the functional, physician-system, and clinical integration. They disclosed “that examination of the relationship is limited to bivariate Spearman rank correlation. Only correlations that were significant at the 0.05 level were discussed, and most correlations generally ranged from 0.50 to 0.90 in magnitude” (p. 56).

The researchers reported the following significant findings: (a) “The greater the number of hospitals in a system, the higher the perceived level of overall functional integration” (p. 62); (b) systems with high perceived integration of their cultures tended to have higher perceived functional integration; (c) a positive relationship existed between clinical integration and standardization; (d) physician-system integration was

strongly associated with clinical integration; and (e) an unwillingness of some of the operating units, especially high cash generating units, to join in the system integration was a major barrier to integration.

In relating the study (Shortell et al., 1996) to this research, the researcher notes that Shortell et al. (1996) emphasized the excessive fragmentation and resistance to change of the American health system. To reform these qualities, Shortell et al. (1996) emphasized the establishment of a collaborative culture and the development of responsive structures.

Ulrich, Buerhaus, Donelan, Norman, and Dittus (2005) conducted a national nursing survey, which measured attitudes related to the culture and collaborative working relationships. Spurred by the national nursing shortage in 2002, the officials at NurseWeek Publishing and American Organization of Nurse Executives (AONE) collaborated to conduct an earlier study. The researchers replicated the former survey to determine registered nurse (RN) views of their work environment and to compare the results of the 2002 and 2004 surveys. The researchers did not identify any survey reliability or validity measures.

The researchers (Ulrich et al., 2005) offered a choice of survey administration: a written questionnaire or electronic completion on the internet. The researchers explained that the sample consisted of 3,500 RNs, randomly selected from a national database of RNs currently licensed in the United States. Of the sample, 3,392 nurses were eligible and returned 1,783 surveys for a 53% response rate. Ulrich et al. (2005) stated that the researchers weighted the data by age and region of the country using the demographic information from the 2000 national Sample Survey of the Population of

Registered Nurses. They analyzed the data with descriptive data and *t* tests to determine if the 2004 survey results had improved significantly from the 2002 results.

Relevant to this research are the findings from the survey Professional Practice category. In the 2004 survey RNs assessed their opportunities to impact decisions about workplace organization and patient care. Only 19% rated the opportunities to impact decisions about their work place as *excellent* or *very good*; an additional 26% rated them as *good*. Fifty-five percent rated opportunities to influence the work environment as *fair* or *poor*. An increased percentage reported that they had opportunities to influence patient care: Only 26% rated their opportunities as *excellent* or *very good*, 32% assessed their opportunities as *good*, and 40% rated their opportunities were only *fair* or *poor*. The researchers did not refer to these scores from the first survey.

Ulrich et al. (2005) reported the Work Relationships category data. The RNs rated the quality of relationships among nurses and among nurses and physicians and other health care providers. The RNs rated the relationships among nurses as the highest of all relationships: Seventy-one percent of the responding nurses rated relationships among nurses as *excellent* or *very good*. The authors noted that this score was considerably improved over the prior study. In the 2002 study, 54% of respondents rated the relationships among nurses as being *excellent* or *very good*. Ulrich et al. (2005) reported that nurses assessed the relationship between nurse and physicians in the following categories and proportions: *excellent* by 11%, *very good* by 34%, *good* by 34%, *fair* by 16%, and *poor* by 2%. RNs who reported being more satisfied were more likely to evaluate nurse/physician relationships as *excellent* or *very good* ($p < .05$) Also

nurses in ambulatory setting were more likely than nurses in other settings to rate the relationships as *excellent* ($p < .05$).

Ulrich et al. (2005) reported that relationships among nurses improved markedly since the 2002 survey. The relationship improved to a lesser extent between nurses and physicians. Even though progress was evident, the authors identified improvement opportunities: “The goal now must be to continue this trend of improved relationships and to assure that collaboration becomes a consistent characteristic of practice environments” (p. 394). With 40% of the nurse respondents rating their opportunities to influence patient care as only *fair* or *poor*, the study establishes that nurses generally did not describe their core process of patient care as collaborative. Additionally, this researcher, through application of the positive relationship of person-culture fit with individual commitment, satisfaction, and longevity (O’Reilly et al., 1991), submits that this lack of collaboration is an important variable in the nursing shortage.

Assessment of Three Specific Health Care Cultures

Wooten and Crane (2003) reported a mixed design study in which they studied the role of midwives in establishing a constructive, teamwork culture. The researchers cited Cooke and Rousseau (1988) in describing constructive cultures as work settings where members have positive interactions and attain personal satisfaction and meet organizational goals. Wooten and Crane (2003) discussed their study in two phases: (a) Phase 1, a quantitative study and (b) Phase 2, a qualitative study.

Wooten and Crane (2003) explained that their sample was purposive. The University of Michigan Health System (UMHS) selected the sample; the initial UMHS

research purpose was to identify: (a) any areas with constructive cultures, and (b) the variables and forces establishing such cultures.

During Phase 1, the University of Michigan researchers administered the Organizational Culture Inventory (OCI), which measured values shared by the organization members. The values and norms contributed to dysfunctional organizational cultures or to constructive, high performing organizational cultures. The results of the OCI identified the certified-nurse midwifery practice within UMHS to possess the norms of a constructive culture. The practice also had a reputation for exceptional patient satisfaction and midwife job satisfaction.

In study Phase 2, Wooten and Crane (2003) conducted a case study on the UMHS certified-midwife practice and collected data from historical midwifery case data, semi-structured interviews, and observations. The researchers conducted the interviews with the midwives and a variety of stakeholders including obstetric patients, their birth coaches, physicians, and birthing clinic administrative directors. The researchers observed the practice members at staff meetings, during appointments with patients and staff, and at national conferences. Wooten and Crane (2003) did not explain their analysis of the data.

Wooten and Crane (2003) reported the findings. The demographic data showed that the practice provided prenatal, delivery, postpartum, and wellness gynecologic care. In 2002, the midwives delivered 546 babies and had a total of 7,355 clinic visits. Wooten and Crane (2003) identified strong affiliative and positive inter-personal relationships among the midwives. The researchers described supportive relationships with shared values of growth, development, and promotion of well being of each nurse.

They specifically stressed the evidence of teamwork and collaboration for patient care. The midwives conceptualized their fellow colleagues as partners and affirmed the diverse talents and experiences of the group. Collaboration was fostered by a social community connected by frequent meetings, e-mails, and face-to-face interactions. Wooten and Crane (2003) described a strong achievement orientation, which was evidenced in the strong group work ethic. Their achievement orientation was coupled with self-actualized behavior. The midwives in this practice truly enjoyed their work and felt that it was a *calling*.

Wooten and Crane (2003) also identified another cultural characteristic, intense dedication to their patients. The researchers categorized the patient feedback into four themes: (a) reliability, (b) responsiveness, (c) assurance, and (d) empathy. They noted that this constructive culture had been recognized with several awards and by a very positive growth rate from patient referrals. In summary, this department of midwives was high performing based on its customer satisfaction, customer growth, and awards. This sample asserted that teamwork and collaboration was an important aspect of their work to accomplish their goals. The assessment of the midwifery practice was important to this research because the group displayed and reported a highly collaborative culture of teamwork. The midwives perceived their colleagues as affirmed partners and valued the diversity of their experiences. The midwives, however, did not represent a group of multi-disciplinary workers.

Wilson, McCormack, and Ives (2005) conducted a qualitative study to fully understand the culture of a special care nursery in Australia. The special care nursery, a lower care level than intensive care, provided a high level of acute care for ill neonates.

The study site volunteered for inclusion in the study. The exclusively female sample included all unit nursing staff ($N = 27$). Their neonatal experience ranged from months to over 25 years. The majority were both registered nurses and midwives. The study methodology was based on Realistic Evaluation (RE) developed by Pawson and Tilley. The aim of RE was to evaluate the association between setting, process characteristics and outcome. The researchers collected the data in three ways: survey, observation, and interview.

Wilson et al. (2005) reported that the researchers administered a staff satisfaction survey developed by Traynor and Wade. The survey used a 4-point Likert-type scale. Wilson et al. (2005) noted that the survey had been previously validated at the health care organization. The Cronbach's alpha ranged from .86 to .93 for its various scales (as cited in Traynor, 1993). The researchers described the observation methodology by quoting Denzin as "observer as participant" (as cited in Wilson et al., 2005, p. 30). While observing direct patient care, they recorded the environment and interactions between nurses, the multi-disciplinary team, and the families. Wilson et al. (2005) conducted audiotaped, conversational style interviews of an hour of duration. The researchers formulated the questions from the conflicting analysis of the observations and survey results. In many questions, they explored the experience of working in a team.

From their comparative analyses of the transcribed interviews, the observations, and the field notes, Wilson et al. (2005) developed categories. From the categories, the researchers identified themes and developed a core variable. To increase the data trustworthiness, the researchers noted that an independent researcher examined the

theme refinement. The researchers analyzed the survey data by obtaining mean scores for each item. Higher mean scores, over three, indicated a positive response.

Wilson et al. (2005) reported the findings of four categories with underlying themes: (a) teamwork, (b) learning in practice, (c) inevitability of change, and (d) family-centered care. The relevant category of teamwork is most explicated in this review. The teamwork items survey results of 3.37 and 3.26 inferred that the special care nursery culture was a cohesive and supportive environment. This conclusion was not totally supported by the participant observation and interview data; the espoused values of the survey were not always the values in practice. The teamwork category themes included: (a) cooperation vs. individualism and (b) judgmental awareness vs. judgmental blindness. In reporting the cooperation vs. individualism theme, the authors noted that many of the data highlighted that staff members assessed their unit as a positive work place with many serious tensions.

Wilson et al. (2005) reported that negative nurse judgment of patients, families, or other staff was viewed as a destructive role to care provision and team dynamics. Staff members reported feeling undervalued because they were nurses rather than midwives. The staff expressed that they experienced these judgments as personal attacks. The nurses reported additional conflicted views, which the researchers identified with the theme, harmony vs. disharmony.

Relevant to this research, Wilson et al. (2005) concluded that exploring individual nurse perceptions of the unit environment, rather than relying solely on objective measures, enabled the identification of differences between the espoused and

practiced values. The researchers used this information to check assumptions about their beliefs and the culture with staff before proceeding to change the culture.

The studies in this subsection assessed the cultures in various healthcare settings: hospital systems, medical clinics, and inpatient hospital settings. Shortell et al. (1996) identified fragmentation as a deficit in major hospital systems and prescribed a more collaborative culture to improve this defect. In their national nurse survey, Ulrich et al. (2005) established that nurses believed that they could influence patient care decisions and improve nurse-physician collaboration. Wooten and Crane (2003) explained that a midwifery clinic staff credited collaboration as an important variable to a productive, constructive, high-performing culture. Wilson et al. (2005) demonstrated that simultaneously conducting qualitative and quantitative culture assessments achieved a more accurate cultural analysis than a singular approach.

The next section considers the role of organizational culture as a variable in various healthcare organizational redesigns and change initiatives.

Organization Redesigns/Major Changes and Culture

Smith, Francovich, and Gieselman (2000) conducted a pilot study to evaluate the value of an organizational culture model in a Veterans Affairs Medical Center (VAMC) medical clinic, involved in a major reimbursement procedures change. The independent variable was the organizational subculture to which the members belonged; the dependent variables were the member opinions about the reimbursement system. The researchers hypothesized that: (a) organizational subculture membership was significant and (b) member views about the new reimbursement systems were similar within the subcultures but were different from the member views of other subcultures.

In 1998, Schein (as cited in Smith et al., 2000) described an organizational culture model with three subcultures of operator culture, engineer culture, and the executive culture. These subcultures were particularly important when evaluating the dynamics of a major change. A change in any one of these subcultures could threaten the stability of the other subcultures, which might organize to defend its members against the change. The researchers applied Schein's subculture definitions to the following VAMC groups: (a) The operator culture, the front line people who delivered products or services, included the clinic staff, nurses, trainees, and faculty; (b) the engineer culture, the designers of processes which the operators used to deliver the products or services, included workers involved in meeting technical standards; and (c) the executive culture, the strategic and financial planners, represented higher-level management members.

Smith et al. (2000) embedded three questions about the new reimbursement changes within a survey. The questions (Smith et al., 2000) represented Schein's stated views of the respective subcultures: (a) "Increased workload is negatively affecting quality and satisfaction" (p. 72); (b) "guidelines and models are practical to use for daily activities in the clinic" (p. 73); and (c) "the VAMC devotes just the right amount of resources to support guidelines and models" (p. 74). Respondents responded to descriptors ranging from 1 (*strongly agree*) to 5 (*strongly disagree*). The researchers did not provide validity or reliability information regarding these three questions. The researchers also asked the respondents to explain their choices with rationale statements. Smith et al. (2000) distributed the questionnaire to the entire clinic staff,

residents, and administration and instructed respondents to identify themselves by organizational role. The response rate was 65% ($N = 60$).

Smith et al. (2000) analyzed the quantitative data with an analysis of variance by predicted group and the qualitative rationale statements with coding and inductive analysis through six iterations until themes were identified. The analysis of variance confirmed the researcher prediction of the arrangement of the *executive versus operator* responses and the *engineer versus operator* responses. Additionally, the *executive versus operator* and *engineer versus executive* showed statistical significant difference ($p < 0.001$). Qualitative analysis of the respondents' rationale statements supported the quantitative results. Each of the predicted cultures focused on the predicted critical variables: the *executive culture* produced 83% of the comments about cost, market share and efficiency; the *engineer culture* voiced 60% of the comments related to variability, capacity, and quality within guidelines, and the *operator culture* was responsible for eight or 100% of the comments related to stress and time pressures.

This health care study augments the description of subcultures and their disparate opinions earlier established in this research (Davidson, 2001; Langan-Fox & Tan, 1997; Silvester et al., 1999). For this researcher, who contemplates the implementation of a major change to physicians and nurses, the study supplements the resistance response: A change in one subculture may cause the others to defend members from change, especially if they perceive the change is mandated by an outside entity. This scenario makes the acquisition of change champions, subculture leaders who advocate the changes, within the subcultures imperative.

Jones, DeBaca, and Yarbrough (1997) conducted a quasi-experimental study on a Patient Focused Care (PFC) implementation 500-bed not-for-profit hospital. The study measured the independent variable effect of the PFC on the dependent variables, the change in cultural beliefs, assumptions, and theories regarding the hospital in two groups, nonmatched pilot units and control units. Jones et al. (1997) posited that “the PFC model represents a substantial change from the traditional structures, roles, and operations of health care organizations. Walls between disciplines and departments are removed, which can threaten deeply held professional norms and values” (p. 74). This particular PFC model redefined the traditional job categories of registered nurse, pharmacist, aide, transporter, and unit secretary into four roles of (a) clinical partner, who was a licensed clinical care giver, such as a registered nurse or pharmacist; (b) technical partner, who was either a licensed practical nurse, a nurse aide, or a physical therapy assistant; (c) service partner, who assumed the duties of transporting patients, cleaning rooms, and maintaining supplies; and (d) administrative partner, who served as a combined unit secretary and receptionist. Care pairs, who were assigned a few patients, gave such care as patient baths.

Jones et al. (1997) developed a survey based on Cameron and Quinn’s Competing Values Framework (CVF). The CVF assesses an organization culture as demonstration of four competing value systems: (a) clan culture, which is based on norms of affiliation, trust, and organizational commitment; (b) adhocracy culture, which stresses flexibility and individuality; (c) hierarchical culture, which emphasizes compliance on rules and bureaucracy; and (d) market culture, which stresses achievement and its reward.

Jones et al. (1997) designed their survey with belief statements, structured within six broad organizational categories: (a) “what the hospital is”; (b) “what holds the hospital together”; (c) “the hospital’s climate”; (d) “how the hospital defines success”; (e) “what the management style is”; and (f) “how the leadership is considered” (p. 76). In reference to these belief statements, the researchers (Jones et al., 1997) declared that “these are consistent with Quinn’s categories (Competing Values Framework) of dominant characteristics, institutional glue, institutional emphasis, criteria for success, management style, and institutional emphasis, criteria for success, management style, and institutional leader” (p. 76). Unlike the CVF scoring, this survey employed four descriptive statements under each category which respondents rated on a five-point Likert-type scale from 1 (*strongly disagree*) to 5 (*strongly agree*). To test the survey reliability, the researchers performed tests of internal consistency using Cronbach’s alpha on the questions grouped according to the CVF categories. Cronbach’s alpha of the survey was .94. The researchers surveyed all members of the two PFC pilot units and two control units four months prior to the PFC implementation and again six months post redesign implementation. The pre implementation survey return rate was 47% ($n = 260$). The post implementation survey rate was 51% ($n = 278$).

Jones et al. (1997) analyzed the data using analysis of variance (ANOVA) to compare the data across units and student *t*-tests to compare the data pre- and postimplementation. The researchers reported the same demographic characteristics in the two samples except that the post redesign sample was comprised of more RNs and fewer other professionals. Each group mean survey scores presented a mixed

perception of cultural values on the units at both the preimplementation administration (*Control 1*: Clan, $M = 18.7$; Adhocracy, $M = 20.1$; Hierarchy, $M = 19.8$; and Market, $M = 21.3$; *Control 2*: Clan, $M = 23.2$; Adhocracy, $M = 20.7$; Hierarchy, $M = 22.0$; and Market, $M = 20.4$; *Pilot 1*: Clan, $M = 21.7$; Adhocracy, $M = 21.5$; Hierarchy, $M = 21.0$; and Market, $M = 22.4$; and *Pilot 2*: Clan $M = 21.3^{**}$; Adhocracy, $M = 21.6$; Hierarchy, $M = 20.9$; and Market, $M = 20.3$; **** Significant $p < .001$ across units and * Significant $p < .01$ across time)** and postimplementation administration (*Control 1*: Clan, $M = 20.4$; Adhocracy, $M = 21.8^*$; Hierarchy, $M = 21.5$; and Market, $M = 21.3$; *Control 2*: Clan, $M = 21.4$; Adhocracy, $M = 21.7$; Hierarchy, $M = 20.4$; and Market, $M = 20.4$; *Pilot 1*: Clan, $M = 21.6$;

Rizzo, Gilman, and Mersman (1994) reported a qualitative study which utilized surveys for triangulation. Their case study described a process by which staff and management were involved in a patient care focused model (PFC) development, model implementation, and evaluation. In May 1992, the hospital formed a steering committee to plan and oversee the redesign. This PFC delivery model featured cross-trained care partners involved in clinical, technical, service, and administrative work. Care partners completed such traditional tasks as serving meals, cleaning the room, answering call lights, and giving baths.

Because the steering committee learned that hospital culture and unit subculture were important change variables, the committee consulted culture researchers Coeling and Simms (as cited in Rizzo et al., 1994). Coeling and Simms advised the administration of the Nursing Unit Cultural Assessment Tool (NUCAT-2). The NUCAT-2, which Coeling & Simms developed in 1993 (as cited in Rizzo et al., 1994),

was comprised of a four-point Likert-type scale ranging from 1 (*not at all*) to 4 (*extremely*). The assessment tool of 50 cultural behaviors measured actions, important to nurses and unique to units. Coeling & Simms in 1993 and Coeling and Wilcox in 1988 demonstrated the validity of the NUCAT-2 (as cited in Rizzo et al., 1994). To understand staff views, the steering committee members also administered the Work Characteristics Instrument. The Work Characteristics Instrument, employing a 4-point Likert-type scale from 1 (*not at all*) to 4 (*very*), measured staff member attitudes about the exciting, frustrating, and rewarding components of their work. Rizzo et al. (1994) reported that the Cronbach's alpha reliability coefficients of the Work Characteristics Instrument ranged from 0.92 to 0.93.

Rizzo et al. (1994) reported that 75% of the nursing department staff members from 13 units completed the NUCAT-2 and the Work Characteristics Instrument ($N = 235$). Rizzo et al. (1994) analyzed the NUCAT-2 results with guidance from Coeling and Simms, who had advised that behaviors important to the unit would have means greater than 2.7 and less than 2.3. The researchers did not cite the values received from the NUCAT-2 administration. From their analysis, the leaders discerned that the new model stressed individual accountability, inherent in the newly designed role of the care coordinator, but that the culture affirmed group accountability.

The researchers analyzed the Work Characteristics Instrument through correlation and explained that staff correlated "aspects of work related to work excitement" (p. 36): (a) seeing patients improve ($r = 0.50$); (b) viewed as part of the team ($r = 0.59$); (c) respected for added knowledge ($r = 0.65$); (d) working with people vs. machines ($r = 0.52$); (e) rewarding work ($r = 0.53$); (f) stimulating environment ($r =$

0.69); (g) interesting and exciting work ($r = 0.60$); (h) patient and family contact ($r = 0.55$); (i) accountability and responsibility ($r = 0.52$); (j) interest in specialty ($r = 0.51$); and (k) opportunities to work with other specialties ($r = 0.60$). Leaders used this information to identify and incorporate elements, which promoted work excitement and teambuilding, into their redesign (Rizzo et al., 1994).

Rizzo et al. (1994) described one-year post implementation on the orthopedic unit, the first unit to implement the change. All monitors, including patient satisfaction at the 90th percentile in a nationally recognized database, showed improved or stable scores when compared to the previous year. The researchers concluded that through their utilization of unique unit subculture knowledge the redesign was a success. For this researcher, the study reiterates the previously cited importance of subculture knowledge prior to change or redesign implementation (Davidson et al., 2001; Silvester et al., 1999; Langan-Fox & Tan, 1997; and Smith et al., 2000). SBAR is an implementation in which two subcultures, nurses and physicians, must change. Knowledge of the subcultures local to Community Hospital is necessary for successful implementation.

Ingersoll, Fisher, Ross, Soja, and Kidd (2001) conducted a qualitative study to measure the effect of patient-focused care (PFC) redesign on staff nurse perceptions of the work environment in two hospitals. These PFC designs, which redefined the nursing role, included the following elements: cross training of staff, decentralization of lab, radiology, and physical therapy service, reduction in the number of professional staff, and flattening of the administrative levels. Ingersoll et al. (2001) employed purposive sampling to invite all staff nurses from redesigned units to focus groups three

to six months postimplementation. Staff nurses ($N = 48$) attended focus groups of 45-90 minutes. Focus group questions were related to staff nurse responses describing the redesign effect on work group relationships, work environment, and provision of services to patients and families. The audiotapes were transcribed and reviewed by the participants for accuracy.

Ingersoll et al. (2001) used inductive analysis to review data, code for themes and compare the database for theme reoccurrence. The themes, related to social norms and values, which emerged from the data included: (a) high stress and low staff morale accompanied by feelings of despair, hostility, and grief; (b) role confusion and work disruption; (c) unit culture loss due to the immediate redesign and to dissatisfied informal leaders leaving; and (d) loss of a trusting relationship with administration.

Ingersoll et al. (2001) reported study limitations: (a) The postimplementation time frame of 3-6 months was too brief to record system acceptance, and (b) the perceptions came from a small sample ($N = 48$). The researchers recommended that future plans for such a culture change should address early culture support and development in redesigned units. This study and its antecedent (Rizzo et al., 1994) demonstrate the importance of conducting a preimplementation cultural assessment prior to implementing a major change. The knowledge gained should be utilized in planning the change.

Also employing the CVF questionnaire, Jones and Redman (2000) reported their case studies of major work redesign, a patient-focused care model in three hospitals. In Hospital One, the redesign most extensively modified the structure and care delivery: The hospital implemented multi-skilled workers, unit-based admitting, auxiliary testing

services, and streamlined clinical processes. To promote the change initiative, Hospital One instituted staff focus groups, transition management, and teambuilding. Prior to the redesign, the CVF profile was “balanced”; the average score of a possible 100 points per category were: (a) clan value of 20.3, (b) adhocracy value of 20.7, (c) hierarchy value of 20.5, (d) market value of 20.7 ($n = 236$). Following the implementation, the scores were: (a) clan value of 20.3, (b) adhocracy value of 21.8*, (c) hierarchy value of 20.0, (d) market value of 20.4 ($n = 265$; $p \leq 0.05^*$). A dependent *t*-test analysis established that the post implementation adhocracy value increases were statistically significant. Postimplementation Hospital One culture profile was more innovative and less dependent on rules and procedures. Patient satisfaction measures remained stable in the unmodified units and increased in the re-engineered units. Nursing satisfaction remained stable.

Jones and Redman (2000) reported that Hospital Two also adopted patient-focused care, but did not extensively re-engineer the patient care service delivery. The redesign involved 226 people representing all organization levels on vision and implementation teams. The redesign decreased the number of job categories and managers. Baseline CVF measurement demonstrated that the organization scored high on hierarchy and market values. The scores were: (a) clan value of 21.6, (b) adhocracy value of 20.2, (c) hierarchy value of 25.9, and (d) market value of 32.2 ($n = 505$). Following the implementation, the scores were: (a) clan value of 20.1, (b) adhocracy value of 18.4*, (c) hierarchy value of 25.4*, and (d) market value of 36* ($n = 304$). Following implementation the scores indicated a significant increase in the market value; the hierarchy value and adhocracy values showed significant declines ($p \leq 0.05$).

The dominant values demonstrated a control orientation. Following the work redesign, patient satisfaction remained stable. Nurses reported increased dissatisfaction, but the researchers did not report values. Jones and Redman (2000) analyzed Hospital Two findings: Hospital Two, located in a competitive and volatile environment, faced merger; charges were made that the redesign, financially motivated, had damaged patient care.

Hospital Three had the least extensive staffing mix redesign: This organization cross-trained unlicensed personal representing respiratory therapy, nursing environmental services, and dietary services. The Hospital Three strategy was to reduce delays for patients. This hospital redesign, unlike Hospitals Two and Three, was regarded as a nursing project rather than a hospital project. Prior to implementation, the scores were: (a) clan value of 15, (b) adhocracy value of 14, (c) hierarchy value of 24, and (d) market value of 31 ($n = 304$). Following the implementation, the scores were: (a) clan value of 16, (b) adhocracy value of 15, (c) hierarchy value of 29*, and (d) market value of 41* ($n = 260$, ; $p \leq 0.05^*$). Prior to implementation, the dominant organizational models were market and hierarchy; postimplementation the models strengthened. Hospital Three demonstrated a control orientation emphasizing competition and the bottom line. Following the redesign, job security and satisfaction with supervision declined significantly; patient satisfaction with nursing care declined significantly. Jones and Redman (2000) submitted that Hospital Three had the least redesigned, most nonadaptive cultural orientations, and most resistant employees. Because the redesign was identified with the nursing department rather than the hospital, fewer people worked to ensure its success. Staff members resisted the

redesign because they perceived its implementation as ordered by administration to the staff level with no feedback opportunities. Jones and Redman (2000) concluded the study: “These hospitals provide important insights about organizational culture as both an independent and dependent variable—in other words, how it affects initiatives and how it is affected by them” (p. 608). The study demonstrates that the most extensive reengineering of Hospital One, as compared to Hospital Three, resulted in significant change to produce a more creative and less hierarchical culture, which is dependent on rules. Unlike the hierarchical Hospital Two, Hospital One supplied feedback opportunities through staff focus groups, transition management, and teambuilding. These feedback structures, which foster understanding and change acceptance, will be featured in this research.

Marshall, Mannion, Nelson, and Davis (2003) conducted qualitative case studies of six primary care trusts of the National Health Service (NHS) reform in the United Kingdom. Trusts are the local administrative entity of the NHS; for example, a British primary care trust might be compared to a well-developed and medically staffed American health department. The study purposes included: (a) to explore the tension between the need for managers to produce quantifiable change and the abilities to create this cultural change and (b) to investigate how managers of primary care trusts dealt with this tension. For their purposive sample, Marshall et al. (2003) selected six primary care trusts, based on their emphasis on organizational change, different stages of organizational maturity, number of practices, and geographic and demographic considerations. The researchers conducted semi-structured interviews with managers ($N = 39$) of the six trusts; 19 of the interviewees were senior managers, and 20 were

middle managers. The structured interviews probed the interviewee perception of the term *culture*, perceptions regarding the particular cultural traits of the trusts, and the facilitators and barriers of the change initiative. All interviews were transcribed. The researchers assured trustworthiness of their interview data by triangulation with document reviews of annual governance and clinical reports.

Marshall et al. (2003) coded the data and completed constant comparative analysis, from which management styles and other themes emerged from the data. Marshall et al. (2003) interpreted the themes with the Competing Values Framework (CVF): (a) Managers, who identified existing clan trust values, perceived that the trusts would not be successful without incorporation of collaborative behaviors, reflective of a developmental culture. In a description of the development strategies for this culture, the manager characterized two distinct and contrasting management styles: (a) Directive style managers from the senior levels challenged the norms of clinicians; (b) facilitative managers from the middle management level attempted to bring change from within and often existed in clan cultures. These styles appeared to produce conflict between managers in five of the six primary care trusts. Marshall et al. (2003) suggested that development of primary care trusts was dependent on managers using a variety of management styles and strengths. The researchers suggested that managers with different styles who accepted other styles could produce collaboration. Without the acceptance and value of the other style, the differences often led to conflict.

Fulop, Protopsaltis, King, Allen, Hutchings, and Normand (2005) conducted a qualitative interpretive study of culture change in merged National Health System providers. The study purposes were: (a) to identify the drivers of merger in all nine trust

mergers in London and (b) to conduct four in-depth case studies three years post-merger. *Drivers of merger* were those forces supporting or promoting merger. Fulop et al. (2005) selected the sample purposively to ensure a variety of trust types and geographical location. The researchers collected their data in semistructured interviews ($N = 130$) and a document review. To establish trustworthiness, they analyzed public consultation documents for evidence of declared objectives. Four researchers read transcriptions and notes from interviews to ensure reliability. Through constant comparative analysis, they reached consensus on emergent themes, compared the cases, and synthesized findings.

Fulop et al. (2005) explained that the discussion of forces supporting merger was the context for the case studies. The researchers listed the following stated reasons for the mergers: cost saving, improved quality, and improved career prospects for staff. The unstated reasons included addressing managerial deficits, financial deficits, and local context. In the second part of the study, Fulop et al. (2005) summarized the four merger case studies, named Acute Trust, Mental Health Trust, Community Trust I and Community Trust II. A key theme was the experience of the merger as *a takeover*. Due to the resentment produced by the merger decision process, those interviewed in the studies reported limited knowledge and best practices sharing. Community Trust II appeared to have the most successful sharing, which might have resulted from this trust having a more collaborative staff, even prior to merger. Fulop et al. (2005) affirmed that another major theme was the emotional effect on staff, impacting the newly merged trust cultures. Staff at all levels reported that being overworked had negatively affected their personal lives. At the three-year postmerger interviews, the references to stress,

emotional upheavals, and takeovers had greatly decreased. This study suggested that mergers might be more successful, especially in the sharing of knowledge and best practices, when the staff is viewed as collaborative.

Jones (2003) conducted a correlational, descriptive study to measure the effects of a multihospital merger and restructuring on registered nurses (RNs) in medical-surgical units of newly merged acute care hospitals. Specifically, Jones sought to measure the effect of a hospital merger, the independent variable, upon the dependent variables, nurse commitment to their employer hospital, nurse commitment to the corporate entity of the merged hospitals, and the cultural changes. In 1982, Mowday, Steers, and Porter defined *organizational commitment* as “a state in which an individual identifies with an organization and its goals and norms and is highly motivated to remain engaged and work on its behalf” (as cited in Jones, 2003, p. 237).

Jones (2003) used two versions of the Mowday, Steers, and Porter Organizational Commitment Questionnaire (OCG) to measure the RN commitment. One version measured the commitment to the specific hospital, and the other version measured the commitment to the umbrella corporate system. The internal consistency of the OCG was a coefficient alpha of .90; the test-retest reliability was $r = .72$ after two months and $r = .62$ after three months (as cited in Mowday, Steers, & Porter, 1979). The researcher also conducted a focused organizational ethnography with semistructured interviews, document review, and observation to collect data which described the cultural changes spawned by the multihospital merger. Jones (2003) selected three hospitals approximately 3.5 years postmerger: Hospital A, an acquiring hospital; Hospital B, an acquired hospital; and Hospital C, an acquired hospital. She

sent questionnaires to all registered nurses (RNs) who provided care in the medical-surgical units of the three hospitals ($N = 98$; response rate = 31%) and conducted nine semistructured interviews with RNs. Jones (2003) analyzed the OCG sample data by means. She also conducted a paired t -test to assess difference in organizational commitment scores between each hospital and the corporate system. She also performed Pearson's correlations on the OCG scores for the individual hospital and the corporate system. Finally, she integrated the qualitative study results.

Jones (2003) reported that none of the nurses in the hospitals had a strong commitment to either the individual hospital or the corporate entity. No correlation existed between any of the demographic variables and either the hospital or the system. The researcher used the paired t tests to investigate the difference in organizational commitment scores between each hospital and the respective corporate system. The paired t test for Hospital A ($t = 4.67(61), p = .000$) and Hospital B ($t = 3.08(15), p = .008$) were statistically significant. Jones (2003) reported that Hospital B demonstrated the widest difference in the means between the organizational commitment to the hospital and commitment to the corporate system. The researcher also found significant positive correlations for commitment to the individual hospital and corporate system ($r = .769, p = .01$). The strongest correlation was found between organizational commitment by RNs to the hospital and the corporate system. The commitment at all three hospitals was significantly higher for their own hospital than to the corporate system. The interviews confirmed the quantitative analysis. Jones (2003) stressed that leaders must clearly demonstrate the values of the new culture and integrate them into all policies, procedures, and meetings. This study affirms the importance of

organizational leaders leading, modeling, and integrating a culture change rather than cooperating with a researcher as she leads the process for culture change. A requisite for organizational inclusion in this research will be leadership commitment to the stated behaviors.

Cohen, Kimmel, Benage, Hoang, Burroughs, and Roth (2004) conducted a mixed design study at Missouri Baptist Medical Center in St. Louis, Missouri. The qualitative case study purpose was to explicate a culture change intervention: Missouri Baptist Medical Center sought to become a culture focused on patient safety. The authors explained the organizational assessment process, the culture plan development, its implementation, and the culture change results. The study quantitative design determined if the culture intervention program had been successful. To measure the intervention impact, Cohen et al. (2004) used two specific measures of a safety culture: event-reporting rates and surveys of staff opinion.

Cohen et al. (2004) explained that the organizational assessment began with six focus groups, comprised of physicians, nursing staff, unit clerks, and pharmacy staff ($n = 68$). The group leaders explored participant attitudes toward safety, reporting errors to authority, and fears related to error reporting. Three themes emerged from the focus groups: (a) The existing error-reporting forms were time consuming and intimidating; (b) staff did not consider errors, which were discovered before they reached the patient, necessary to report; and (c) staff described the culture as punitive. The leaders decided to change the culture from one perceived to be punitive to a culture perceived to be *just*. To explain *just culture*, the researchers used Marx's definition: "one in which discipline occurs only for reckless behavior and where the individual

with repeated errors may need remediation or an organizational role change” (as cited in Cohen et al., 2004, p. 425).

Cohen et al. (2004) identified the three measures used to evaluate progress: an employee satisfaction survey, continuous, comprehensive tracking of all medical errors, and the harm caused to patients from medication errors. The researchers added two questions in June 2001 to an ongoing monthly employee satisfaction survey: (a) “This hospital has appropriate measures in place to protect patients’ medical safety” (p. 427); and (b) “This hospital provides an environment where staff can report medical errors and concerns without fear of negative consequences” (p. 427). From June 2001 until April 2002, the researchers longitudinally assessed the culture change of a stratified random sample ($n = 96$) using a six-point Likert-type scale survey (response rate = 36%). From May 2002 through March 2003, an average of 238 employees were surveyed monthly (average response rate = 34%). The researchers reported that the second measure was part of the Patient Safety Event Tracking System. As part of the system, all medical errors were tracked and recorded monthly on a spreadsheet.

Cohen et al. (2004) described the organizational leaders’ interventions: (a) unit safety rounds and the creation of a patient safety specialist position; (b) improvement of the reporting process, including simplified check box and anonymous reporting; (c) a new investigation process, utilizing the failure investigation tool of root cause analysis; (d) a team process to determine underlying subtle system problems and subsequent performance improvement teams; (e) a new proactive risk reduction process of failure mode and effects analysis; and (f) reward processes which reinforced the new safety culture.

Cohen et al. (2004) identified the three study periods: (a) baseline (January 2000-June 2001), (b) transition (July 2001-March 2002), and (c) postintervention (April 2002-March 2003). For the quantitative study the researchers employed the nonparametric Mann-Whitney U test to compare the responses to the two questions on the patient safety questionnaire. The researchers performed the nonparametric Kruskal-Wallis test to compare the rate of medical events per 1,000 days, the rate of medication events per 10,000 doses dispensed by the hospital pharmacy, and the number of phone calls to the hotline per 1,000 patient days measures over these three periods. The researchers used the chi-square test to analyze the differences in the proportion of callers who left their names or self-reported in the transition period compared with the post intervention period.

The employee survey results demonstrated a significant increase “from a median of 35 events/1,000 patient days in the baseline period to 125 events/1,000 patient days in the postintervention period ($p < .001$ for the three period, Kruskal-Wallis test)” (Cohen et al., 2004, p. 428). The results of the reporting rates via the hospital hotline telephone system also indicated a significant increase in reporting ($p < .001$): from a median 3 calls/1,000 patient days during the baseline period (2.83 [1.86-4.28]) to 23 calls/1,000 patient days (22.79 [19.51-26.27]). The researchers reported a small but significant increase in staff satisfaction with the established safety measures and reduced fear of punishment or retribution for reporting medical errors (from 4.68 ± 1.10 to 4.93 ± 1.03 , $p < .001$). Cohen et al. (2004) posited that the established outcome measurements provided empirical proof of culture change: error and event reporting,

percentage of hotline callers who provided their names when reporting errors, and employee survey results of staff awareness of patient safety.

The study is relevant to the current research by emphasizing a comprehensive plan of interventions and new processes to integrate the new culture. These improvements included participation by executive leadership, structural changes, reporting changes, and reward and recognition processes to reinforce culture adoption. This researcher will adapt many of these strategies.

Vazirani, Hays, Shapiro, and Cowan, (2005) conducted an experimentally designed study to determine the impact of the independent variable, a multidisciplinary intervention on communication and collaboration among doctors and nurses on an acute inpatient medical unit. The scores measuring communication and collaboration were the dependent variables. The researchers hypothesized that the intervention structure would foster improved communication and collaboration between health care providers. The researchers used the definition of *collaboration* submitted by Weiss and Davis: an interaction between doctor and nurse that “enable the knowledge and skills of both professionals to synergistically influence the patient care being provided” (as cited in Vazirani et al. 2005, p. 71).

Vazirani et al. (2005) stated that one hospital wing served as the intervention unit; another wing, which did not adopt the practices, served as the control unit. The two unit patient populations were comparable. The researchers randomly assigned attending physicians ($n = 45$) and house staff (residents and interns, $n = 111$) to either the intervention or the control units. The attending physicians were randomized within various levels of researcher, administrator, and clinician-educator. This stratification

provided educational correspondence for the house staff. Nurses ($n = 123$) were assigned to a single unit throughout the study. At baseline, the nursing demographic characteristics of the two units were comparable. Two general medicine teams, comprised of an attending physician, two residents, and three interns, staffed each unit.

Vazirani et al. (2005) reported that the intervention featured the addition of a nurse practitioner to each of the intervention teams, assignment of a hospitalist medical director, and commencement of weekday multidisciplinary rounds of 15 minutes duration. A nurse practitioner is a registered nurse who has completed advanced training and met medical specialty board qualifications (*MedicineNet.com*, 2007c); a hospitalist is a hospital-based physician who cares for the hospitalized patients of a primary care physician (*MedicineNet.com*, 2007a). The nurse practitioner role included promotion of disease specific pathways, called standardized care plans. The nurse practitioner also educated the patient and weekly telephoned newly released patients. The medical director role included oversight of the nurse practitioner and attending physicians, authorship of the pathways, coordination with the nurse manager, and coordination of the interdisciplinary rounds. The control unit provided its customary staffing, including weekly 90-minute multidisciplinary rounds.

To assess the unit collaboration and communication, Vazirani et al. (2005) administered surveys, which were not identified. The researchers surveyed physicians at the completion of each rotation. Physicians assessed collaboration with nurses, nurse practitioners, and other physicians. The researchers surveyed nurses biannually. The collaboration scales for physicians consisted of four questions: (a) “Did nurses and doctors share in decision making?”; (b) “Did nurses and doctors cooperate in

decisions?"; (c) "Did nurses and doctors plan together before making decisions?"; and (d) "Was there open communication between doctors and nurses in making decisions?" (p. 73). Physicians selected one of five responses of the communication scale: (a) "*received complete information*"; (b) "*had good communication*"; (c) "*felt certain about accuracy of information*"; (d) "*enjoyed working together*"; and (e) "*had easy access to high-quality ancillary staff*" (p. 73). The nurse scale was similar but had response adaptations appropriate to role differences. The survey also was comprised of a scale measuring communication (Vazirani et al., 2005). The physicians responded from *never* to *always* to three items related to communication: (a) the relevancy of received patient information; (b) delays in sending information; and (c) the timeliness of nurse response. The scoring of the scale was from 0 to 100. "Internal consistency reliability for the multi-item scales ranged from 0.64 to 0.91, with a median reliability of 0.84" (Vazirani et al., 2005, p. 73).

Vazirani et al. (2005) analyzed the data by a comparison of scores using a 2-tailed *t* tests and paired *t* tests. The response rate for house staff was 58% ($n = 111$), for attending physicians was 69% ($n = 45$), and for nurses was 91% ($n = 123$). The physicians reported higher collaboration mean scores with the nurses in the intervention group (63.4) than did the physicians in the control group (51.9, $p < .001$). (The researchers did not report degrees of freedom statistics.) Physicians in the intervention group reported higher collaboration mean scores with the nurse practitioners (71.8) than with the staff nurses (63.4, $p < .001$). Similarly, intervention group physicians reported higher communication scores with physicians than did control group physicians ($p = .006$). Nurses in both groups reported comparable levels of communication ($p = .59$)

and collaboration ($p = .47$) with physicians. Intervention group nurses reported higher levels of communication with nurse practitioners than with physicians ($p < .0001$).

Vazirani et al., (2005) noted that the nurses and physicians experienced collaboration very differently:

The difference between physicians and nurses in their reports of a collaborative effort is striking. Physicians may define collaboration in a different light than do nurses. Perhaps the physicians thought that collaboration implied cooperation . . . Perhaps the physicians thought that collaboration implied cooperation and follow-through with respect to following orders rather than mutual participation in decision making . . . Possibly, communication styles differ between nurses and house staff, so that physicians perceive collaboration where as nurses feel that they (i.e., the nurses) are being order to do something. A second possibility is that nurses did not feel comfortable “challenging” physicians by giving another point of view. Or, possibly the input the nurses gave was not valued or acted upon, and thus the interaction was not perceived by nurses as collaboration. (p. 75)

This study introduces a theme: nurse and physician differing definitions of and attitudes toward collaboration. The theme, summarized above by Vazirani et al. (2005), and repeated often in subsequent studies, is highly relevant to this research. The authors particularly posited that perhaps nurses were uncomfortable in presenting a challenge or disagreeing with physicians. In using SBAR, the nurse also assertively recommends an action to the physician, an explicit communication rare in most physician/nurse interactions.

In sum, the studies in this subsection demonstrate difficulty implementing organizational redesigns and cultural change. Researchers submitted that change and redesign might be difficult in organizations with hierarchal cultures (Jones et al., 1997). Jones et al. (1997) stated that change might be more successful in units or organizations, which exhibit values of teamwork, flexibility, and adhocracy. To prepare an organization for culture change, the studies by Ingersoll et al.(2001) and Rizzo et al.

(1994) demonstrate that conducting a preimplementation cultural assessment prior to implementing a major change is important. Any cultural transformation plan should address staff member stress and emotional loss resulting from the cultural change.

Another culture transformation challenge relates to the challenges of merging two or more cultures: Jones (2003) posited that an organization embracing a newly merged culture was difficult, and Fulop et al. (2005) submitted that individuals dealt with emotional loss following a merger. But even with challenges, organizations can be successful in changing cultural values and behaviors: Cohen et al. (2004) demonstrated a comprehensive successful plan improved the safety culture. Vazirani et al. (2005) established that communication and collaboration were improved by process interventions but also identified the different definitions of collaboration held by physicians and nurses.

The next section will address the relationship of culture types to health care organizational performance.

Relationship of Culture Type to Health Care

Organizational Performance

Gifford, Zammuto, and Goodman (2002) conducted a correlational study to investigate the relationships between unit organizational culture and variables of nurse quality of work life (QWL) in seven labor and delivery units in Western American urban hospitals. The QWL measures, including organizational commitment, empowerment, job satisfaction, and intent-to-turnover, comprised the dependent variables; culture type was the independent variable. Gifford et al. (2002) posited two hypotheses: (a) The Competing Values Framework (CVF) models would be associated

with organizational commitment, job involvement, empowerment, job satisfaction, and intent-to-turnover, and (b) the human relations model would be positively associated with organizational commitment, job involvement, empowerment, and job satisfaction, and negatively associated with intent-to-turnover among hospital nurses.

Gifford et al. (2002) used a questionnaire of standardized, multi-item measures; in 1991, Zammuto and Krakower and in 1995, Shortell et al. had shown the questionnaire to be valid and reliable (as cited in Gifford et al., 2002). The cultural models in this particular adaptation of the CVF were: (a) internal process with its hierarchical culture of stability, status quo, and control, (b) human relations with group culture priorities of morale and trust, (c) rational goals with its market culture and strengths of goal setting and productivity, and (d) open systems with developmental culture characteristics of innovation and growth. The four models were arranged on a framework of vertical and horizontal axes producing four quadrants. The researchers reported that an emphasis on just one of the four models resulted in dysfunctional organizations.

The survey measured the unit organizational culture with five questions from the CVF survey. The questions addressed the organizational culture traits, leadership traits, “institutional bonding, strategic emphasis, and reward systems” (Gifford et al., 2002, p. 190). Each question provided four scenarios, and among the four scenarios, the respondent divided 100 points based on the scenario similarity to his own culture.

The questionnaire also featured five questions for each of the QWL measures of organization commitment, empowerment, job involvement, and intent-to-turnover. Using a one-to-five scale, the respondents rated the degree to which they agreed or

disagreed with each statement. The aggregated coefficient alphas were .85 for organizational commitment and job satisfaction, .91 for intent to turnover, .69 for job involvement, and .76 for empowerment.

Gifford et al. (2002) assessed the unit culture employing the CVF adapted questionnaire. The researchers administered the questionnaires through the corporation mail system. Participation was voluntary; an average of 39.4 respondents from each hospital (return rate = 32.8%). To analyze the data, Gifford et al. (2002) correlated the human relations model score with the scores on the QWL measures of commitment, job involvement, empowerment, and job satisfaction and intent to turnover. Through correlation analysis, Gifford et al. (2002) established that the human relations model had the strongest statistical relationship with the QWL measures; these correlation values were not identified. The correlation analysis confirmed the researchers' hypothesis that the human relations model was positively related with commitment, job involvement, empowerment, and job satisfaction and had a statistically negative relationship to intent-to-turnover. An analysis of variance (ANOVA) of the seven hospitals human relations culture scores in descending order revealed significant differences in organizational commitment, job satisfaction, empowerment and intent-to-turnover ($p \leq .001$). The researchers did not supply other statistical results relating to the ANOVA.

The mean values of the seven hospitals included: Human Relations Model, 28.75; Commitment, 3.37; Intent-to-Turnover, 2.17; Empowerment, 3.10; and Job Satisfaction, 3.58; ($p \leq .001$). The researchers did not find any significant differences for job involvement. Gifford et al. (2002) concluded that development of the Human

Relations Model culture, which is strongly related to a collaborative culture, might be advantageous to strengthen nurse QWL. Such a national strengthening of nurse QWL might contribute to improving nurse satisfaction and to nurse retention (Committee on the Work Environment for Nurses and Patient Safety, 2004). Increased nursing satisfaction and retention would lessen the current nursing shortage crisis, previously identified in this research. Cultures, which emphasize and operationalize collaboration, continue to be linked with solutions to current health care crisis elements.

Ingersoll, Kirsch, Merk, and Lightfoot (2000) conducted a correlational study of relationships among the independent variable of organizational culture and the dependent variables of organizational commitment and readiness in organizations undergoing substantial change. Organizational readiness was viewed as flexibility of an organization in integrating organizational change. Ingersoll et al. (2000) described the participants ($N = 684$) as employees of two hospitals, which were transforming their care delivery systems to patient-focused care (PFC) systems. After six months of preparation for the redesign process, the researchers surveyed all employees, including all nursing, administrative, and ancillary support personnel. The surveys included the Organizational Cultural Inventory (OCI), Commitment/Energy subscale of the Pasmore Sociotechnical Systems Assessment Survey (STSAS), and the Innovativeness and Cooperation subscales of the STSAS. Ingersoll et al. (2000) measured organizational culture by the OCI. Internal consistency scores for the OCI subscales range from 0.67 to 0.92. This inventory categorized cultures as Constructive, Passive/Defensive, or Aggressive/Defensive. The researchers assessed organizational commitment by the 11-

item Commitment/Energy subscale of the Pasmore Sociotechnical Systems Assessment Survey (STSAS). The researchers examined the validity and reliability of the STSAS:

Limited information about the reliability and validity of the STSAS is available, although an extensive analysis was conducted by Sabiers, who confirmed the survey's originally predicted scales. The fit between Sabier's data and the hypothesized subscale model was strong, with only 9% of instances in which the residuals were less than 0.05. (Ingersoll et al., 2000, p. 14)

Ingersoll et al. (2000) assessed organizational readiness with the innovativeness and cooperation subscales of the STSAS. The 10 Lickert-type formatted items of the subscale measured likelihood of risk taking, reinforcements for innovation, and the presence of a futuristic orientation. The researchers used correlation and multiple regressions to analyze the relationships between organizational readiness commitment, and culture.

Ingersoll et al. (2000) distributed 2,157 questionnaires; 684 were returned (response rate = 41.1%). The researchers also reported internal consistency reliability analysis on all subscales: (a) Constructive Scale of the OCI (0.96); (b) Passive/Defensive Scale of the OCI (0.96); (c) Aggressive/Defensive Scale of the OCI (0.96); (d) Organizational Commitment Scale of the STSAS (0.82); and (e) Organizational Readiness Scale of the STSAS (0.89). The study established several relationships between the variables: (a) Constructive culture was moderately and positively related to organizational commitment ($r = 0.42$; $p < 0.0001$) and organizational readiness ($r = 0.36$; $p < 0.0001$); (b) passive/defensive organizational culture ($r = -0.36$; $p < 0.0001$) and aggressive/defensive organizational culture; ($r = -0.21$; $p < 0.05$) were moderately and negatively related; and (c) organizational readiness was associated positively ($r = 0.53$; $p < 0.0001$) to organizational commitment.

When three types of organizational culture were regressed onto organizational commitment, Ingersoll et al. (2000) concluded:

[T]he constructive ($\beta = 0.40; p \leq 0.0001$) . . . were predictive. . . . Organizational readiness was strongly and positively predictive of commitment to the organization ($\beta = 0.64; p \leq 0.0001$), where as organizational culture as a whole was not. (Ingersoll et al., 2000, p. 16)

Constructive cultures, moderately and positively predictive of organizational commitment, are the opposite of hierarchical cultures (Rousseau, 1990). Cultures described as constructive are team-oriented cultures established by achievement, self-expression, humanistic/helpful, and affiliative characteristics.

Ingersoll, Wagner, Merk, Hepworth, and Williams(2002) continued the analysis of the patient-focused care (PFC) model implementation, described by Ingersoll et al. (2000). This study, a repeated measures design, investigated the effect of PFC redesign, the independent variable, on employee perceptions of the work environment and work group relationships. The dependent variables included amount of collaboration, group performance, organizational commitment, employee job satisfaction, and organizational commitment. The researchers considered work environment, technology, and social component variables to be “interdependent dimensions of the environment” (Ingersoll et al., 2002, p. 165). Ingersoll et al. (2002) hypothesized that because the patient-focused environment was designed to reward innovation and to promote collaboration within the work group, employee job satisfaction and organizational commitment would increase.

Ingersoll et al. (2002) assessed the collaboration within work teams by a slightly revised version of the Collaborative Practice Scale, developed by Weiss and Davis in 1985 and refined by Welles in 1996 and 1998 (as cited in Ingersoll et al., 2002). The revised scale used Likert-type responses with an internal consistency from .79 to .87.

The researchers referenced Wells et al. (1996) for studies of construct, concurrent, and predictive validity but did not identify values. The researchers measured work group performance and social relationships by the Perceived Group Attractiveness and Cohesiveness Scale (GAC). The GAC was a six-item scale that addressed work group productivity, morale, feeling of inclusiveness, and motivation to work with the group. The researchers assessed Organizational Commitment by the Commitment/Energy Subscale with 11 items of the STSAS developed by Pasmore (1988). The first four items were added to create a Group Judgment Scale; the last two comprised a Group Attractiveness Scale. The scales coefficient alphas ranged from .83 to .88. The researchers also measured job satisfaction by a 13-item instrument used locally; no reliability or validity estimates were available for the job satisfaction scale. Ingersoll et al. (2002) reported that analyses of the finalized instrument included assessment of internal consistency reliability and construct validity. Construct validity was established by factor analysis with varimax rotation for all scales. The researchers also examined the questionnaire for “interrelatedness and for their relationship to demographic variables Reliability estimates were reasonable and consistent with findings of previous research with coefficients ranging from 0.79 to 0.93 Factor analysis supported the conceptual meaningfulness of scales” (Ingersoll et al., 2002, p. 166).

Ingersoll et al. (2002) collected data six months prior to the implementation and six months post redesign. The sample included all hospital employees, including members of administration, nursing, and support services involved in the redesign process. Ingersoll et al. (2002) analyzed the data with *t* tests to compare the difference

in subscale scores between the preimplementation sample and the postimplementation sample. The researchers used ANOVA to identify differences among hospitals, departments, and employee job category and to determine whether consistency in ratings of work characteristics contributed to differences in reported levels of the dependent variables.

The researchers reported that the response rate for the first data collection was 31.9% ($n = 688$). At the second data collection, the return rate was 22% ($n = 354$). While respondents in both samples represented all areas and positions in the hospitals, the majority represented nursing: In the preimplementation sample, the nursing return rate was 81% ($n = 420$); in the post-implementation sample, nurses demonstrated a 70% return rate ($n = 244$). The findings demonstrated mixed support for the hypothesis: Because the patient-focused environment was designed to reward innovation and to promote collaboration within the work group, employee job satisfaction, and organizational commitment would increase. The following results related to the identified variables: (a) The perception of the work environment, measured by type of culture over time, did not change; at each data collection, one-third of the subjects rated the culture as constructive; one-third rated the culture as passive-aggressive; and one-third rated it as passive-defensive; (b) perceptions of the organizational readiness, referred to as its level of innovation and cooperation, declined significantly over time ($t = 5.6$ (561), $p < .0001$); (c) employee perceptions of work group collaboration increased significantly from the first data collection to the second ($p < .0001$); and (d) job satisfaction remained constant, but organizational commitment declined significantly ($t = 2.5$, (783), $p = .01$).

Following the post-implementation data collection, the researchers reported that the respondents' characteristics and perceptions about work group cooperation, innovativeness, and organizational commitment were different. Perceptions regarding work group cooperation [$F(344) = 42.46, p < .0001$] innovation [$F(344) = 15.60, p < .0001$] and commitment to the organization [$F(344) = 38.80, p < .0001$] differed according to the organizational role. Education attainment also influenced perceptions toward organizational innovativeness [$F(344) = 6.34, p < .0001$] and work group cooperation [$F(344) = 8.24, p < .0001$]. Ingersoll et al. (2002) reported that post-hoc comparisons (Scheffe) demonstrated that administrators and personnel except staff at the post implementation data collection had significantly more positive assessments of cooperation ($p < .0001$), innovativeness ($p < .0001$), and organizational commitment ($p < .0001$). Also respondents with graduate degrees and above reported significantly more positive perceptions of the work group cooperation and the organizational readiness (The researchers did not report the p value.)

Seago (1996) reported a correlation study to examine the statistical associations of work group culture, workplace stress, and hostility, the independent variables, to nursing unit outcomes of absenteeism and turnover, the dependent variables. The researcher conducted the study in 67 nursing units in five academic, tertiary care university medical centers on the West Coast of the USA. The study unit of analysis was the nursing unit rather than the individual nurse. Seago based her study on the Karasek job strain model, which

has been used to describe numerous occupations in the United States and in other countries. There is an indication that those occupations that arouse stress hormones are those that have low decision-making latitude or control and have high psychologically demanding tasks, such as those with time pressure. These

two factors interact to form what is called job strain and have been described by the Karasek job strain model. (p. 40)

Seago (1996) identified the sample as purposive and voluntary. She invited all nursing staff members working at least 20 hours per week to participate. To be included in the study, the unit was required to have at least 25% of the staff submit surveys. Seago (1996) measured the unit culture with the Organizational Culture Inventory (OCI). She measured workplace stress by the Job Content Questionnaire, a 15-item instrument, which assesses psychological demands. The Cronbach's alpha ranged from 0.69 to 0.77 with an overall alpha of .69. She assessed hostility by the Cook and Medley Hostility Scale, which posed 50 true-false questions. Cronbach's alpha of the Cook and Medley Hostility Scale was 0.83. She collected absentee data for October, November, and December 1993 from archived staffing records for each unit. The researcher calculated the absenteeism rate by dividing the sum of the total number of shifts lost for a three-month period by the total number of possible shifts for that three-month period. She also collected data for turnovers during 1993 from archived staffing records or management information services. She computed the turnover rate by dividing the number of staff terminations per year and multiplying it by a 100. She divided this numerator by the denominator, which was the average staff work force for the year.

Seago (1996) analyzed the data by performing Pearson's correlations. She reported that positive relationships existed between psychological demand and both aggressive-defensive ($r = 0.420$; $p = 0.001$) and passive-defensive ($r = 0.781$; $p = 0.001$) cultures. A significant relationship existed between hostility and the aggressive-defensive culture ($r = 0.322$; $p = 0.05$). All 67 units had predominantly constructive

unit cultures as assessed by the OCI. All units scored in the active work quadrant of the Job Content Questionnaire. Scoring in the active work quadrant indicated that units perceived they had active jobs with low strain, high decision latitude, and high psychological strains. On the Cook and Medley Scale, the units also scored in the lower than average of the hostility range. Little variability existed on the culture, strain or hostility scores of the different units. Variability in the absenteeism and turnover measures was high.

The study supported that an inverse relationship existed between decision latitude and absenteeism in the nursing units (Seago, 1996): Decision latitude was significantly negatively correlated with absenteeism ($r = -0.27, p < .05$). The greater the work group decision latitude, the lower the absenteeism. The researcher stated that this finding agreed with the findings of Taunton, Kranmpitz, and Woods (1989). This finding (Seago, 1996), related to the subsequently presented findings of Ulrich et al. (2005), again demonstrates the importance of nurse input into the care decisions of their patients. In using SBAR, the nurse will have a standardized, accepted format to make a recommendation for patient care.

Meterko, Mohr, and Young (2004) reported a correlation study of the relationship between teamwork culture of hospitals and patient satisfaction reports. The researchers hypothesized that a culture of teamwork would be positively associated with patient satisfaction. Culture type was the independent variable; patient satisfaction was the dependent variable. The researchers studied this relationship in the Veteran Health Administration (VHA) System

To measure the independent variable, hospital culture type, Meterko et al. (2004) utilized the culture survey by Zammuto and Krakower (as cited in Meterko et al., 2004), related to the Competing Values Framework. The survey was based on two dimensions, the internal versus the external dimension and the stability versus the flexibility dimension. When these two dimensions were crossed, four cultural types emerged: Teamwork, Entrepreneurial, Bureaucratic, and Rational. Teamwork/Clan cultures emphasized collaboration among departments and employees. Entrepreneurial cultures stressed risk taking and innovation. Bureaucratic/Hierarchical cultures valued chain-of-command, control and formal policies. Rational cultures emphasized task completion and production. Meterko et al. (2004) reported that the Zammuto and Krakower culture assessment consisted of five questions related to organizational style of their organization. For each question, the respondents distributed 100 points among descriptions of the four culture types. Because the assessment method required respondents to divide a fixed number of points among four culture types, the number of points a respondent assigned to one culture type affected the numbers that he assigned to the other types.

Based on a stratified random sampling procedure, Meterko et al. (2004) surveyed 16,405 employees throughout the VHA system. Fifty-two percent of the employees returned their surveys ($N = 8454$). The researchers stated that culture type internal consistency reliability, determined by Cronbach's alpha, was consistent with the values reported by other researchers using the Zammuto and Krakower culture assessment: (a) .79 for Teamwork Culture; (b) .75 for Bureaucratic Culture; (c) .60 for Entrepreneurial Culture, and (d) .40 for Rational Culture. The researchers aggregated

the respondent-level culture scores to calculate the average culture score for each hospital. To test the validity of this aggregation, the researchers compared the within group variance and the between group variance. The F ratios were significant for each culture dimension ($p < 0.001$). This significance indicated that the aggregation was valid.

Meterko et al. (2004) also collected data for patient satisfaction from the VHA national database. The data came from inpatient (response rate = 65%) and outpatient survey data (response rate = 74%) collected in 2000. The researchers identified the inpatient questionnaire nine subscales and noted that the outpatient questionnaire lacked the transition, family involvement, and physical comfort subscales. The researchers reported that the subscales on both surveys had levels of internal consistency, as measured by Cronbach's alpha, generally above .60. Reported by subscale, the Cronbach's alpha for the inpatient survey precedes the Cronbach's alpha of the outpatient survey. All scales, however, were not applicable (NA) to the outpatient survey: (a) access, .61, .75; (b) preferences, .66, .71; (c) emotional support, .80 .42; (d) patient education, .76, .86; (e) coordination of care, .54, .81; (f) courtesy, .72, .56; (f) physical comfort, .71, NA; (g) family involvement, .74, NA; (h) transitions, .82, NA; and (i) coordination of care (this visit), NA, .68.

Meterko et al. (2004) explained that inpatient survey data were collected randomly from each hospital. The stratified sample of 175 patients was selected from each of six hospital areas: medicine, surgery, psychiatry, neurology, spinal cord injury, and rehabilitation medicine. Each outpatient facility also randomly sampled 175

patients, who had visited a primary care provider two months prior to the survey and also had visited a specialist during the six months before the primary care visit.

Meterko et al. (2004) next examined the relationship between the Teamwork Culture and patient satisfaction. Due to the measurement method, the number of points assigned to each culture type was not entirely independent. The researchers assessed this relationship by conducting eight separate regression models to consider the four culture types in relation to both inpatient and outpatient satisfaction. The researchers applied a Bonferroni correction to control for inflation in the alpha level. The researchers controlled for a number of hospital level characteristics, including size, teaching status, geographic location, and urban/rural status.

Meterko et al. (2004) reported the results from 125 hospitals with complete data. Of the four types of culture, Bureaucratic Culture had the highest number of points, a mean of 44.1 of a possible 100 points. The second highest culture was Rational, which registered a mean of 23.7 points. Teamwork Culture received a mean of 18.6 points. Entrepreneurial Culture received an average of 13.2 points. Meterko et al. (2004) also found that two of the four culture types were statistically significant in the inpatient regression models. Teamwork Culture was related positively to inpatient satisfaction ($\beta = .29, p < 0.0025$ [Bonferroni-adjusted equivalent for $p < 0.01$]); Bureaucratic Culture was negatively related to inpatient satisfaction ($\beta = -.30, p < 0.0025$ [Bonferroni-adjusted equivalent for $p < 0.01$]). None of the culture types were statistically significant for the outpatient models. Meterko et al. (2004) reported that certain control variables were statistically significant in their relationship to satisfaction. Hospital size was related negatively with inpatient satisfaction ($\beta = -.27, p < 0.0025$ [Bonferroni-

adjusted equivalent for $p < 0.01$]); hospitals with more beds, the standard method for denoting hospital size, scored more poorly on patient satisfaction measures.

Geographic region was significantly associated with outpatient satisfaction; outpatient facilities in the East scored significantly at $p < 0.0025$ (Bonferroni-adjusted equivalent for $p < 0.01$) higher patient satisfaction than other regions in all culture types

(Teamwork $\beta = .24$; Entrepreneurial $\beta = .22$; Bureaucratic $\beta = .24$; Rational $\beta = .22$).

At the same significance level, outpatient facilities in the South negatively predicted outpatient satisfaction (Teamwork $\beta = -.27$; Entrepreneurial; $\beta = -.27$; Bureaucratic $\beta = -.27$; and Rational $\beta = -.30$).

Meterko et al. (2004) further examined the extent of discrimination between high and low inpatient satisfaction for Teamwork and Bureaucratic cultures. After separating hospitals into Teamwork Culture and Bureaucratic Culture, the researchers divided the hospitals in the two culture groups into the two quartile, mid two quartiles and bottom quartile of the culture. They conducted an analysis of covariance (ANCOVA) on the culture groups. The results of the ANCOVA were statistically significant for only the Teamwork Culture. Teamwork Culture in the top and mid quartiles had significantly better inpatient satisfaction scores than hospitals in the bottom quartile. Meterko et al. (2004) asserted, “. . . [H]ospitals in the top quartile had an adjusted mean inpatient satisfaction score that was close to 4 points larger than that of hospitals in the bottom quartile, the equivalent of nearly 1 standard deviation of the hospital-level score distribution” (p. 496). No statistically significant differences existed among the Bureaucratic Culture top and bottom quartiles in relative to patient satisfaction. Outpatient satisfaction was not related to any of the culture dimensions. A

Teamwork Culture in this version of the CVF is synonymous with clan, personal or Human Relations Culture and its opposite is a Bureaucratic or Hierarchical Culture. Meterko et al. (2004) again established that a teamwork culture was associated with positive outcomes of patient satisfaction, an outcome necessary in a future reformed health care system.

Parker, Wubbenhorse, Young, Desai, and Charns (1999) assessed the relationship of culture type, the independent variable, to the successful implementation of Quality Improvement (QI) methodologies, the dependent variable, in Veterans Health Administration hospitals. QI methods include staff education on statistical and problem-solving methods and the establishment of interdisciplinary process improvement teams. In this mixed design study, the researchers completed a correlation study with “site visits to collect qualitative data for clarifying statistical relationships among study variables” (Parker et al., 1999, p. 66). The researchers measured the organizational culture with the Zammuto-Krakower Culture Inventory, employed in the preceding study (Meterko et al. 2004). The inventory assessed the culture as being Group, Developmental, Hierarchical, or Rational. The researchers included this 20-item instrument in their questionnaire sent to nonmanagerial employees.

Parker et al. (1999) employed three surveys to assess the QI implementation and management characteristics. The researchers neither named the questionnaires nor reported reliability or validity information. The first questionnaire, measuring degree of QI implementation, was sent by mail to a random sample of nonmanagerial hospital employees. The researchers referenced Barbour in explaining the Veterans Healthcare Administration development of this 42-item Likert-type response instrument (as cited in

Parker et al., 1999, p. 69). The second questionnaire, assessing the top management commitment, was sent to all service chiefs and department managers who oversaw patient care activities. The survey, which instructed respondents to rate the commitment of top and executive management to QI-related practices, was comprised of 10 statements with a Likert-type scale. The third questionnaire was distributed to hospitals directors. The researchers stated, “We used the survey data to perform quantitative analysis regarding a hospital’s top management commitment and culture (i.e., emphasis on innovation and teamwork) relative to its QI implementation” (p. 65).

Parker et al. (1999) used a stratified random sampling procedure to select hospitals for qualitative data collection site visits. Based on the first survey results, they selected five hospitals from the top quartile and five from the bottom quartile of QI Implementation. One of the selected hospitals withdrew from participation ($n = 9$). Two researchers, who used protocols, interviewed representatives of various leadership levels.

Parker et al. (1999) employed univariate and multivariate analyses for the quantitative analysis. The first questionnaire, measuring the degree of QI implementation, had a return rate of approximately 67% ($n = 9993$); the second questionnaire, assessing the top management, had a return rate of 71% ($n = 2406$); the third questionnaire for hospital directors had a 81% return rate ($n = 130$). The univariate results demonstrated that hospitals in the top quartile for QI implementation had significantly higher top management commitment and Group/Developmental Culture scores than did hospitals in the bottom quartile (Top quartile hospitals: Group/Developmental Culture, $M = 39.34$; Top Management Commitment mean, $M =$

3.72; bottom quartile hospitals: Group/Developmental Culture mean, $M = 32.41$; Top Management Commitment mean, $M = 3.46$; $p \leq 0.01$). The researchers conducted further multivariate regression analysis to explore this relationship and other contextual factors using data from the three surveys and/or “secondary sources” (Parker et al., 1999, p. 66), including involvement of medical staff in QI activities, union resistance to QI, and the role of external QI consultants. Parker et al. (1999) reported,

Of the various multivariate models examined, the top management commitment and the culture measures were found to be consistently and significantly associated with the degree of implementation: larger hospitals revealed a greater degree of QI implementation. The best fitting regression model had an R^2 of approximately .58. This model was also statistically significant, with a p value of $<.001$. Thus, while study findings supported our hypotheses linking top management commitment and culture with the progress of QI implementation, little evidence existed for linkages between the other contextual/organizational factors and QI implementation. (p. 67).

Parker et al. (1999) reported that the qualitative results supported the quantitative research conclusions: The most distinctive cultural aspect of the high QI facilities was that QI was not regarded as program, but as a value, integrated into all aspects of the organizational culture; the low QI group cultures were common in their tendencies to resist change. Two issues from the study (Parker et al., 1999) are highly relevant to the current research: The results demonstrated that hospitals in the top quartile for QI implementation had significantly higher top management commitment and group/developmental culture scores than did hospitals in the bottom quartile. Again, similar to measures of patient satisfaction (Meterko et al., 2004); organizational commitment, organizational readiness (Ingersoll et al., 2002); and commitment, empowerment, and job satisfaction and involvement (Gifford et al., 2002), QI integration was positively related to a culture which emphasized and displayed

teamwork and collaboration. Again, this study demonstrates the imperative of leaders implementing cultural transformation; the corollary for the current research necessitates medical staff and nursing leadership advocating the use of SBAR to build collaboration among all staff members.

Rondeau and Wagar (1998) conducted a correlation study of the relationship between hospital organizational culture type, the independent variable, and hospital organizational performance, the dependent variable. The researchers did not state a hypothesis. Rondeau and Wagar (1998) identified their sample as 1,014 chief administrators of Canadian hospitals. The hospitals were acute, chronic, and specialty facilities with an organized medical staff, eight or more beds, and had at least five full-time employees. The researchers used the 12-item questionnaire related to frameworks proposed by Zammuto and Krakower (1991), Quinn and Kimberly (1984), and Hooijberg and Petrock (1993). They asked respondents to register on a 6-point Likert-type scale the degree to which they agreed or disagreed with 12 statements describing values. The statements corresponded to the independent variables of the four organizational cultures: group, entrepreneurial, hierarchical, and rational. The researchers reported that the Cronbach's alpha was $< .74$ for each of the four culture types. They received 441 completed surveys (response rate = 43.5%). The researchers noted that small and rural hospitals were slightly underrepresented in the sample. Rondeau and Wagar (1998) measured the organizational performance simultaneously on the survey. They asked the survey participants to assess subjectively their organizational performance on 12 key measures relating to customers, employees, and

operational issues. They also included a ten-item measure to assess the overall organizational learning orientation.

Rondeau and Wagar (1998) reported the most common culture types found in their sample were group cultures and rational cultures. The executives scored their assessments on a scale (1 to 6). The higher the score, the greater the culture was represented in the environment. The hospital executives responded that hierarchical cultures were the least represented. The culture types and their respective scores follow: (a) Group Culture—4.23; (b) Entrepreneurial Culture—3.57; (c) Hierarchical Culture—3.57; and (d) Rational Culture—4.12. Rondeau and Wagar (1998) also reported the correlation of the perceived culture types with perceived organizational performance. Smaller hospitals were slightly more likely to report having Group Cultures and larger sized hospitals were slightly more likely to report having more Entrepreneurial Cultures. The researchers reported that Group Cultures were strongly correlated with employee morale ($r = .61, p < .001$) and with organizational commitment for employee training and development ($r = .45, p < .001$). Hospitals with entrepreneurial cultures reported higher scores for organizational flexibility and adaptability ($r = .48, p < .001$). These Entrepreneurial Cultures also reported the second highest association to morale ($r = .41, p < .001$) and the lowest resistance to change ($r = -.34, p < .001$). Rational Cultures were reported to have higher associations with organizational operating efficiency ($r = .34, p < .001$) and financial performance ($r = .17, p < .001$). The final culture type, Hierarchical, showed negative associations with patient satisfaction ($r = -.13, p < .01$), employee satisfaction ($r = -.17, p < .01$), and commitment to learning ($r = -.30, p < .001$). The researchers affirmed the challenge of

health care leaders to create and maintain dynamic organizational cultures that can respond to new market opportunities and threats quickly. Of note to this researcher are two study limitations which inhibit its application to the current research: The sample included only health care administrators, and the research took place in the Canadian nationalized health care system with perhaps very disparate organizational cultures than those in the United States.

Friedman and Berger (2004) reported a repeated measures design study of a surgical team redesign in a tertiary hospital. The purpose was to evaluate the effects of surgical team restructuring, the independent variable, on the length of stay and patient satisfaction outcomes, the dependent variables. The researchers hypothesized that improving team structure and communication would provide cost-effective and high-quality patient care for general surgery patients. Friedman and Berger (2004) described the general surgery patient care team prior to the intervention as a disorganized, informally organized system. The system lacked structured collaboration among physician, nurses, and case managers.

Friedman and Berger (2004) described the independent variable, the intervention: a structured patient care team concept with well-defined roles and responsibilities, emphasizing open communication and collaboration through the development of communication processes, a standardized multidisciplinary rounding process, and daily meetings. The daily meeting goal was to facilitate team communication and update patient discharge planning. The entire patient care team met monthly to orient new members, to gather feedback for process improvement, and to identify team successes.

The researchers collected length of stay data from July 1, 1998 until September 31, 2003 from the hospital databases. The data included identification of general surgery patients admitted to the two primary general surgery floors after surgery. The study population was comprised of all patients admitted to the hospital general surgery teams during the study period. Friedman and Berger (2004) also utilized patient satisfaction survey data from the Press Ganey Company, which surveys over 900 inpatient hospitals. A factor analysis, performed to confirm the inpatient survey construct validity, identified nine factors that accounted for 73% of the total variance in patient responses. The Press Ganey researchers also performed a principle component extraction with Promax oblique rotation. They assessed the predictive validity, established through simple regression analyses. The regression analyses demonstrated that individual items were a significant predictor ($p = .001$) of patient response to the question assessing the likelihood to recommend the facility (beta ranged from .35 to .85). The multiple regression analysis also established that collectively, all items were significant predictors of patients' reported likelihood to recommend the hospital [$F(37,565519) = 46373.744, p = .001, R^2 = .75$]. The R^2 when expressed as a percentage, means that 75% of the variance in the outcome can be attributed to the model (Field, 2000). The Cronbach's alpha for the entire survey was .97 (*Press Ganey Inpatient Survey Psychometrics*, 2006). The Press Ganey Survey contained questions measuring the patient's opinion about the quality of care during his hospital stay. The patient had response options of a five-point Likert-type scale: (a) 1 (*very poor*), (b) 2 (*poor*), (c) 3 (*fair*), (d) 4 (*good*), and (e) 5 (*very good*). The collected data were adjusted, based on several criteria. The researchers asserted that the adjustment

standardized data made statistical comparison over time possible. The researchers assigned a case weight to each patient based on diagnosis related groups, with the mean case weight serving as a measure for patient complexity and acuity. They listed the following adjustment factors: a mean age of 54 years, 53% of patients as female, and a mean case weight of 2.6. Friedman and Berger (2004) analyzed the adjusted data on an integer scale and a log scale utilizing multiple linear regression models.

The number of admitted surgery patients increased on the private general surgery service from 2,302 patients in FY 1998 to 3,450 patients in FY 2002; 68% were admitted to the primary general surgery floors. The number of surgery patients who were admitted by the ward general surgery service remained stable during the study period: 961 patients in 1998 and 972 patients in 2002. Of these patients, approximately 79% were admitted to the general surgery floors. The researchers reported that across both services, the total number of inpatient days, defined as the sum of all inpatient days for the studied patients, decreased. A significant decrease in the mean length of stay across the two time periods for the private ward services occurred. When they compared the adjusted mean length of stay on an integer scale, a significant decrease ($p < .001$) between the first ($M = 6.73$) and second ($M = 5.50$) time periods was demonstrated for the private service but not for the ward service ($M = 8.78$, $M = 8.08$). The researchers also compared the adjusted length of stay on the two services using a log scale; a log scale reduced the effect of outlier data appoints. The mean length of stay for both services significantly decreased between time periods. The decrease was greater for the ward service (FY 98-00, $M = 7.11$; FY 01-03, Q1, $M = 6.22$) than for

the private service in both time periods (FY 98-00, $M = 5.96$; FY 01-03, Q1, $M = 4.78$), suggesting a greater presence of extended patient stay in the group.

Freidman and Berger (2004) also reported the patient satisfaction survey data. Because the facility did not survey its patients until 2001, the researchers noted that they could not compare these data with a pre and post intervention similar to the length of stay data. They later identified this inability as a limitation of their study. To compensate for this inability, Freidman and Berger (2004) stated that the “data after 2001 are crucial to assess any negative aspects of the new initiatives” (p. 1196). The researchers selected the survey results from the second and fourth quarters of fiscal year 2002. The percentage of patients responding with *good* or *very good* overall responses ranged from 82.1% to 87.9% for the two general floors. The authors cited data, which determined that both floors had scores at or above the hospital mean in questions of discharge speed and preparation of home care services on discharge. Both floors were above the hospital mean regarding the perceived skill of the patients. The researchers asserted that the data showed that patients were efficiently and well prepared for their discharge.

Freidman and Berger (2004) found that the hypothesis was supported: “Restructuring the patient care team yielded a decreased mean length of stay while maintaining a high level of patient satisfaction. This analysis helps validate a hospitalwide initiative to maintain a high level of patient care while increasing patient volume” (p. 1194). This study demonstrates a structured process change, which emphasized open and collaborative communication and produced a high level of patient satisfaction, while providing increased efficiency: decreased length of stay while

increasing the number of patients. SBAR is a structured process change, which emphasizes collaborative communication. Increased efficiency, including lower length of stay, yields lower costs for systems and patients. Decreased costs and high levels of patient satisfaction are two identified outcomes that providers must accomplish in a reformed health care system. Freidman and Berger (2004) demonstrated that process changes could produce these seemingly paradoxical outcomes: delivering high patient satisfaction simultaneously while reducing costs.

Nelson, Batalden, Huber, Mohr, Godfrey, Headrick et al. (2002) reported an interpretive qualitative study conducted from June 2000 through June 2002 to identify the variables producing high performing clinical microsystems in health care. Nelson et al. defined a *clinical microsystem* as:

a small group of people who work together on a regular basis to provide care to discrete subpopulations of patients. It has clinical and business aims, linked processes, and a shared information environment, and it produces performance outcomes. Microsystems evolve over time and are often embedded in larger organizations. They are complex adaptive systems, and as such they do the primary work associated with core aims, meet the needs of internal staff, and maintain themselves over time as clinical units. (p. 474)

The researchers studied the processes, values, and methods of high performing clinical microsystems.

Nelson et al. (2002) selected a purposive sample. To obtain the sample of high performing systems, the researchers used various search methods: (a) award winners, (b) literature citations, (c) previously identified top-performing clinical units by IOM and Institute of Healthcare Improvement, and (d) nominations by expert opinions.

From the resulting 120 sites, the researchers selected 75 sites, representing the most promising in the categories of primary care, specialty care, inpatient care, nursing home

care, and home health care. The researchers conducted structured screening telephone interviews at 60 sites and asked the site leader to complete a brief questionnaire. Based on the screening interviews, the questionnaires, and the participant interest, the researchers selected the 20 high performing clinical microsystems.

Nelson et al. (2002) collected data at site visits of two days and conducted in-depth interviews with all types and levels of staff. The researchers' other data collection methods included direct observations and reviews of medical record and financial information. Nelson et al. (2002) analyzed the transcribed data from the interviews. Through a cross-case analysis process, the researchers coded the data and from the iterative process of coding and continual recoding, they identified success characteristics. To increase trustworthiness of the data, two members independently analyzed the coding categories and arrived at consensus. The researchers aggregated the data within each site to determine the proportion of the coded data that represented each of the success categories. They used the results of the medical record reviews and financial analysis to identify the best practices.

Nelson et al. (2002) explained that the 20 high-performing clinical microsystems represented 16 different U.S. states and Canadian provinces. The researchers reported the themes that had emerged from the data analysis: "a common set of nine success characteristics were shared by these Microsystems and interact with one another to produce highly favorable systemic outcomes" (p. 482). These characteristics included: (a) leadership of the microsystem; (b) culture of the microsystem; (c) macro-organizational support of the microsystem; (d) patient focus; (e) staff focus;

(d) interdependence of care team; information and information technology; (e) process improvement; and (f) performance patterns.

Of particular relevance to this research are the definitions of culture and interdependence of the care team:

Culture . . . is a pattern of values, beliefs, sentiments, and norms that reflect clinical mission, quality of staff work life, and [respectful][sic] patterns of interpersonal relationships. The illustrative underlying principle is shared values, attitudes, and beliefs reflect the clinical mission and support a collaborative and trusting environment Interdependence of care team . . . is characterized by trust, collaboration, willingness to help each other, appreciation of complement roles, and a recognition that all contribute individually to a shared purpose. The illustrative underlying principle is every staff person is respected for the vital role he or she plays in achieving the mission. (Nelson et al., 2002, p. 485)

The researchers quantified all data text by theme and reported the interview text content analysis results to quantify the percentage of the coded text, which related to a specific topic. The researchers gave no additional information concerning the content analysis process. Of particular relevance to this research is that 4.3% of all coded text units related to the culture and that 7.7% of the units related to the care team interdependence.

The researchers cited a quotation from the interview transcripts to illustrate the success characteristics of (a) culture and (b) team interdependence:

The initial entrance barrier is a bit higher because the culture is stronger here than in some of the other units I work. So it's a bit harder to break into the unit or to be integrated since they have such a strong team. I feel respected and like I am a valuable member of the team. (Nelson et al., 2002, p. 487)

Other examples from the transcripts demonstrated the strength of this team construct and identity: "Together, the team works. When you take any part away, things fall

apart. It's really the team that makes this a great place to work" (Nelson et al., 2002, p. 487) and

[w]e decided as a team that our patients needed flu vaccinations, so we all volunteered on a Saturday, opened the practice and had several hundred patients come through. We ended up doing quite a bit more than flu shots including lab work, diabetic foot checks and basic checkups. (Nelson et al., 2002, p. 488)

Staff in these high performing microsystems credited a strong culture, which affirmed teamwork as a variable to their exemplary high performance.

The research presented in this subsection explicates positive organizational outcomes, requisite to solving the current health care crisis and statistically linked to a culture characterized by teamwork and Developmental/Group/Clan/Human Relations cultures. Gifford et al. (2002) established that the Human Relations Model was related positively with commitment, job involvement, empowerment, and job satisfaction and had a statistically negative relationship to intent to turnover. Ingersoll et al. (2002) reported that Constructive Culture was moderately and positively related to organizational commitment ($r = 0.42; p < 0.0001$) and organizational readiness ($r = 0.36; p < 0.0001$); Meterko et al. (2004) demonstrated that a Teamwork Culture was positively related to inpatient satisfaction. Parker et al. (1999) established that the top quartile of hospitals with successful implementation of QI methodologies had significantly higher group/developmental culture scores than those in the bottom quartile. Freedman and Berger (2004), by developing collaboration with a structured process in a surgical department, significantly decreased length of stay and maintained patient satisfaction while increasing volumes. Nelson et al. (2002) identified culture and care team member interdependence as important traits of outstanding North American clinical microsystems.

Summary of Organizational Culture and Performance of Health Care Organizations

The research findings in this section both amplified the characteristics of organizational culture and strengthened the relationship between culture types and performance outcomes. Ulrich et al. (2005) established that while nurses viewed their relationships with physicians to be improved, further opportunity remains to improve nurse-physician relationships, to increase nursing impact on workplace decisions, to influence patient care, and to build a more collaborative nurse-physician environment. Wilson et al. (2005) demonstrated that a quantitative and a qualitative cultural assessment captured different nuances: In spite of the quantitative assessment of a collaborative culture, the researchers identified underlying tensions within that predominant culture. Rizzo et al. (1994) and Smith et al. (2000) established the importance of segmentation, subsequent analysis of, and planning for subculture response to any culture change initiative.

Such major redesigns as PFC implementation and organizational mergers both affect and are affected by culture. Ingersoll et al. (2001) and Fulop et al. (2005) established that staff members experienced loss after these changes. These studies (Ingersoll et al., 2001; Fulop et al., 2005) as well as others in this section emphasized that changing organizational culture change while difficult is achievable (Schien, 1986). Cohen et al. (2004) demonstrated the importance of a well-defined cultural change plan with crucial leadership involvement, structural changes, measurement, and organizational feedback. These researchers clearly defined the culture that they wished to create. Vazirani et al. (2005) established after a process intervention that a culture

could become more collaborative and, in doing so, could sustain high patient satisfaction while increasing efficiency.

Several studies demonstrated links between types of cultures, which manifested teamwork with performance outcomes: The data of Friedman and Berger (2004) demonstrated structure changes and collaboration reinforcement were associated with decreased length of stay; decreased length of stay signifies decreased health care costs. Two qualitative studies (Nelson et al., 2002; Wooten & Crane, 2003) highlighted disparate types of recognized, high performing health care organizations. Both studies, posited that staff credited a culture exhibiting teamwork and collaboration as a major contributor to high performance. Gifford et al. (2002) established that the Human Relations Model was positively related with commitment, job involvement, empowerment and job satisfaction and had a statistically negative relationship to intent to turnover. Ingersoll et al. (2002) showed that Constructive culture was moderately and positively related to organizational commitment ($r = 0.42$; $p < 0.0001$) and organizational readiness ($r = 0.36$; $p < 0.0001$); Meterko et al. (2004) demonstrated that a teamwork culture was positively statistically related to inpatient satisfaction.

Seago (1996) asserted that an inverse relationship existed between decision latitude and absenteeism in the nursing units: Decision latitude was significantly negatively correlated with absenteeism ($p = 0.028$). The greater the work group's decision latitude, the lower was the absenteeism. Low decision latitude was associated with a Formal/Hierarchical Culture, which is the opposite of a Group/Clan/Human Relations Culture. In sum, a collaborative teamwork culture in various health settings has been linked to higher quality, patient and employee satisfaction, staff retention and

greater efficiency. These outcomes are needed to produce the safer, integrated, cost effective, more service oriented health system, envisioned by health care reformers (*Building a Better Health Care System; Specifications for Reform*, 2004).

The literature reviews on culture and performance on the hospital intensive care unit (ICU) are presented in the following section.

Organizational Culture and Performance of the ICU

Due to patient acuity and vulnerability, the multidisciplinary nature of its care, and the complexity and often-emergent work, the ICU warrants an in-depth consideration in a study of culture. Sherwood, Thomas, Bennett, and Lewis (2002) described its domain: “Critical care environments are fast paced with intense decision-making coordinated by a constantly changing network of providers with little attention to the human factors involved” (p. 333). For critically ill patients to progress, the ICU team must perform specialized and often complex tasks often under grave circumstances: “obtain tests, make diagnosis, implement treatments, remove tubes, and catheters, prevent complications, and manage pain” (Provonost, 2003, p. 71). Implementation of these tasks and technologies to the most critical patients establishes the ICU as the most expensive site to deliver patient care services (Randolph, 2002).

The ICU culture is considered in four categories: (a) the petition for a collaborative culture by nursing and physician organizations; (b) the relationship of culture and performance in the ICU; (c) variation in ICU team members’ perception of culture and collaboration, and (d) communication improvements in the ICU.

*The Petition for a Collaborative Culture by Nursing and
Physician Organizations*

Brilli, Spevetz, Branson, Campbell, Cohen, and Dasta (2001) explicated the Society of Critical Care Medicine (SCCM) task force report. The purpose of the task force was to create a model of *best practice* of critical care practice, which occurs in the ICU. Thirty-one multidisciplinary critical care healthcare providers, who comprised the task force, produced their report through consensus expert opinion and evidence in the literature. Brilli et al. (2001) cited several aspects of the *best practice* model. One aspect has implications for this researcher's exploration: multidisciplinary critical care. Billi et al. (2001) posited, "A multidisciplinary approach to the management of critically ill patients may be an important factor in the quality of care provided in the ICU" (p. 2009). In 1994 the SCCM and the American Critical Care Nurses first jointly advocated a multidisciplinary approach to the practice of intensive care medicine. The leadership of both organizations proposed collaboration and shared responsibility for ICU leadership as a fundamental part of optimizing the medical care (Brilli et al., 2001).

In 1996 Carlson, Weiland, and Srivathasan (as cited in Brilli et al., 2001) emphasized this multidisciplinary collaboration aspect of critical care practice through identification of ICU collaborative characteristics: (a) medical and nursing directors with authority and co-responsibilities; (b) collaboration of members of nursing, respiratory therapy, and pharmacy with the medical staff in a multidisciplinary team approach; (c) use of standards and protocols to reduce variation; (d) commitment to coordination and communication for all aspects of ICU management; and (e) emphasis on provider certification, research, education, and patient. Brilli et al. (2001) affirmed

that the task force supported collaboration by the physician team leader and the critical care nurse manager in the education, structure, and evaluation of ICU team dynamics.

The call for collaboration was amplified in 2005 when the American Association of Critical Care Nurses (AACN) commenced its Healthy Work Environment Initiative, a multitargeted and multiyear campaign to engage nurses, employers, and other stakeholders in the redesign of nursing work environments. AACN released its *Standards for Establishing and Sustaining Healthy Work Environments* (Barden, 2005) which recognized the urgency and importance of improving these environments. AACN's *Standards for Establishing and Sustaining Healthy Work Environments* proposed unit culture reform in six standards: (a) Skilled Communication, (b) True Collaboration, (c) Effective Decision Making, (d) Appropriate Staffing, (e) Meaningful Recognition, and (f) Authentic Leadership.

The first three of these standards, Skilled Communication, True Collaboration, and Effective Decision Making, are highly relative to and indicative of a culture of teamwork and collaboration. As part of the Skilled Communication standards, the AACN called for health care organizations to prepare and provide critical care "team members with support for and access to education, programs that develop critical communication skills including self-awareness, inquiry/dialogue, conflict management, negotiation, advocacy and listening"(Barden, 2005, p. 17). Under this standard, the AACN also requested "the healthcare organization establishes systems that necessitate individuals and teams to formally evaluate the costs and benefits of communication on clinical, financial and work environments" (Barden, 2005, p. 18). Communication was also regarded as an essential component of collaboration.

The AANC introduced and stressed accountability in its Collaboration Standard (Barden, 2005) by calling for processes that define the accountability of collaboration and that confront team members when collaboration is absent. Each team member is also expected

to embrace true collaboration as an ongoing process and invests in its development to ensure a sustained culture of collaboration Every team member contributes to the achievement of common goals by giving power and respect to each person's voice, integrating individual differences, resolving competing interests and safeguarding the essential contribution each must make in order to achieve optimal outcomes. (p. 22)

The standards regarding decision making of the *Standards for Establishing and Sustaining Healthy Work Environments* (Barden, 2005) also promoted "collaborative decision-making" by asking for education related to "mutual goal setting, negotiation, facilitation, conflict management, systems thinking and performance improvement" (p. 25). The Effective Decision Making Standard affirmed collaborative decision making: "Individual team members share accountability for effective decision making by acquiring necessary care skills, mastering relevant content, assessing situations accurately, sharing fact-based information, communicating professional opinions clearly and inquiring actively"(Barden, 2005, p. 25). This proposed shared responsibility for decision making contrasts markedly with the report of dissatisfied nurses perceiving they have low decision latitude (Ulrich et al. 2005). The critical care nurses described in AACN's *Standards for Establishing and Sustaining Healthy Work Environments* are more assertive than medical organizations or other nursing groups in invoking collaborative practice. Physician and Nurse disparate attitudes toward collaboration was first established by Vazirani et al. (2005) in this review and will be

discussed in more detail by subsequent studies (Baggs et al., 1999; Coombs, 2003; King & Lee, 1994; Melia, 2001; Miller, 2001; Thomas et al, 2003).

The next subsection considers the relationship of culture and performance outcomes restricted to the ICU locale.

The Relationship of Culture and Performance in the ICU

Knaus, Draper, Wagner, and Zimmerman (1986) conducted a seminal quantitative study to link teamwork with performance in the ICU. The study purpose was to examine whether differences in the independent variables of structures and processes of intensive care influenced the dependent variable of effectiveness of care, as measured by hospital mortality rates. The researchers hypothesized that the degree of coordination of intensive care significantly influenced its effectiveness.

Knaus et al. (1986) compared patient treatment courses and outcomes in 13 ICUs, which had similar technical unit capabilities but differed in organization, staffing, teaching commitments, research, and education. The ICUs were in 13 hospitals selected through their written requests to participate and by their agreement to collect data on a minimum of 150 unselected patients. Following a hospital inclusion in the study, the ICU nursing or medical director completed a questionnaire on unit characteristics and practice: staffing, organization, policies, procedures, and the extent of critical care personnel participation in patient care. The researchers confirmed the validity of responses through unit site visits.

Following these visits and questionnaire reviews, two researchers classified the hospital according to a level of administrative structure, as defined by the National Institutes of Health (NIH) Consensus Conference on Critical Care: (a) Level I units had

medical directors in the unit 24 hours a day, high nurse to patient ratios, and ICU teaching and research commitments; (b) Level II units had part-time medical directors or qualified designees in the hospital and high to mid-level nurse-to-patient ratios; and (c) Level III units had part-time medical directors but relied on coverage by other in-house physicians and had lower but inconsistent nurse-to-patient ratios. A third researcher validated classification.

Knaus et al. (1986) collected data on consecutive admitted patients or on a sample of every second patient until reaching the agreed upon number. The patient data collected included: age, sex, indication for ICU admission, operative status, diagnosis, and a daily therapeutic intervention (TISS) score. The researchers explained that data collectors also compiled a treatment score, which quantified a summary measurement of intensity and type of unit care:

To reflect the nature of treatment provided, we divided the 90 treatment courses used in this scoring system into categories of active treatment (for example, the use of ventilator and vasoactive drugs), unit monitoring (use of arterial or pulmonary artery catheters), and standard floor care (blood testing, intake and output. (Knaus, 1986, p. 411)

After patients had been in the ICU for 24 hours, data collectors also reviewed each clinical record for such physiologic clinical data as blood pressure (Knaus et al., 1986). Using the Acute Physiology and Chronic Health Evaluation (APACHE) II system, the researchers classified the severity of each patient's disease. They quoted Strauss, LoGerfo, Yeltatzie, Temkin, as having "reported a high degree of interobserver reliability for the APACHE system in prospective and retrospective data collection"(as cited in Knaus et al. 1986, p. 411). The researchers stated that patient outcome data was independently confirmed by crosschecking against hospital discharge records.

To analyze the data, Knaus et al.(1986) utilized hospital death rates as the outcome measurement; they asserted “differences in death rates can reflect specific and important differences in effectiveness of patient care” (p. 411). For each patient, the researchers estimated the survival probability using a multiple logistic regression analysis. The analysis included the patient’s disease, the APACHE II score assigned initially, and whether the patient had arrived in the unit directly following elective or emergency surgery. The researchers established diagnostic categories by using the most frequently appearing 34 individual factors, which necessitated unit admission in addition to the major organ systems, affected by the disease. This calculation demonstrated “the pretreatment risk stratification, which tabulates observed and predicted death rates for patients within three points of APACHE II scores” (Knaus et al., 1986, p. 411). The researchers projected a group death rate by adding individual patient estimates for each hospital using the APACHE II scoring system. They divided the sum by the total number of patients and compared the ratios of the projected and actual death rates. Based on these scores, the researchers ranked each hospital. Knaus et al. (1986) tested for overall significance of difference in mortality rates across the 13 hospitals by a multivariate logistic regression analysis, which controlled for APACHE II influence, emergency surgery status, and operative and nonoperative diagnosis. The researchers tested difference in two ways: (a) a *t* test to determine the difference between the means of the observed and projected death rates of each hospital and (b) partial chi-square test (1 *df*) tested the significance of the impact of individual hospitals “after controlling for all the prognostic factors listed above” (Knaus et al., 1986, p. 412). The researchers compared those hospitals which were identified as significantly

different to the remainder of the sample; the researchers defined significance ($p \leq 0.01$). They used Williamson's method for examining how each hospital structure and process of intensive care was related to its performance (as cited in Knaus et al., 1986).

In the study findings, Knaus et al. (1986) reported that the age, severity distribution, and diagnoses of patients were similar for most hospitals. Excluding selected surgical procedures, significant differences in frequency of individual diagnosis were not substantial. Each hospital sample ranged from 159 patients to 1,657 patients; only one hospital exceeded 500 patients ($N=5030$). To compare the hospitals on their predicted and actual mortality rates, the researchers ranked the 13 hospitals, according to their ratio of actual to predicted deaths. A ratio of approximating one indicated that the hospital performance approximated the average of the sample or that the actual and estimated death rates were similar. A ratio of less than one indicated an above average performance; conversely, a ratio greater than one indicated a below average performance. The relative ability of the hospitals to treat patients differed significantly. The number one ranked hospital performed significantly better ($p < 0.001$) than all other hospitals, with a death rate 41% less than predicted. Hospital 13 did significantly worse ($p < 0.001$) with 58% additional mortalities than was predicted. The effect of single hospitals on outcome was quite significant, $\chi^2(12, N = 13) = 62.9, p < 0.0001$, when the researchers controlled for APACHE II scores, medical and post surgical diagnosis, and emergency surgery status. The researchers continued:

Most importantly, outcomes in Hospitals 1 and 13 differed significantly ($p < 0.0001$) from those in a reference group of 10 hospitals. Hospital 4 had a better outcome than the remaining 10 hospitals but with a significance level ($p = 0.03$) greater than our statistical threshold. (p. 412)

Knaus et al. (1986) next compared the performance of the 13 hospitals for only nonoperative admissions. The researchers reported that the ratio of observed deaths to predicted deaths ($n = 2314$) was consistent for the total number of patients ($r = 0.91$). Last the researchers compared outcomes in all hospitals within six of the most frequently identified diagnostic categories. Within each of these categories the performance of the 13 hospitals was consistent with their overall ranking.

Knaus et al. (1986) evaluated the relationship between the percentage of critically ill patients treated by a hospital and the hospital performance using an APACHE II score of greater than 15 as the point for defining a midlevel degree of severity. While each of the 13 hospitals treated a large number of patients with scores at or exceeding 15, the percentage of patients scoring 15 or greater did not correlate with its general performance ranking. The researchers stated:

At each hospital, however, the ratio of predicted to observed mortality for these severely ill patients matched its performance with the entire sample [T]hese findings suggest that the differences in outcome were not limited to one particular diagnostic or surgical group or to level of severity of illness, but involved several categories of patients. (Knaus et al., 1986, p. 414)

Knaus et al. (1986) reported the findings on the individual unit structural characteristics and the processes of care. The 13 hospitals were analyzed according to their administration of the ICU: (a) No statistically significant difference was present in either the average mortality of the nine Level I units and the two Level II or two Level III units or in the average mortality of teaching and nonteaching hospitals. The total number of daily “therapeutic intervention points” given during the stay after controlling for the type and seriousness of the patient illness was similar at 12 of the 13 hospitals

(p. 414). The outlier hospital averaged 40% more points per patient. This average differed significantly from that in the other hospitals (t -ratio = 4.74, p = 0.01).

The researchers reported that significant differences, difficult to explain, existed in the interaction and coordination of staff. They posited that contrasting Hospitals 1, 3, 4, and 13 might be the best way to show this difference. Hospital 1 and Hospital 4, both Level I, had all the structure and process elements graded positively. Hospital 1 used carefully designed protocols, had the most developed nursing education support system, and exhibited excellent communication between physician and nurses so that “all patient care needs were met” (Knaus et al., 1986, p. 415). Hospital 4 also had a “high degree of coordination of care among its intensive care staff, although it did not make use of clinical protocols” (Knaus et al., 1986, p. 415). The researchers also surmised that the “mortality ratio (actual to predicted deaths) might have been significantly lower had we sampled a larger number of patients” (Knaus et al., 1986, p. 415). Hospital 3 and Hospital 13, Level III hospitals, did not have dedicated unit physician staff to impact admission, discharge, and treatment decisions. The nursing staff at Hospital 3 had extensive educational program and exhibited high levels of collaboration with physicians. Private attending staff consulted with nurses on admission, discharge, and treatment decisions. Hospital 13 lacked a comprehensive nursing organization: no central nursing authority, formal nursing education program, and no plan for continuity of primary nursing care. Additionally, there was poor communication and collaboration of admitting physicians and nursing staff: “There was no direct coordination of staff capabilities with clinical demands. Frequent disagreements about the ability of the

nursing staff to treat additional patients occurred, and there was an atmosphere of distrust” (Knaus et al., 1986, p. 416).

Sherwood et al. (2002) summarized the study findings of the 5,030 ICU patients from 13 hospitals:

55% more patients in the “best” units lived than were expected to live. In the “worst” units, 58% more patients died than were expected based on APACHE scores. The significant differences between the best and the worst units were the interaction and coordination of the care providers, yet no real changes in care delivery have been made to change the pattern of interaction and teamwork to produce better outcomes. (p. 335)

Knaus et al. (1986) demonstrated that the important outcome of mortality which measured quality of care, was not related significantly to structure or care processes but to the interaction and coordination of those who provided care. In a group of ICUs, those with collaborative cultures could deliver higher clinical outcomes without higher costs for structure and staffing. The reduction of these costs could be passed onto the consumer.

Ohlinger, Brown, Laudert, and Fofah (2003) conducted a qualitative study to assess the organizational culture in two Vermont neonatal intensive care units (NICU). The purposive sample was selected by a NICU organization called CARE, an acronym for communication, accountability, respect, and empowerment. The CARE group was to facilitate the development of cultures supportive of change, teamwork, and improvement among four NICUs, located throughout the U.S. To assess the organizational cultures of NICUs belonging to the CARE group, CARE administered a quantitative unit culture survey. Ohlinger et al. (2003) described the survey findings summarized by the CARE group: (a) The unit cultural structures were hierarchical; (b) staff believed that they had little input in decision making but wanted more; (c) staff did

not view their individual work as part of an entire system; (d) a lack of trust existed between management and staff; (e) the staff did not trust that conflicts could be resolved; (f) great variation existed in the goals and skills of conflict resolution; and (g) people did not use their conflict resolution skills.

Following receipt of survey results from the four NICUs, CARE selected the two Vermont NICUs with which to benchmark and to further examine their multidisciplinary teamwork. CARE group members collected data during phone interviews and site visits paid to the two benchmarking sites. During the visits, the data collectors observed multidisciplinary team meetings and staff interactions during their shifts. They also interviewed representatives from all levels and disciplines on the NICU.

Ohlinger et al. (2003) explained that following the survey analysis, a literature review analysis, and best practice site visits, the CARE group produced a list of potentially better practice themes through cross case analysis: (a) clear and shared vision and values; (b) effective communication between individuals and teams; (c) leadership by being a model; (d) nurture of a collaborative environment by trust and respect; (e) accountability to standards of conduct and excellence; (f) promotion of competent and committed teams; and (g) commitment to conflict management.

Shortell, Zimmerman, Rousseau, Gillies, Wagner, Draper, et al. (1994) conducted a correlational study to examine the relationship of performance to certain managerial and organizational practices. The four independent variables were: (a) availability of technology, (b) the diversity of required tasks, (c) adequacy of staffing, and (d) the communication and teamwork of the caregivers. The dependent variables

were performance outcomes of risk-adjusted mortality, risk-adjusted length of stay, nurse turnover, evaluated technical quality of care, and evaluated ability to care for family members.

Shortell et al. (1994) identified four hypotheses: (a) The more available the technology was on a unit, the better the unit performance, especially related to risk-adjusted mortality treated on the unit; (b) the more diverse the conditions treated in the ICU, the lower the unit performance, especially related to risk-adjusted mortality; (c) the better the nurse to patient staffing ratio, the higher the unit performance; and (d) the higher the quality of caregiver interaction among medical staff and nurses in the unit, the higher the unit performance, particularly regarding effectiveness of utilization, assessed quality of delivered care and assessed capability to meet family member needs.

Shortell et al. (1994) collected data from a stratified random sample of medical surgical ICUs at 26 hospitals selected by bed size, geographic region, and teaching status. An additional 14 hospitals volunteered for the study. Following an analysis of the variables, which showed no significant differences between the volunteer and the sampled ICUs, the two groups were analyzed as one group. The researchers collected data on 17,440 patients from May 1988 until February 1990.

To compare hospital outcomes, Shortell et al. (1994) controlled for the patient severity through risk adjustment of unit data. Shortell et al. (1994) calculated each unit expected mortality rate adjusted on patient demographics, physiologic or clinical measures, and other characteristics using APACHE, an accepted risk-adjustment system. Using a similar prediction equation, the researchers also determined an expected length of ICU stay. After risk-adjusting to account for sicker patients tending

to die during the first day in ICU, the researchers measured their second outcome measure, length of stay.

Shortell et al. (1994) collected much of the performance outcome data on an organizational assessment questionnaire from all physicians and caregivers on all shifts. The researchers measured the dependent variable, evaluated technical quality of care, by the following items: (a) the capability to succeed as a team; (b) the capability to employ the most current available technology; and (c) the degree to which the patient treatment goals were achieved. The researchers measured the patient satisfaction outcome by asking the providers two questions to rate how well they thought their family members' needs were met. The survey used a five-item Likert-type scale: 1 (*strongly disagree*), 2 (*disagree*), 3 (*neutral*), 4 (*agree*), and 5 (*strongly agree*). The internal consistency reliability was assessed Cronbach's alpha, which was measured as .75. The researchers reported the return rate was greater than 65% ($N = 2319$). Shortell et al. (1994) also assessed staff satisfaction with nurse turnover statistics from each ICU.

Shortell et al. (1994) measured the first independent variable, available technology, by assessing the percentage of 39 items recommended by National Institute of Health Critical Care Medicine Consensus Panel and other organizations. The researchers validated the self-reported data by site visits to nine ICUs. Units averaged 80% of the equipment. Shortell et al. (1994) evaluated the second dependent variable, the diversity of required tasks in the ICU. For this measure, the researchers counted for each ICU the number of the 78 major disease categories listed in the Apache III Prognostic System. Shortell et al. (1994) assessed the third independent variable, nurse staffing on each shift, from items on the Background/Structure Questionnaire completed

by each unit nursing director. The researchers quantified the fourth independent variable, dimensions of caregiver interaction, by measuring the discrete dimensions of caregiver interaction, culture, leadership, communication, coordination, and problem solving/conflict management through the subscales of the organizational assessment questionnaire described previously. The researchers piloted the subscales in five ICUs with responses from 134 nurses and 53 physicians. As a result of the pilot, the researchers developed different questionnaires for physicians and nurses and revised some items.

Shortell et al. (1994) measured unit culture by 48 items selected from the Organizational Culture Inventory (OCI). While the authors did not cite specific validity and reliability statistics, they referenced Cooke and Rousseau:

Of the available measure of culture, the OCI is the most widely tested regarding reliability and validity and has demonstrated stable factor solution across samples (as cited in Shortell et al., 1994 p. 516). The items yielded three factors: (a) a team satisfaction-oriented scale; (b) a people security-oriented scale; and (c) a task security-oriented scale . . . Shortell, Rousseau, Gillies et al. (1991) established that the rotated factor loadings for the team satisfaction-oriented scale (principal components analysis, varimax rotation) ranged from .47 to .78 with an eigenvalue of 13.02. (as cited in Shortell et al., 1994, p. 516)

To evaluate convergent and discriminant validity, Shortell et al. (1994) correlated the team satisfaction factor with nursing and medical leadership, effective communications, collaborative problem solving and conflict management, and team unity. Shortell et al. (1991) reported that all “relationships were statistically significant in the predicted direction” (as cited in Shortell et al., 1994, p. 516). The researchers also identified Cronbach’s alpha for the team-satisfaction culture dimension as .94.

The researchers (Shortell et al., 1994) measured the caregiver interaction dimension of nursing and physician leadership with separate eight-item scales, which

evaluated the extent to which unit leaders emphasized excellence to their staffs, communicated clear goals and expectations, and understood unit members' needs and perceptions. Cronbach's alpha for the nursing scale was .87 and for the physician scale was .88. They also measured caregiver interaction dimension of communication through items assessing openness, accuracy, timeliness, understanding, and satisfaction. The researchers, due to these items being highly correlated, selected timeliness of communication to be measured by three items. For the timeliness of the communication scale, Cronbach's alpha was .64. They measured the caregiver interaction dimension of coordination between units by a four-item scale. Cronbach's alpha was .75 for the between unit coordination scale. The Cronbach's alpha of a four-item scale, which measured the caregiver interaction dimension of open-collaborative problem-solving attitudes and behaviors, was .82. The researchers computed a composite score by aggregating and averaging the subdimension scores with all dimensions given equal weights; Cronbach's alpha for the composite score was .89.

Shortell et al. (1994) performed correlation measures on all outcome measures. Because these measures were not highly correlated, the researchers explained that the multiple indicator approach was justified. The researchers tested the hypothesis by performing least squares regression. They reported the mean for the ICU mortality rate was 16.6% (range = 6.2%-40%). They also collected risk adjustment data on the expected length of stay: the mean ICU length of stay was 4.7 days (range = 3.3-7.3 days).

Shortell et al. (1994) reported that hypothesis one was supported: The greater the technological availability on a unit, the lower its risk-adjusted mortality rate. The

beta, standardized coefficient (in standard deviations of both dependent and predictor variables) for the regression of the predictor variable of technological availability on risk-adjusted mortality was $-.42$ ($p \leq .05$). The researchers also reported that the second hypothesis was supported: The more diverse the conditions treated in the ICU, the lower the unit performance, especially related to risk-adjusted mortality. The beta for the regression of the predictor of diversity of care tasks on risk-adjusted mortality was $.46$ ($p \leq .01$). The third hypothesis was not supported: Nurse staffing was not significantly associated with risk-adjusted mortality. The fourth hypothesis was supported: The higher the quality of caregiver interaction among medical staff and nurses in the unit, the higher the unit performance, particularly regarding effectiveness of utilization, assessed quality of delivered care and assessed capability to meet family member needs. The beta for the regression of caregiver interaction with risk-adjusted ICU length of stay was $-.34$ ($p \leq .05$). The beta for the regression of caregiver interaction with evaluated technical quality of care provided in the unit was $.81$ ($p \leq .01$). The beta for the regression of caregiver interaction with evaluated ability to meet family needs was $.74$ ($p \leq .01$).

Shortell et al. (1994) stated that the positive relationship of caregiver interaction with risk-adjusted length of stay was important. The finding suggested that ICUs with team-oriented cultures and with a collaborative management approach to problem solving and conflict were significantly more efficient in terms of treating patients successfully. The successful treatment allowed caregivers to transfer patients out of ICU to less intensive and costly levels of care. Hospitals with such collaborative units also saved more resources because nurse turnover was lower. Lower turnover meant

that hospitals saved money from reduced recruitment and orientation. These findings of reduced costs and nurse retention, highly relevant to this research, are the synonymous, quintessential outcomes of a future reformed health care system.

Wheelan, Burchill, and Tilin (2003) reported a correlation study which examined the relationship between the degree of self-reported teamwork in an ICU and patient outcomes. To frame the study, the researchers identified the following research questions: “Is there a relationship between certain individual organizational demographic data in ICUs and staff members’ perceptions of unit productivity? Is there a relationship between the level of group development in ICUs and patients’ outcomes?” (p. 528).

Wheelan et al. (2003) invited 50 hospitals to participate in the study; 17 ICUs in 9 hospitals on the East Coast of the United States completed the study. The researchers collected a variety of data: (a) Staff ($n = 394$) completed the Group Development Questionnaire (GDQ) and a demographic survey; (b) hospital leaders answered questions regarding the hospital characteristics; and (c) leaders of each ICU submitted (a) unit Acute Physiology and Chronic Health Evaluation (APACHE) III Mortality Prediction results, collected from one month ICU admissions, and (b) the standardized mortality ratio (SMR), collected from medical record review of the admissions. Citing the 1996 research of Wheelan and Hochberger regarding the GDQ, the researchers stated that test-retest correlations, the internal consistency of each scale, and concurrent validity was evaluated; all correlations were highly significant (as cited in Wheelan et al., 2003). Wheelan and Hocberger also evaluated criterion-related validity; work groups scoring high on productivity measures had significantly higher scores on GDQ

scales III and IV, the effectiveness mean, and on the productivity mean than did groups which scored low on the external productivity measures. Groups that scored higher on organizational productivity measures had significantly lower scores on the GDQ scales I and II (as cited in Wheelan et al., 2003). Citing Wheelan, Murphy, Tsumura, and Kline; Wheelan and Tilin; Whellean and Lisk, the researchers concluded “Thus, work groups at higher stages of development were more effective and productive” (as cited in Wheelan et al., 2003, p. 530).

The 60-item GDQ, based on the Integrated Model of Group Development, was comprised of four scales of 15 items each. The four scales corresponded to the four stages of group development set forth in the Integrated Model of Group Development: Dependency/inclusion, Counterdependency/fight, Trust/structure, and Work and productivity. The responder scored each item from 1 (*never true of this group*) to 5 (*always true of this group*). An effectiveness ratio was determined by dividing a team actual mean score on the Work scale by its maximum possible scale (75).

Wheelan et al. (2003) employed the APACHE III system for a month to predict a patient’s risk of dying in each ICU. They used the risks for each patient to establish the standardized mortality ratio (SMR) for each unit, a unit measurement that was calculated by dividing each unit mortality by the predicted mortality rate. A SMR greater than one indicated that the recorded death rate was higher than predicted; a SMR less than one indicated that the death rate was less than predicted. Citing studies by Feiger and Schmitt and Knaus, Draper, Wagner, and Zimmerman, Wheelan et al. (2003) stated, “Although some researchers have questioned the use of the SMR as a quality

measure in ICU's, few measures of patients' outcomes have been as thoroughly tested as APACHE III" (as cited in Wheelan et al., 2003, p. 530).

To analyze the data, the researchers (Wheelan et al., 2003) performed Pearson product moment correlations and analysis of variance (ANOVA) to examine any relationship that existed between any ICU demographic data at an individual or unit level and staff members' perceptions of productivity. They also correlated the number of participants in each unit with the unit SMR and stage of group development.

Wheelan et al. (2003), who did not explain the inclusion criteria, reported the study findings from the 17 ICUs in nine hospitals. Demographic information included: (a) Twelve of the 17 ICUs employed the APACHE III system for risk adjusting; (b) 75% of the participants were registered nurses; 25% of the respondents were physicians, unit clerks, and unlicensed assisting personnel; (c) the respondents were comprised of the following categories: 80% were women and 20% were men; 70% were between 20 and 40 years old; and (d) 42% had graduated from a four-year college; 31% had associate degrees, and 5% had masters degrees.

Of thirteen demographic categories, only three categories were related significantly to GDQ scales: (a) Education level was significantly related to the GDQ Scale II [$F(6.38, n = 13) = 3.11, p = .005$]: post hoc test demonstrated that the 18 registered nurses who had attained masters degrees perceived significantly higher amounts of unit conflict than other staff members; (b) participants with longer professional tenure tended to view units as having more conflict with unit leaders and staff members ($r = .111, p = .05$); and (c) older staff members viewed their units as more productive ($r = .112, p = .05$).

Wheelan et al. (2003) noted no significant correlation between the participant number and the unit SMR and group stage development. The relationship between a unit stage of group development and the unit SMR was statistically significant ($r = -0.662, p = .004$). To further study this relationship, they divided the 17 ICUs into 3 subgroups: low-SMR/high performing, middle-SMR/high performing, and high-SMR/low-performing groups. The ANOVA established significant differences in the SMR results of the units within each subgroup. The researchers stated:

In addition, the mean stage of group development within each subgroup differed significantly from the mean stage in the other two subgroups. That is, staff members of ICUs with low SMR rates perceived their staff group as functioning at higher stages of group development than did staff members of ICUs with midrange or high SMRs. (p. 532)

On the individual level analysis, Wheelan et al. (2003) found that the ANOVA evidenced significant differences among the three subgroups on three of the four GDQ scales and group scales. On GDQ Scale I, staff of low-SMR/high performing ICUs conceptualized their staff groups as significantly less dependent than did members of middle-SMR /middle performing ICUs and high-SQM/low-performing ICUs ($F = 5.542, df = 383, p = .004$). On GDQ Scale II, staff of low-SMR/high performing ICUs conceptualized their staff groups as less engaged in conflict with those in authority than did staff in midlevel-SMR/low performing ICUs ($F = 5.445, df = 383, p = .005$). On GDQ Scale III, staff of low SMR/high performing and middle-SMR/middle performing staff conceptualized their units as more organized and staff members having more trust than did members of high-SMR/low-performing ICUs ($F = 4.034, df = 383, p = .02$). Last, staff of low-SMR/high performing and middle-SMR/middle performing ICUs conceptualized the groups as functioning at higher group development levels than did

members of high-SMR/low performing ICUs ($F = 124.059$, $df = 383$, $p = .001$). The researchers stated that although more research was needed, this study added more evidence between the link of teamwork and outcomes of ICU patients. The link between teamwork and clinical outcomes established by Knaus et al. (1986) is now augmented and strengthened with this study (Wheelan et al., 2003). In concluding, Wheelan et al. (2003) noted that health care workers did not receive adequate training in teamwork skills.

Clemmer, Spuhler, Oniki, and Horn (1999) reported a pre and post repeated measures trial in a 12-bed shock/trauma/respiratory ICU in the Latter Day Saints (LDS) Hospital in Salt Lake City, Utah. The researchers hypothesized that improving processes in the shock/trauma/respiratory ICU would improve outcomes while simultaneously reducing costs. The purpose of the process improvements was twofold: application of quality improvement tools and statistical principles while developing a more collaborative, multidisciplinary environment among the caregivers.

The sample (Clemmer et al., 1999) included all patients admitted to the shock/trauma/respiratory ICU from January 1991 through December 1995 ($N = 2764$). The researchers measured and adjusted the severity of the patients with the Computerized Severity Index. The severity factors were organized by diseases and included the following levels: (a) Level 1, normal to mild; (b) Level 2, moderate; (c) Level 3, severe; and (d) Level 4, catastrophic or life threatening. They (Clemmer et al., 1999) collected additional data: (a) the patient age gender; (b) hospital lengths of stay and mortality; (c) all principle and secondary International Classification of Diseases-9 codes; and (d) the true costs of care from the finance systems by estimating the costs of

all tasks, procedures and tests using data of motion studies, average salaries, supply costs, and equipment depreciation.

In 1992, Clemmer et al. (1999) implemented the planned intervention of applying quality improvement (QI) processes to intensive care practice. The researchers affirmed that formal QI projects were initiated in the following processes: sedation and paralysis, family orientation, parental feeding, stress ulcer prophylaxis, heparin therapy, brain edema therapy, potassium maintenance and replacement, enteral feeding, supply use, glucose control, brain death protocol, antibiotic ordering, ventilator protocols, and blood ordering. The protocol creation was promoted to build collaboration and key relationships among all team members. Simultaneously, the leadership worked to change the unit culture; among other teambuilding activities, the ICU personnel participated in a vision development retreat.

Clemmer et al. (1999) analyzed the data for each year from 1991 until 1995 with a number of statistical tools. The researchers used chi-square tests to examine the changes in distribution of the severity of illness, two-sample *t* tests to analyze the changes in length of stay across the years, and multiple linear regressions to control for severity. During the five-year period, the severity of illness significantly increased with the percent of the population in the Admit Severity Index 4 category increasing from 39% to 53% whereas the Admit Computerized Severity Index 1 group decreased from 20% to 9% (chi-square, $p < .0001$). The researchers reported that while the severity and the mortality rate increased, the change was not significant after controlling for admission severity ($p > .35$). The increase in length of stay was accounted for by an increase in illness severity and was not statistically significant. Total hospital costs in

1991 dollars unadjusted for severity were not significantly different by year. Data generated from care affected by the ICU QI teams demonstrated a cost decrease, despite an increase in patient acuity severity. When they controlled for severity by examining only Max Computerized Severity Index 4 patients, the researchers found significant cost reduction in all these areas and in total costs compared with the control year 1991 ($p < .05$). The total adjusted cost reduction was \$2,580, 981 in 1991 dollars. Eighty-seven percent of the reduction came from six cost centers.

Clemmer et al. (1999) reported quantified improvements in specific care areas: acute respiratory distress syndrome (ARDS) sedation/paralysis, glucose control, enteral feeding, antibiotic use, stress ulcer prophylaxis, brain edema protocol, laboratory utilization, blood gas utilization and X-ray utilization. The majority of these improvements resulted from the development of protocols, which also facilitated the establishment of a collaborative culture. In acknowledging the significant cost savings accompanying the QI projects, Clemmer et al. (1999) concluded: "When done properly, the application of statistical and scientific principles of standardization and quality improvement has a beneficial impact of the quality of care delivered in the critical care unit and significantly reduces costs" (p. 1774). These quality improvements were designed to promote various process standardization and collaboration. This coordination reduced costs. SBAR has the identical goal: standardization of communication and promotion of collaboration.

Baggs and Ryan (1990) used a correlational descriptive study, which assessed the relationship of collaboration to ICU nurse satisfaction and examined how collaboration and satisfaction are related to nursing education, experience, and

advanced practice. The researchers stated two hypotheses: (a) ICU nurses who practice more collaboratively are more satisfied with their jobs; and (b) when ICU nurses perceive the decision making process associated with patient transfer to be more collaborative, they have higher satisfaction levels. The researchers based their definition of *collaboration* on the Thomas framework: "ICU nurses and physicians cooperatively working together, sharing responsibility for problem-solving and decision making, to formulate and carry out plans for patient care" (as cited in Baggs & Ryan, 1990, p. 387). The independent variables were the measures of general collaborative practice in the MICU and of a specific collaboration regarding the decision to transfer patients from the ICU; the dependent variables were a general work satisfaction measure and a specific satisfaction measure with the patient transfer decision making process. Baggs and Ryan (1990) conducted their six-month study at a single medical ICU (MICU) of a large northeastern university medical center. The researchers described the sample as consisting of all 68 registered nurses (RNs) with patient assignments in the MICU during the study.

To measure the collaboration, the researchers collected the nurse responses on the Collaborative Practice Scales (CPS). The Cronbach's alpha of the CPS was 0.83. The researchers also administered the Index of Work Satisfaction (IWS) to measure nurse satisfaction with several aspects of their work including autonomy, pay, nursing relationships physician-nursing relationships, and organizational policies. Cronbach's alphas for the IWS subscales ranged from .70 to .80 indicating internal consistency. Baggs and Ryan (1990) developed the third instrument, the Decision About Transfer scale, a two-item Likert-type scale with which collaboration with physicians and the

related satisfaction of the transfer process was assessed: 1(*no collaboration, not satisfied*) to 7(*complete collaboration, fully satisfied*). The researchers did not identify reliability information of the Decision About Transfer scale. To test Hypothesis 1, the researchers performed correlations of the Collaborative Practice Scales (CPS) and the Index of Work Satisfaction (IWS). To test Hypothesis 2, the researchers performed zero-order correlation between the nurse report of collaboration and satisfaction.

Baggs and Ryan (1990) reported that Hypothesis 1 was not supported: the researchers found no significant correlations between the measure of collaborative, the CPS scales, and the measure of general job satisfaction, the IWS, or any of its subscales. The correlations between the general measures were not significant ($r = .08$). Baggs and Ryan (1990) asserted that Hypothesis 2 was supported by the data from the Decision About Transfer questionnaire and satisfaction involved in making a specific transfer decision. They reported that the zero-order correlation between nurse reports of collaboration and the amount of collaboration and satisfaction involved in making the decision was significant ($r = 0.67, p < .05$).

Baggs and Ryan (1990) also reported the effects of satisfaction on nurse retention. They studied the MICU nurses one year after the study commenced. Nineteen nurses (28%) of the sixty-eight had left. They reported that a logistic regression of retention on the general nursing satisfaction scores (IWS) demonstrated a relationship, which was not significant ($t = .28, p > .05$). When the researchers regressed retention on satisfaction, satisfaction in specific decision making was predictive of retention ($t = 2.68, p < .05$). The researchers did not report the degrees of freedom statistical information. Baggs and Ryan (1990) noted that a trend existed for

older, more educated and experienced nurses to report more collaborative practice but less satisfaction. The researchers stated that the relationship between the positive collaboration and the negative satisfaction suggested a possible interaction effect of collaboration and experience on satisfaction. The researchers investigated this effect possibility by estimation of hierarchical regressions. They first performed the regression with satisfaction (IWS) as the dependent variable and then with each IWS subscale as the dependent variable. The independent variables were entered in the following order: collaboration, as measured by the CPS; experience variable; interaction of collaboration and the demographic variables. The researchers found significant results for both the Autonomy and Organizational Policies subscales of the IWS with the variable of age and for the Autonomy subscale with “years as an RN” (p. 389). The researchers concluded: “Younger nurses positively associated more collaboration with more satisfaction with autonomy while little relationship was found between collaboration and satisfaction with autonomy in work for older nurses” (p. 390).

Baggs and Ryan (1990) identified several nursing practice implications:

(a) Collaboration was important to nurse satisfaction when making such patient decisions as transfer; (b) to less experienced nurses, general collaborative practice was important to broader nursing satisfaction; and (c) the interaction effect found in this sample suggested that collaboration was particularly important to ICU nurses because younger nurses practice in the ICU. Again, the findings of Baggs and Ryan (1990) demonstrate that decision latitude and collaboration is significantly associated with nursing satisfaction.

Variation in ICU Team Members' Perceptions of Culture and Collaboration

Melia (2001) reported a qualitative study, which explored the decision shared by the medical and nursing staffs to withdraw treatment in the intensive care unit. The researcher collected data from 24 experienced intensive care nurses from various ICUs in Scottish hospitals. The researcher recorded the interviews, informal and conversational.

Melia (2001) analyzed the data through coding the various concepts and using the iterative constant comparative method of analysis, which identified themes. One theme emerged in nearly every interview: When asked to identify the important ICU ethical issues, the nurses selected the decision to withdraw treatment from a patient. The interviews established the importance of teamwork, another theme, and the associated tendency to look for consensus in intensive care. Melia (2001) found that when disagreements related to withdrawal of patient treatment occurred, the team experienced a great deal of “strain because the issues in question are not simply organizational and matters of professional status, but rather moral questions” (p. 717). She concluded that the nurses conveyed a stronger need for team decisions and consensus than physicians. Already noted (Vazarani, 2005), the differences in physician and nurse perceptions and preferences of collaboration will be explored further in this subsection.

Coombs (2003) conducted an ethnographic study in the United Kingdom to explore decision making in the ICU. Her purpose was to develop a “critical awareness” of the contributions and perceptions of medicine and nursing related to clinical decision making (p. 125). The researcher selected a purposive sample of three ICUs, which she judged would provide detailed and descriptive information. The units were located in

general hospitals and medical school affiliated hospitals. Combs (2003) reported that the “micro ethnographic research design” (p. 128) study design was a fieldwork model of two phases: In Phase One, the researcher became oriented to the field site, selected key participants, collected data in the field, and observed rounds and interactions at the bedside. In Phase Two, the researcher conducted 18 in-depth ethnographic interviews, 200 hours of participant observations, and reviews of the literature and 62 documents.

Following coding and inductive analysis of the collected data, Coombs (2003) noted that the data collection and data analysis occurred concurrently due to the ethnographic nature of the research. By employing the techniques of theoretical sensitivity, theoretical sampling, constant comparative analysis, and transcription of theoretical notes, she completed a three-phase data analysis through in vivo and axial coding, core category and proposition development, and theory development. Through this process, three thematic categories emerged. The first two themes concerned the diverse knowledge and roles used in clinical decision making. The researcher explicated the third theme, power and conflict in clinical decision-making. She noted that while many perceptions of mutual working relationships were expressed, “an enduring observation across the data concerned control and input into the decision making process” (p. 129). Nurses believed that physicians controlled clinical decisions with little influence by nurses; physicians seemed oblivious to the ways that they shaped the nursing role in the clinical area. Coombs (2003) stated that physicians expected the nurses to have intimate knowledge of the patient. The researcher, however, provided quotations exemplifying how the nurse assessment of the patient was ignored when the physician made treatment decisions:

In ignoring these fundamental principles in the nursing philosophy and knowledge base, the power of medicine's knowledge over nursing power in medical knowledge was displayed. Power in medical knowledge was also demonstrated through nurses being largely unquestioning and unchallenging of the medical management plan. (p. 130)

Coombs (2003) posited that physicians viewed nurses as tangential to the rounds process. Examples of nursing input being ignored, discounted, and not sought during the rounding process were seen at all three sites. These examples demonstrated the physician power which nursing lacked. Coombs (2003) concluded that the traditional hierarchies continued and that the contributions of nursing were limited by physicians and by nurses, themselves. Contrary to limiting collaboration, input, and decision making, the SBAR communication protocol defines, validates and mandates nurse assessment, input, and recommendation.

Thomas, Sexton, and Helmreich (2003) reported a quasiexperimental study to assess and compare critical care physician and nurse attitudes about teamwork. The researchers defined teamwork and collaboration interchangeably: "[T]o communicate and make decisions with the expressed goal of satisfying the needs of the patient while respecting the unique qualities and abilities of each healthcare provider" (p. 957). The independent variable was the role of either nurse or physician; the dependent variable was the perception of teamwork with one another. Physicians comprised one group, and nurses formed the other group.

To measure team attitudes, Thomas et al. (2003) selected the Intensive Care Unit Management Attitudes Questionnaire (ICUMAQ), adapted from the Flight Management Attitudes Questionnaire. The researchers gave no detail on reliability or validity measures of either questionnaire. Thomas et al. (2003) administered the ICUMAQ to

all physicians and nurses on eight nonsurgical ICUs in six hospitals within the same Texas medical system. Two hospitals had two medical ICUs each; two hospitals were affiliated with medical schools. In 1999-2000, Thomas et al. (2003) surveyed the staff at all hospitals. The researchers sent a total of three mailings in 2-week intervals. Because the community-based physicians had a low response rate, the researchers sent wave mailings of a postcard reminder, a phone call, and an additional survey.

Thomas et al. (2003) used factor analysis and reliability analysis to develop a seven-item scale measuring the teamwork climate. The teamwork climate scale had a Likert-type scale from 1 (*disagree strongly*) to 5 (*agree strongly*). The researchers reported that the teamwork climate scale had high internal consistency (Cronbach's alpha = .78) and face validity. The researchers used this scale to examine physician and nursing perceptions of teamwork with one another. The researchers calculated the mean of responses for each item and used multivariate analysis of variance (MANOVA) to test for differences between physician and nursing responses both to the overall survey and to each item individually. The researchers analyzed the differences between physicians and nurses on the teamwork climate scale with analysis of variance (ANOVA).

Thomas et al. (2003) reported that 58% of the eligible subjects responded: The physicians ($n = 90$) were predominantly male (86%); the nurses ($n = 230$) were predominantly female (92%). Thomas et al. (2003) reported that the ICUMAQ with a scale ranging from 1 (*very low quality*) to 5 (*very high quality*) asked the respondent to rate the level of collaboration and communication with each of the unit provider types. Seventy-one percent of nurses rated their collaboration and communication with other

nurses as *high* or *very high*. Correspondingly, 70% of physicians rated their collaboration with other physicians as *high* or *very high*. In contrast, 33% of the nurses rated collaboration and communication with physicians as *high* or *very high*. Seventy-three percent of physicians rated collaboration and communication with nurses as *high* or *very high*.

Thomas et al. (2003) reported that the MANOVA of the seven items on the teamwork climate scale yielded an omnibus $F(7, 163) = 8.37$ ($p < .001$). The researchers stated that this result indicated “that physicians and nurses perceived their teamwork climate differently as a function of their role on the unit” (p. 957). Five of the seven teamwork climate scale items demonstrated significant differences between physician and nursing responses: (a) “It is difficult to speak up when a provider perceives a problem with patient care” (MDs, $M = 2.09$, $SD = 1.09$; RNs, $M = 2.09$, $SD = 1.21$; $p = .006$, p. 958); (b) “decision making should include more input from other ICU personnel than it does now” (MDs, $M = 3.07$, $SD = .98$; RNs, $M = 3.83$, $SD = 1.13$; $p < .001$, p. 958); (c) “the doctors and nurses work together as a well coordinated team” (MDs, $M = 3.78$, $SD = 1.07$; RNs, $M = 2.94$, $SD = 1.20$; $p \leq .001$, p. 958); and (d) “disagreements in the ICU are appropriately resolved for what is best for the patient” (MDs, $M = 3.82$, $SD = 0.96$; RNs, $M = 3.27$, $SD = 1.19$; $p = .004$, p. 958); and (e) “input from ICU nurses about patient care is well received in this unit” (MDs, $M = 4.06$, $SD = 1.00$; RNs, $M = 3.38$, $SD = 1.22$; $p \leq .001$, p. 958). Thomas et al. (2003) reported that the ANOVA demonstrated differences in teamwork climate scale scores between physicians and nurses ($F[1, 169] = 16.74$; $p < .001$), and nurse scores ($M = 3.23$) showed less satisfaction with teamwork climate than physician scores. Clearly,

these findings show a disparity between physician and nurse assessment of a collaborative ICU culture. Most of these significantly different perceptions relate to the themes of nurse input and inclusion in the care process. These American nurses (Thomas et al., 2003) echo the perceptions of their United Kingdom counterparts (Coombs, 2003): Nurse input neither is sought nor valued by physicians making care decisions (Coombs, 2003). Physicians assess their collaborative behaviors with nurses as significantly more positive than nurses assess their collaboration with physicians (Thomas et al., 2003). Interestingly, physicians assess their collaboration with nurses as higher than with their fellow physicians. While diverse professional attitudes toward collaboration is well documented in this study as well as subsequently reviewed studies, the nuances of why and in which groups these differences exist is not addressed in these studies. Clearly, broader knowledge and understanding of the disparate attitudes as it relates to age, role, and gender would augment the understanding of collaboration.

Baggs, Schmitt, Muslin, Mitchell, Eldredge, and Oakes (1999) conducted a correlational study to investigate the relationship of ICU physician and nurse collaboration, the independent variable, and patient outcome, the dependent variable. This study was a replication of a 1992 medical intensive care unit study conducted by Baggs, Ryan, Richeson, and Johnson (as cited in Baggs et al., 1999). In the earlier study, the researchers reported a linkage between the amount of nurse-reported collaboration and negative outcomes of either readmission to the ICU or death: The higher the collaboration nurses reported, the lower the risk of a negative outcome (as cited in Baggs et al., 1999). Baggs et al. (1999) explained that the second study included additional types of ICU specialty units to assess for generalizability: The ICU

units included a 20-bed surgical ICU (SICU) in a university teaching hospital, a 16-bed medical ICU (MICU) in a university affiliated community hospital, and a 7-bed medical surgical ICU (CHICU) in a community nonteaching hospital. The researchers proposed two hypotheses: (a) Health care provider reports of more physician-nurse collaboration in making transfer decisions were associated with a lower risk of negative patient outcomes (death and/or readmission to the ICU), controlling for illness severity; and (b) ICUs with a higher level of unit collaboration score would have better patient outcomes.

Baggs et al. (1999) focused their study on physician and nurse perceptions on the decision to transfer patients, who had no limitations on aggressive life support from the ICU to the non-ICU ($n = 1432$). In the SICU and the MICU, the sample was comprised of resident physicians ($n = 63$), attending physicians ($n = 97$), and staff nurses ($n = 162$) (The CHICU, not affiliated with a medical school, had no resident or attending physicians or student nurses). One hundred sixty-two staff nurses completed the survey. The researchers measured collaboration at the *patient decision level* with the Collaboration and Satisfaction about Care Decisions Questionnaire (CSACD): Two items measured global perceptions of collaboration; six items, called critical attribute questions, focused on important dimensions of collaboration; and a seven-item scale measured provider perception of collaboration related to the decision to transfer. During the data collection period, the patient providers completed a CSACD questionnaire for any patient who met criteria and was designated for transfer. Baggs in 1994 and Baggs and Schmitt in 1995 (as cited in Baggs et al., 1999) stated that the CSACD previously had demonstrated content and construct validity and reliability. Baggs et al. (1999) reported alpha reliabilities for the three ICUs ranged from 0.90 to

0.96. Baggs et al. (1999) assessed the severity of illness in the patients in the three ICUs with the APACHE III, a commonly used risk-adjustment instrument.

To measure collaboration at the *unit level*, Baggs et al. (1999) completed one-hour interviews with each nurse and physician unit administrator and a document review. The researchers scored the *unit-level collaboration*, available technology, and diagnostic diversity one point for each demonstrated unit-level collaboration variable: integrated patient records, joint practice committee, joint ICU leadership, scheduled interdisciplinary meetings, scheduled multidisciplinary patient bedside rounds, written policies supporting collaboration, interdisciplinary orientation, and interdisciplinary in-service. A perfect score was eight. Using a list compiled by Shortell et al. (1994), the researchers measured technological availability. The researchers assessed diagnostic diversity by counting the number of different disease diagnosis represented on each unit based on the APACHE III classifications.

Baggs et al. (1999) conducted a power analysis using the formulas of Hsieh and based on different provider participation rates to detect collaboration at the same effect size as the earlier study. They reported that power ranged from 0.53 to 0.79. The researchers analyzed the data with multiple regressions and multiple logistic regressions for dichotomous, dependent variables. The researchers utilized analyses of variance (ANOVA) to test for differences among the units, with post hoc Scheffe's testing to identify differences ($p < .05$). They controlled for severity of illness in all regression analyses by using the APACHE III predicted risk of mortality from the admission day to the ICU.

Baggs et al. (1999) reported that Hypothesis 1 was partly supported:

Collaboration was related to a lower risk of negative outcome. In patient-level analyses, a positive linkage between collaboration and patient outcomes was found in the MICU using nurse assessments of collaboration. This linkage replicated the earlier cited study by Baggs et al. (as cited in Baggs et al., 1999). In the bivariate logistic regressions analysis, the MICU nurses reported that collaboration significantly predicted positive patient outcome, following “controlling for disease severity ($n = 428$; increase in chi-square of $29.9 - 25.6 = 4.3$; $p = .037$)” (p. 1994). To further assess this result, collaboration was regressed on dummy codes for individual nurses. After deleting a particular nurse’s data, the researchers regressed the outcome on collaboration and risk. Nurse reports of collaboration continued to be significantly associated with outcome ($n = 426$; $\beta = -.94$; $p = .05$). Residents and attending physician reports of collaboration was not significantly correlated to patient outcomes at any of the ICUs. The nurse reports of collaboration in the SICU and CHICU were not correlated to patient outcomes. Baggs (1999) reported that Hypothesis 2, which concerned the relationship of unit-level collaboration and outcomes was supported. A perfect rank-order correlation was demonstrated between unit collaboration scores and patient outcomes. The unit collaboration scores were 3.5 in the MICU, 2.5 in the SICU, and 1 in the CHICU. The MICU had the highest score on the unit-level collaboration measure and the lowest (best) ratio of actual negative outcome to predicted mortality. The SICU was in the middle on both measures, and CHICU occupied the bottom position on both lists.

Baggs et al. (1999) questioned the exclusive relationship of the nurse reports of collaboration to patient outcomes; no such relationship existed with the residents or attending physician. The researchers suggested that the nurse reports might have reflected their method of influencing decision-making or their experience of reducing the stress effects related to transfer or that nurse reports are a more sensitive indicator of collaboration. As stated (Baggs et al. 1999; Thomas et al., 2003) nurses perceived collaboration differently than physicians. An examination of these diverse attitudes would add knowledge to this topic.

King and Lee (1994) reported a correlative study to examine the difference in perceived use of collaborative practice by Navy nurses and physicians in the ICU. The independent variable was care provider role of physician or nurse; the dependent variable was the perception of collaboration. Due to the military rank structure and the collegial relationship which existed between Navy nurses and physician, the researchers hypothesized that a greater likelihood of collaborative behavior between Navy nurses and physicians would exist in the ICU. The researchers identified cooperativeness/assertiveness as the basis that is necessary for collaborative practice to occur.

King and Lee (1994) collected data over a six-month period from all Navy nurse and physicians assigned to general, respiratory, surgical, medical, and coronary adult ICUs at the four Navy teaching hospitals and two hospital ships. The researchers used a power analysis to identify that a sample size of 98 nurses and 98 physicians was required for a power of .80, an effect size of .40, and an alpha of .05 for a *t* test. The response rate was 71% ($N=139$). The researchers used two instruments to measure the independent variable, perceptions of collaborative practice. The researchers employed

Part 1 of the Collaborative Behavior Scale (CBS) to determine the extent of collaborative behavior that nurses and physicians perceived existed between them in their work settings. Respondents scored each item of the 20 Likert-type on a four-point scale ranging from 1 (*rarely*) to 4 (*always*). The CBS internal consistency was .96. The researchers also cited reliability measures using Cronbach's alpha with item-total correlations ranged from .78 to .90 and a standardized item alpha of .98.

King and Lee (1994) also utilized the Collaborative Practice Scale (CPS), which was comprised of one scale for nurses and another for physicians. The nine-item nurse scale was scored on a six-point Likert-type scale, ranging from 1 (*never*) to 6 (*always*). The CPS nurse scale assessed two factors: (a) the extent which a nurse directly demonstrated professional expertise and point of view when interacting with a physician regarding a patient's care; and (b) the extent to which a nurse clarified with physicians their mutual expectations regarding shared responsibilities of a patient's care. The CPS physician scale also assessed two factors: (a) to which a physician recognized and valued the contributions of nursing to patient care; and (b) the extent to which physicians sought consensus with nurses regarding patient care goals. The researchers reported acceptable internal consistency reliability: Cronbach's alpha was .83 for nurses and .85 for physicians.

King and Lee (1994) analyzed the responses using descriptive and inferential statistics. They employed a *t* test to test for differences between mean scores for nurses and physicians on the CBS—Part 1. The researchers also utilized a *t* test to test for differences between mean scores on the nurse CPS and adjusted mean scores on the physician CPS.

The researchers collected data from 90 Navy nurses and 49 Navy physicians from the six collection sites. The nurse group was 89% female ($n = 80$); the physician group was 96% male ($n = 48$). In the CBS analysis, the t test showed a significant difference between the mean scores of the nurses and physicians ($t = 5.4, p < .0001$). The researchers did not report degrees of freedom statistical information. The researchers reported that the power of this analysis was .99. Physicians reported perceiving significantly greater collaboration than nurses. In the CPS analysis, the researchers reported that the t test showed no statistical difference in the adjusted mean scores of the nurses and the physicians at the .05 level ($t = .86, p = .39$). The power achieved in this analysis was .36. The CBS analysis with its power of .99 demonstrates that Navy physicians, similar to their civilian counterparts (Thomas et al., 2003; Baggs et al., 1999), assessed that significantly greater collaboration existed in their units than did nurses.

Miller (2001) conducted a case study with a survey to assess the level of collaboration in a 22-bed medical surgical ICU in the Midwest. The independent variables included the following group pairs: (a) nurses and physicians; (b) those who attended multidisciplinary meetings and those who did not; (c) day and night shift nurses; (d) less and more experienced nurses; and (e) primary and specialty care physicians. The dependent variables were the collaboration scale totals. The researcher defined collaboration according to Shortell, Zimmerman, Rousseau, Gillies, Wagner, Draper, et al. as “a composite concept which . . . includes subdimensions involving unit culture, leadership, communication, coordination, and problem solving/conflict

management (as cited in Miller, 2001, p. 342). The researcher listed the research questions, which guided the assessment:

- (a) “What is the perception of the unit’s staff of the level of collaboration in the unit, including physician leadership; communication, openness, timeliness, and satisfaction; problem solving; physician expertise; meeting effectiveness; and technical quality of care?” (p. 342);
- (b) “Do differences exist between various groups in the unit in perceptions of collaborative interaction?” (p. 342); and
- (c) “How do the findings for this unit compare with those for units in the national ICU study?” (p. 342)

Miller (2001) administered an adaptation of the short form of the ICU Nurse-Physician Questionnaire to all nurses and physicians, who worked in the unit. The modification of the ICU Nurse-Physician Questionnaire, which had separate physician and nurse forms, utilized a Likert-type scale of 5 options (*strongly agree* to *strongly disagree*); the problem-solving scales ranged from *not at all likely* to *almost certain*. The researcher identified the coefficient estimates of reliability for the scales of the modified version of the ICU Nurse-Physician Questionnaire: (a) physician leadership .81; (b) communication openness within groups .88; (c) communication openness between groups .94; (d) communication timeliness .87; (e) communication satisfaction .85; (f) problem solving within groups .88; (g) problem solving between groups .91; (h) physician expertise .69; (i) meeting effectiveness .81; and (j) technical quality of care .88.

Miller (2001) analyzed with descriptive statistics the first question: “What is the perception of the unit’s staff of the level of collaborative interaction in the unit problem solving; including physician leadership; communication openness, timeliness, and satisfaction; problem solving; physician expertise; meeting effectiveness; and technical quality of care?” (Miller, 2001, p. 344). To address the second question: “Do

differences exist between various groups in the unit in perceptions of collaborative interaction?" (Miller, 2001, p. 344), the researcher used multivariate analysis of variance (MANOVA). Miller performed each of the five MANOVA analyses on the following group pairs: (a) nurses and physicians; (b) those who attended multidisciplinary meetings and those who did not; (c) day and night shift nurses; (d) less and more experienced nurses; and (e) primary and specialty care physicians. The researcher calculated the F ratio with the Hotelling T statistic to determine whether differences existed between groups on survey scales. If significant differences existed, the researcher further analyzed the data by conducting analysis of variance (ANOVA) to identify the scale producing the difference. The researcher utilized descriptive statistics, including means and standard deviations (SD) to address the final question: "How do the findings for this unit compare with those for units in the National ICU Study?" (p. 344).

Miller (2001) reported that 80 of the 174 surveys were returned (return rate = 46%). Of the 80 returned surveys, 44% came from nurses ($n = 35$) and 56% came from physicians ($n = 45$). Twenty-nine percent of the responding nurses ($n = 10$) had six or less years of experience; 71% of the responding nurses ($n = 25$) had more than six years of experience. The physicians' responses comprised the following categories: (a) physicians who specialized comprised 47% ($n = 27$) and (b) physicians who delivered primary care comprised 27% ($n = 17$). To address the first research question, the researcher found that the respondents perceived that a high level of collaborative interaction existed in this unit. The possible rank for each scale was from one to five. The mean scores on the following scales were 4.05 or higher: physician leadership,

communication openness within groups, satisfaction with communication, and technical quality of care. Miller (2001) stated these scores to be “high perceptions of these aspects of interaction” (p. 345). The mean scales on the other scales were 3.25 or greater; Miller (2001) evaluated these to be “relatively high perceptions of these aspects of interaction” (p. 345).

The researcher found a significant difference in the perceptions of nurses and physicians (Hotelling MANOVA = 0.96, $F = 5.85$, $p < .001$). $T^2[F(1,63)= 5.85]= 0.96$, $p < .001$ Except for physician leadership, the physicians scored higher on every category. ANOVAs demonstrated significant differences for seven of the nine variables identified previously ($p < .01$). Only scores for communication openness within groups and physician leadership were not significantly different between nurses and physicians. Miller (2001) identified responses to two open-ended questions to be particularly revealing as to the different perceptions. The question, “If I do not receive a timely or appropriate response, the next step I take is . . . ,” augmented the communication scale. Only three of the physicians responded, but 27 of the 35 nurses completed the question. The researcher stated: “The clarity of the physicians’ responses was in sharp contrast to the collective uncertainty of the nurses’ responses” (p. 346). The physicians’ responses centered on calling the nursing manager. A second question was added to the problem solving between two groups scale: “If you have experienced conflict that has not been resolved, please indicate reason(s) resolution was not reached” (p 346). It was answered by nine nurses and two physicians. The nurses gave reasons of denial and avoidance, a doctor’s “failure to see the need,” “would not consider collaborative discussion,” “unwilling to discuss the issue,” and “did not acknowledge the problem” (p. 346).

Miller (2001) also reported significant differences between day and night shift nurses (Hotelling MANOVA = 1.06, $F = 2.84$, $p = .02$) $T^2[F(1,32)= 2.84]= 1.06$, $p = .02$. The follow-up test indicated that day shift nurses perceived higher levels of communication openness than did night shift nurses. Differences between less experienced nurses and nurses with greater than six years experience was significant (Hotelling MANOVA = 0.89, $F = 2.37$, $p = .04$) $T^2[F(1,32)= 2.37]= 0.89$, $p = .04$. The follow-up test indicated that experienced nurses perceived higher levels of communication openness and problem solving with other nurses significantly higher than less experienced nurses. Differences between primary and specialty care physicians were significant (Hotelling MANOVA = 0.89, $F = 2.37$, $p = .04$) $T^2[F(1,29)= 2.37]= 0.96$, $p = .04$. Scores of specialty care physicians were higher than those of primary care physicians on every variable except physician expertise.

To address the third question, “How do the findings for this unit compare with those for its in the national ICU study?,” the researcher presented the mean and *SD* of the case study unit and the mean and *SD* of the 42 units of the National ICU Study. The scale scores of the case study are higher than those of the National ICU Study on every scale except communication timeliness. The researcher did not complete statistical analysis of the differences between the case study scores and the National ICU Study scores. Unlike the previous studies, Miller (2001) probed more deeply into such collaboration variables as type of physician, shift of nurse, and experience of nurse. An examination of these variables identified significant perception differences. In examining these variables the researcher extended the understanding of collaboration. In the discussion section, Miller (2001) expressed surprise that the physicians had rated

every scale higher than nursing had rated it. Miller (2001), in repeating the power theme, identified previously in this research by Coombs (2003) stated:

Physicians rated physicians' communication openness with nurses significantly higher than nurses rated nursing openness with physicians. This finding suggests that physicians had less fear of repercussion or misunderstanding when speaking with nurses than nurses did when speaking with physicians. This finding also implies that physicians held more power on this unit than nurses did. (p. 348)

The subsection studies (Melia, 2001; King & Lee, 1994; Baggs et al., 1999; Coombs, 2003; Thomas et al., 2003; Miller, 2001) consistently established divergent physician and nurse attitudes toward collaboration. Miller augmented the research dimension, divergent collaborative attitudes by profession, through a survey examination of various demographic sub groups, which included comparisons of primary care physicians and specialists and day shift and night shift nurses. To this researcher, opportunity exists to advance this dimension of understanding through additional interpretive research.

Communication Improvements in the ICU

Self-Report of Collaborative Communication, mean scores improved after the intervention on 12 of the 14 scales. The scales measuring leadership, communication, coordination, problem solving, and conflict management (Wilks' Lambda = .71, $F(13, 112) = 3.45, p \leq .001$, multivariate $\eta^2 = .29$) demonstrated increased scores. The Boyle and Kochinda (2004) conducted a pretest-posttest repeated measures design study to evaluate a communication intervention among clinical leaders in two ICUs. The independent variable was the educational intervention of collaborative communication. Data collection post intervention occurred twice with different measures: the dependent variable of the first collection was improved collaborative communication; assessed six

months post intervention, the second set of dependent variables included measures of technical quality of care, perceived ability to meet family needs, work group cohesion, job stress, and commitment to remain in the job. The researchers adapted the definition of collaborative communication set forth by Baggs: “nurses and physicians working together cooperatively—sharing responsibility for problem solving, conflict management, decision making, communication, and coordination” (as cited in Boyle & Kochinda, 2004, p. 61). Boyle and Kochinda (2004) reported that the intervention focused on the dimensions of the nurse-physician collaborative communication: leadership, communication, coordination, problem solving/conflict management, and team-oriented culture. The study objectives included: (a) to assess the feasibility of a collaborative communication-building improvement with ICU nurses and physician leaders; (b) to investigate the improvement effects on collaborative communication skills of ICU nursing and physician leaders; and (c) to assess the initial effects of the collaborative communication intervention on the dependent variables.

Following the collection of preintervention data, Boyle and Kochinda (2004) implemented the Collaborative Communication Intervention over an eight-month period. At the first session of the Collaborative Communication Intervention, the nurse and physician leaders completed the Collaboration Skills Simulation Vignette and the Leader Self-Report of Collaborative Communication. The researchers repeated this same evaluation cycle following the intervention. Immediately following the intervention, the researchers collected data only from physician and nurse leaders involved in the intervention. Six months after the intervention, the researchers repeated the baseline measures.

The objective of the Collaborative Communication Intervention included the improvement by the leadership team of collaborative relationships among all ICU nurses and physicians. Boyle and Kochinda (2004) described the Collaborative Communication Intervention: (a) 23.5 hours of communication skills of training; (b) six modules from a national training company on leadership, communication core skills, conflict resolution, change strategies, teams, and trust; and (c) ongoing role-playing among the clinical leaders, and (d) continuing assessment, feedback, and reinforcement. Boyle and Kochinda (2004) identified two measures used to document the changes among the targeted clinical leaders. The researchers developed a Collaboration Skills Simulation Vignette to evaluate the intervention participants. They established content validity of the simulation with three nurse leaders and one physician leader. Scorers grouped vignette responses to one of the interaction process elements, collaboration skills, and relationship skills. The researchers created a formula to score the proportion of skills the respondent provided in relation to the number possible. For both skill sets the possible scores ranged from zero to one hundred; a higher score meant that more skills were demonstrated. Initial baseline intrarater and interrater reliability estimates were .92 and .82. The researchers stated that

construct validity of the simulation was supported through hypothesized correlations with the leader Self-Report of Collaborative Communication scales. For example, collaboration behaviors correlated $r = .48$ with overall satisfaction with communication. Relationship behaviors correlated $r = .37$ with self-perception of leadership and $r = .40$ with asking for ideas. (p. 64)

For the second measure the researchers modified the established ICU Nurse-Physician Questionnaire by Shortell (as cited in Boyle & Kochinda, 2004). Renamed the Leader Self-Report of Collaborative Communication, the survey, completed by

nurse and physician leaders, measured self-perceptions of unit leadership, communication, coordination, and problem solving/conflict management. The alpha reliability of the scales ranged from .70 to .94. Boyle and Kochinda (2004) also described the evaluation of ICU culture changes. The third measure, completed by staff, was the ICU Nurse-Physician Questionnaire (five scales). The aspects assessed were nurse leadership, physician leadership, openness between groups, problem solving between groups, and satisfaction with communication. The alpha reliability of the selected scales ranged from .70 to .94. The unit staff members also completed a survey that measured their evaluation of ICU patient and organizational outcomes. The outcomes were perceived technical quality of care, perceived ability to meet family needs, work group cohesion, job stress, job satisfaction, and intent to stay in the job. The alphas reliability on these scores ranged from .81 to .91.

Boyle and Kochinda (2005) described the data analysis. To investigate the intervention feasibility, the researchers reported descriptive statistics about the intervention attendance and usefulness. To measure the intervention effects on collaborative communication skills of the ICU nursing and physician leaders, who were intervention participants, the researchers used various statistical methods: (a) paired sample *t* tests to compare preintervention and postintervention means on the Collaborative Communication Simulation Vignette; (b) within-subject analysis of variance analysis of (F ratio and Wilk's Lambda) to determine whether the score patterns changed among the 14 scales of the Leader Self-Report of Collaborative Communication; and (c) repeated measures multivariate analysis of variance (MANOVA). The *F* ratio and Hotellings MANOVA *T* indicated whether any

differences in collaboration were occurring on the units. In the case that changes were found, the researchers used univariate analyses of variance to identify the specific scales producing the differences. The researchers also used a repeated-measures MANOVA to analyze the third objective: to assess the initial effects of the collaborative communication invention on ICU outcomes. The evaluated outcomes were perceived technical quality of care, perceived ability to meet family member needs, work-group unity, job stress, job satisfaction, and commitment to remain in the job. The researchers selected $p \leq .05$ as the significance level of all analyses. The researchers also reported that because the numbers of clinical leaders in the groups was so small, only Group B was included in the staff analyses.

Boyle and Kochinda (2004) measured the intervention feasibility by the ICU clinical leaders' attendance (nurses, $n = 7$) (physicians, $n = 3$) and the perceived intervention usefulness. The mean attendance was 20.5 hours (range = 15.5-23.5) as compared to the total 23.5 hours offered. Sixty percent (two physicians and four nurses) attended more than 91% of the interventions. To measure the perceived intervention usefulness, the participants rated the modules usefulness. Three of the modules communication core skills ($M = 4.9$), trust ($M = 4.8$), and teams ($M = 4.8$) received the highest scores. The participants rated the leadership module, which received a 4-rating, the least useful.

Boyle and Kochinda (2004) reported that postintervention, the scores of the clinical leader communication skills as measured on the Collaborative Communication Simulation Vignette increased from a mean of 56.67 pretest to 75.33 posttest ($t = 2.81$, $p = .02$). The researchers did not report degrees of freedom statistics. Utilizing the

Leader researchers completed follow-up paired sample *t* tests. These *t* tests demonstrated that the intervention participants' exhibited overall satisfaction with leadership skills ($t = 2.36, p = .05$), and overall satisfaction with communication skills ($t = 2.99, p = .017$) increased significantly. To confirm the intervention participant scores, the staff nurses and physicians in Unit B reported significantly increased collaborative communication post intervention (Hotellings MANOVA = 1.31, $p = .013$, $n = 21$). The Unit B staff nurses and physicians identified that perceptions of problem solving between groups and nursing leadership improved significantly.

Six-months postintervention Boyle and Kochinda (2004) surveyed the Unit B staff nurses and physicians on the intervention effect on the ICU outcomes of perceived technical quality of care, perceived ability to meet family needs, work group unity, job stress, and commitment to stay in the job. The researchers reported that Unit B staff nurses perceived significantly increased outcomes following the intervention (Hotellings MANOVA = 6.13, $p = .001$, $n = 15$). The outcome, identified particularly as personal stress, decreased. Simultaneously, situational stress, related to staffing and time constraints, increased significantly. While such measures as technical quality of care, ability to meet family needs, and work group unity increased, the increase was not significant. Following the identification of study limitations of small sample sizes and lack of a control group, Boyle and Kochinda (2004) stated that this study affirmed that an intervention could improve collaborative communication skills. For this researcher, the topic of collaborative communication, its communication skills education, and the comprehensive communication instrument, The ICU Physician-Nurse Questionnaire are highly relevant to the research questions posed in this research.

Dodek and Raboud (2003) conducted a pre- and post-repeated measures design. They evaluated an intervention of standardized rounds with explicit reporting and responsibilities in a 15-bed medical-surgical ICU, located in a Canadian tertiary teaching hospital. The researchers hypothesized that the independent variable of ICU standardized bedside rounds that defined clinical and educational responsibilities, reporting assessments, and plans would improve the dependent variables of communication and satisfaction among health care providers.

The intervention, developed by a multidisciplinary round improvement team, included design and implementation of the explicit ICU rounds process. The rounds included the following characteristics and expectations: (a) shorter in duration and earlier “hand-over” (Dodek & Raboud, 2003, p. 1585) rounds in the mornings; (b) medication reorders, transfer notes and orders, and communication with consultants were to be completed prior to attending rounds; (c) bedside presentation during the rounds summarized the significant events in the last 24 hours, a system assessment by the nurse and respiratory therapist, and a problem-oriented summary of pertinent issues and plans by the designated resident; (d) designation of a “consult resident” (Dodek & Raboud, 2003, p. 1585) who was responsible for accepting all residents’ telephone calls that occurred during attending rounds; and (e) education points presented by the attending physician.

To collect data prior to and post rounding change, Dodeck and Raboud (2003) developed two surveys to be completed anonymously following rounds. The first survey was completed by the head nurse who recorded the following information for each patient: (a) the time spent to conduct the round with each patient; (b) indication of

whether there was repetition of content; (c-f) whether each of the presentations by the nurse, respiratory therapist, resident, and attending physician were professional and respectful; and (g) whether there was formal, organized teaching. The second survey, comprised of 13 yes/no response questions, was completed by each participant at the round for each patient and measured the standardized round process, including the following questions: (a) “Was the patient examined prior to rounds?” (p. 1585); (b) “Is there a medical problem list?” (p. 1585); (c) “Is there a long-term plan (beyond next 24 h) for this patient?” (p. 1585); (d) “Was there structured teaching around this patient?” (p. 1585); (e) “Were the discussions (other than structured teaching) a useful experience?” (p. 1585); and (f) “For this patient, were you satisfied with the process and outcome of rounds?” (p. 1585).

Dodek and Raboud (2003) explained that the improvement team evaluated the surveys for face and content validity. No other measures establishing validity, reliability, or sensitivity to change were gathered. The surveys were completed during attending rounds on 12 days, 2 months pre-intervention implementation and again for a period of 19 days, 16 months post-intervention implementation. Assistant head nurses submitted surveys, which evaluated 136 rounds pre-intervention and 209 rounds post-intervention. Dodek and Raboud (2003) analyzed the data by survey period and profession. The researchers evaluated the average round duration time with a simple *t* test and compared responses between the two data collections for each profession by a two sample test of proportions with a correction for continuity or Fisher’s exact test when proportions were close to 1 or 0. Generalized estimating equation (GEE) logistic regression models were fit to examine the impact of the survey period on binary

responses while controlling for correlated responses from individuals attending the same round. A separate GEE logistic regression model was fit for each binary response, where the only covariate in each model was a binary covariate for pre-intervention vs. post-intervention. (p. 1586)

Dodek and Raboud (2003) reported the study findings. The mean duration time of the rounds was not statistically different between the pre-intervention and post-intervention rounds (10.3 vs. 10.6 minutes, $p = 0.54$). Two questions on the first survey demonstrated significant differences between the pre-intervention and post-intervention data collections: (a) The assistant head nurses reported that the attending physician was more likely to be present (85% pre-implementation compared to 93% post-implementation), ($p = 0.02$); and (b) that there was more organized formal teaching (24% pre-implementation compared to 43%), ($p = 0.001$). The researchers reported that health care providers completed 2,654 of the second surveys: 1,088 pre-implementation surveys and 1,566 post-implementation surveys. All surveys were also examined by professional grouping: residents ($n = 719$), nurses ($n = 419$), pharmacists ($n = 328$), medical students ($n = 319$), respiratory therapists ($n = 270$), fellows ($n = 259$), and attending physicians ($n = 125$). They explained that 217 surveys were returned with no profession declared, and 115 surveys were submitted with room and bed identifying information missing; these 332 surveys were deleted from the GEE analysis. Dodek and Raboud (2003) reported significant increases in the percentage of respondents responding *yes* on the following questions: (a) "Is there a long term plan?" (pre = 53%, post = 73.8%, $p = 0.0001$); (b) "Is the long term plan clear?" (pre = 54%, post = 76.3%, $p = 0.0001$); (c) "Was there structured teaching around this patient?" (pre = 29.7%, post

= 46.1%, $p = 0.0001$) (p. 1585)”; (d) “Were the discussions (other than structured teaching) a useful experience?” (pre = 64.5%, post = 78.9%, $p = 0.0001$) (p. 1585)”; and (e) “For this patient, were you satisfied with the process and outcome of rounds?” (pre = 86.3%, post = 95%, $p = 0.0001$) (p. 1585). The researchers also reported a significant decrease in the percentages which responded *yes* to two questions: (a) “Was the patient examined prior to rounds?” (pre = 87.9%, post = 76.1%, $p = 0.003$) (p. 1585); and (b) “Is there a problem list?” (pre = 98.5%, post = 95.9%, $p = 0.001$) (p. 1585). The researchers commented on these decreases: “However, the magnitude of this difference was relatively small and the absolute values of these proportions (both before and after) were relatively high” (p. 1586). They asserted that the implementation of this explicit process had resulted in increased satisfaction and improved communication; the study findings had affirmed the researchers’ hypothesis.

Jain, Miller, Belt, King, and Berwick (2006) conducted a pre- and post-repeated measures quasi experimental study of the effects of four independent variables on the dependent variable of nosocomial infection rates. The independent variables included physician-led multidisciplinary rounds, daily meetings for bed availability, implementation of evidenced based *bundles*, and encouragement of a team-based decision process. Institute of Healthcare Improvement defined bundles as “sets of evidence based best practice designed to optimize treatment and prevent complications” (as cited in Jain et al., 2006, p. 237). Nosocomial infections, not uncommon in ICUs, are acquired within the hospital settings often through such treatment devices as catheters, ventilators, and an implanted intravenous central line for antibiotics. The

researchers conducted the study in a 28-bed ICU at Baptist DeSoto Hospital, Southaven, Mississippi from October 2000 to September 2003.

The first intervention, multidisciplinary rounds, was possible when the hospital administration hired an 'intensivist' physician, a physician usually based in the ICU to care for critical patients (*MedicineNet.com*, 2007b), for eight hours daily. The intensivist led the multidisciplinary rounds, attended by the patient's nurse, pharmacist, respiratory therapist, case manager, social worker, ICU charge nurse, physical therapist, palliative care nurse, and dietician. Prior to the rounds inception, the ancillary staff was available for consultation, but "did not seek out opportunities to intervene" (Jain, 2006, p. 236). During their rounds, the team set daily goals for the patients and structured their discussion with "trigger tools" (p. 236). A trigger tool was a list of 29 conditions which defined ICU adverse events; examples of these triggers included: restraint use, oversedation, infection of any kind, patient fall, decubiti or bedsores, pneumonia onset, in-hospital stroke, and a readmission to the ICU within 30 days.

The second intervention was a redesign of the patient transfer and bed assignment system. Prior to October 2002, the house manager alone was accountable for this function; afterwards a multidisciplinary team of case management, social services, and environmental services, nursing representatives was responsible. The team met for 20 minutes twice daily to assess facility bed needs and resources, prioritize actions, review historical trend data, and set goals. The third intervention was the adoption of best practice bundles and accompanying checklists for ventilator acquired pneumonia, central line treatment, and urinary track infection treatment. For example, the ventilator associated pneumonia bundle included the following practices: (a)

“elevation of the head of the bed to 30 degrees”; (b) “prophylaxis for peptic ulcer disease”; (c) “prophylaxis for venous thrombosis”; (d) “care of mouth every two hours”; (e) “stop sedation every 24 hours”; and (f) “conduct evaluations for readiness to wean patient from the ventilator” (p. 237). When completing the rounds, the multidisciplinary team employed a bundles checklist. The fourth intervention, culture change, described as the physician encouragement of team members to give input into the decision-making process, was not measured.

Jain et al. (2006) collected data in three periods: (a) prior to the intervention implementation in FY 2001; (b) during the intervention implementation in FY 2002; and (c) after the intervention implementation in FY 2003. To determine the interventions effects, Jain et al. (2007) measured adverse events-per-ICU-day, the ventilator associated pneumonia rate, the blood stream infection rate, the nosocomial urinary tract infection rate, mortality length of stay and cost per patient day data prior to interventions in 2001-2002 and postinterventions in 2003. The researchers used Center for Disease Control definitions for the clinical indicators of rates for ventilator associated pneumonia and the nosocomial urinary tract infections. The researchers defined mortality as the number of ICU deaths per ICU discharges per month. They based the “rolling 12 month average length of stay per episode” on the average length of each episode of ICU care (p. 236). The cost-per-patient-day was the total cost of caring for an ICU patient for a 24-hour period. The cost-per-ICU episode was defined as the cost-per-patient day multiplied by the average length of ICU stay.

Jain et al. (2006) abstracted the utilization and cost data from patient clinical charts and the information deposition system. A registered nurse, specialized in

infection diseases, abstracted the data for the nosocomial infections related to pneumonia, blood, and urinary tracts. Another RN selected a monthly random sample of at least 20 charts, which represented a 20% sample to assess the number of adverse events, which were identified by the trigger list. (The researchers did not identify sample size or the total number of patients included in the length of stay, financial, or nosocomial indicators.) They used χ^2 to compare the number of infections prior to the interventions with the number of infections during the remeasurement time periods. To clarify their measurement, Jain et al. (2006) cited the example of total number of ventilator pneumonia cases per ventilator day:

. . . for the combined baseline plus re-measurement time periods was taken as the expected rate under the null hypothesis that the infection rate was independent of the time period. Under this null hypothesis the expected infections during each specific time period were then determined from this total rate of VAPs per ventilator day and the specific number of ventilator days in each period. The χ^2 statistic is the sum across time periods of squared differences between the observed and expected infections per expected infections. (p. 236)

Jain et al. (2006) reported that the clinical indicators showed significant improvement: (a) The ventilator rates of VAP per 1000 ventilator days decreased preintervention rates of 7.5 to postintervention rates of 3.2 ($p = 0.04$); (b) blood infection rates declined from 5.9 in 2001 to 3.1 in 2003 ($p = 0.03$); and (c) urinary tract infections rates declined from 3.8 to 2.4 in 2003 ($p = 0.17$). They reported that the number of adverse events in the ICU also decreased. Even though a run chart demonstrated the decrease following the implementation of multidisciplinary rounds, the researchers reported that insufficient data collection prior to the interventions was a barrier to statistical analysis. Mortality rates did not decline.

Reduction was also demonstrated in length of stay and cost indicators: (a) The rolling average of length of stay per episode in the ICU declined steadily from 5.92 in FY 2001 to 5.25 in FY 2002 to 5.12 FY 2003 to 4.71 2004 Year to Date; and (b) the average cost-per-ICU episode reflected the reduced length of stay and demonstrated a 21% reduction from FY 2002 to FY 2004 Year to Date: (a) FY 2002, \$3,406; (b) FY 2003, \$2,973; and (c) FY 2004 YTD, \$2,704. This study shows that structured multidisciplinary rounds, daily meetings for bed availability, implementation of evidenced-based *bundles*, and encouragement of a team-based decision process resulted in significantly decreased rates of nosocomial infections, reduced length of stay in the ICU, and reduced costs. Three of the four interventions improved multidisciplinary teamwork, which resulted in improved efficacy and safer outcomes at lower costs. These interventions demonstrated improvement in three of the six goals, set by the IOM for a future for healthcare system: “Health care should be safe, effective, patient-centered, timely, efficient, and equitable” (Committee on Quality Health Care in America, 2001, p. 6).

All subsection studies (Dodek & Raboud, 2003; Jain et al., 2006; Boyle & Kochinda, 2004) demonstrated that interventions which improved communication also increased the frequency and improved the quality of collaboration. In the case of the final study, Jain et al. (2006) confirmed that process interventions promoting collaboration resulted in improved outcomes.

Summary of Organizational Culture and Performance of the ICU

Studies of ICU processes, culture, and outcomes continue to link collaboration with performance: ICU collaboration was associated with increased coordination and

patient satisfaction, and reduced length of stay outcomes (Shortell et al., 1994); improved clinical outcomes (Baggs & Ryan, 1990; Knaus et al., 1986; Wheelan et al., 2003); higher staff satisfaction (Baggs & Ryan, 1990); increased safety (Jain et al., 2006) and significant cost decreases when improvements emphasizing collaboration were implemented (Clemmer et al., 1999). In the ICU the outcomes linked with collaboration are synonymous with those identified as requisite in a future reformed system.

Both physician and nurse critical care societies, The Society of Critical Care Medicine and American Association of Critical Care Nurses, endorsed collaboration and shared responsibility for ICU leadership as elemental to optimizing medical care (Barden, 2005; Brill et al., 2001). While both critical care organizations endorsed collaboration in concept, the nursing organization was more assertive in its promotion of shared decision-making. This variance in professional position reoccurs when researchers examine the perception differences that individual physicians and nurses have regarding collaboration: ICU nurses regarded collaboration as being more important and less frequent than their medical counterparts (King & Baggs et al., 1999; Coombs, 2003; Thomas et al., 2003). In research related to physician and nurse perceptions of collaboration, Miller (2001) and Coombs (2003) introduced the variable of physician power and its use in the decision-making process, and Miller (2001) raised nurses' fears of negative consequences when raising issues with physicians.

ICUs can increase collaboration through various interventions (Boyle & Kochinda, 2004). Recent implementations of standardized processes, such as multidisciplinary rounds, improved collaboration and communication (Dodek &

Raboud, 2003) and resulted in significantly decreased adverse events, reduced ICU length of stay, and reduced costs (Jain et al., 2006).

In the next and final section, Crew Resource Management and SBAR, the review explores and explicates additional standardized communication processes, including SBAR.

Crew Resource Management and SBAR

As previously stated, the IOM in its report *To Err is Human* (2000) advised health care organizations to improve patient safety by developing better communication and teamwork (as cited in Thompson, Holzmueller, Hunt, Cafeo, Sexton, & Pronovost, 2005). In its second series report, *Crossing the Quality Chasm*, the IOM counseled: “Clinicians and institutions should actively collaborate and communicate to ensure an appropriate exchange of information and coordination of care” (as cited in Kosnick, 2002, p. 235). In its reports, the IOM challenged health care to study methodologies used in high reliability industries, including aviation (as cited in Powell & Hill, 2006). High reliability is defined as “the probability of a product performing without failure a specified function under given conditions for a specified period of time” (Berwick, 2003). The IOM in its third report *Keeping Patients Safe; Transforming the Work Environment of Nurses* (Committee on the Work Environment for Nurses and Patient Safety, 2004) asserted that “considerable interest has been expressed in the beneficial effect of a process defined as crew resource management (CRM)” (p. 365). This section considers processes, very recently adapted from the aviation and military methodologies that while designed to decrease safety failures, also increase teamwork and foster collaboration.

For more than twenty years, the aviation industry improved its safety outcomes and became a high reliability industry (Powell & Hill, 2006). Following the 1977 aviation accident when two Boeing 747s collided in the Canary Islands and killed 583 persons, the National Aeronautics and Space Administration (NASA) leaders appointed an investigative panel (Murphy, 2006); that panel developed Crew Resource Management (CRM). CRM “considers human performance limiters (such as fatigue and stress) and the nature of human error, and it defines behaviors that are countermeasures to error, such as leadership, briefings, monitoring and cross checking, decision making, and review and modification of plans” (as cited in McCarthy & Blumenthal, 2006, p. 172). The Federal Aviation Administration mandated that all commercial and military pilots complete CRM training to (a) recognize human limitations and dangers of fatigue; (b) comprehend and successfully communicate issues; (c) support and listen to team members, (d) manage conflicts; (e) develop plans for possible problems; and (f) make decisions with all available resources (Murphy, 2006, p. 3).

R.L. Helmrich, Director of the University of Texas Human Factors Research Project, described the congruency of organizational culture and human behavior in aviation and health care: In both aviation and medicine, functioning as a team is imperative; error is identified in aviation as “any action or inaction leading to deviation from team or organizational intentions” (McCarthy, 2006, p. 783). Other observational research identified categories of aviation safety issues that corresponded to those in health care: these safety issues categories included poor decision making and incomplete, misinterpreted, or incorrect communication (Sherwood et al., 2002).

CRM supports collaboration with structured communication processes, technologies, and process improvements. According to Shappell and Wiegmann, the elements of CRM include “back up systems, team communication and coordination, adequate briefings, availability and use of resources, leadership and adequate supervision, system knowledge, personal readiness, planning, correction of known problems, and issues and management support” (as cited in Kosnick, 2002 , p. 236). Hospital leadership teams have either recently adapted or replicated CRM processes of briefings, checklists, and standardized reporting.

Morning Briefings

The Johns Hopkins Medical Institutions of Baltimore, Maryland implemented a variety of structured briefings, adapted from CRM. Makary, Holzmueller, Thompson, Rowen, Heitmiller, Maley, et al. (2006, p. 351) described the Operating Room (OR) Briefing, which afforded caregivers a structured method “to promote effective interdisciplinary communication and teamwork in the OR.” Occurring three minutes prior to the surgery beginning, the OR Briefing is conducted in three phases to check critical information and promote and support open communication during the operation: (a) introduction of team members; (b) review of critical clinical information; and (c) review by each surgical caregiver of any information related to his specific responsibilities or any safety concerns. Makary et al. (2006, p. 236) submitted that the briefing was currently being applied to several settings to reduce risk. Specifically, the researchers noted that the briefing could occur in the ICU prior to the insertion of a central line for infusion of antibiotics. The authors did not report data on the briefing.

Thompson, Holzmueller, Hunt, Cafeo, Sexton, and Pronovost (2005) described Johns Hopkins ICU implementation of a “morning briefing” process, organized by a briefing outline tool “to promote effective communication and optimize shared information” (p. 476). The leaders developed the tool to meet the following criteria: (a) simple to be used; (b) organized the information exchange into a minimum of time; and (c) advanced interdisciplinary teamwork.

Thompson et al. (2005) designed the five- to ten-minute morning briefing to assemble the attending physician, night-shift charge nurse, and the forthcoming day-shift nurse. The researchers noted, “In our physician coverage model, the ICU attending is an intensivist, but any physician who directs ICU rounds, such as a hospitalist, surgeon, or primary care physician, could use the briefing form effectively” (p. 476). The briefing occurred at approximately 7:30 each morning prior to physician visits to ICU patients. This timeframe coincided with caregiver changes of shift, a particular vulnerable period for missed or forgotten information. These information errors could be variables contributing to deaths or injuries.

Thompson et al. (2006) explained that the briefing was organized to answer three questions: (a) “What happened overnight that I need to be aware of?” to identify adverse events, admissions and discharges (p. 476); (b) “Where should I begin rounds?” to prioritize patients “to provide immediate intervention” and set goals for the sickest patients and to plan transfer for patients to a less acute unit (p.476); and (c) “What are your concerns regarding potential problems for today?” to identify any issues with patient scheduling, equipment access, or staffing (p. 477).

Thompson et al. (2006), who concluded that the morning briefing was successful and developed other tools to be piloted in Johns Hopkins ICUs, stated:

Briefings enable leaders to plan for contingencies, establish norms, discuss threats, and build the team—all that the same time. Anecdotally, the charge nurses and front-line nursing staff report improved interdisciplinary communication that has enhanced teamwork, identified defects, improved the admission/discharge process, and improved situational awareness among the ICU clinical staff. (p. 477)

Daily Goal Sheets

Provonost, Berenholtz, Dorman, Lipset, Simmonds, and Haranden (2003) also of Johns Hopkins ICU conducted a pre- and post-repeated measures study of the independent variable of a daily goal sheet, designed to improve communication concerning ICU patients. The dependent variables were communication of the ICU staff and length of stay data. Provonost et al. (2003) posited that this strategy for improved communication among the health care team members was “based on the principles of CRM” (p. 7). The ICU care team, comprised of physicians, nurses, pharmacists, and respiratory therapists, developed the one-page daily goal sheet, which standardized the assessment of goals and communication. In completing the sheet during patient rounds, the physician listed the tasks, which were to be completed, described the care plan, and identified pertinent communication; following rounds on that patient, the physician gave the sheet to the patient’s nurse, who shared the sheet with all multidisciplinary care providers throughout the shift.

Prior to developing the goals sheet, Provonost et al. (2003) conducted a two-question survey measuring the ICU nurses’ and residents’ understanding of patient treatment goals: (a) “How well do you understand the goals for this patient today?” and (b) “How well do you understand what work needs to be accomplished to get this

patient to the next level of care?” (p. 72). The respondents selected from a 5-point Likert-type scale: 1 (*understand nothing*), 2 (*understand little*), 3 (*understand somewhat*), 4 (*mostly understand*), and 5 (*completely understand*). For eight weeks Provonost et al., (2003) daily randomly surveyed the resident and nurse caring for two patients. The researchers also conducted semi-structured interviews with 15 providers, who had used the form. They asked the following questions: (a) “What was the affect of the goals form on communication?”; (b) “What was the affect of the goal form on patient outcomes?”; (c) “How long on average did the form take to complete?”; and (d) “Did the form negatively affect patient care?”(p. 73). The researchers also studied the goal sheet impact on the ICU patients’ average length of stay. The researchers developed and piloted the daily goals sheet during May and June 2001, implemented the form in July 2001, and evaluated its effect on ICU length of stay (LOS) for a full year beginning in July 2001.

Provonost et al. (2003) explained that “the analysis is descriptive” (p. 73). The researchers did not report statistical tests. They analyzed LOS data and the percentages of respondents who selected (4) or (5) signifying understanding of daily therapy with separate run charts. Prior to implementation of the daily goal sheet, less than ten percent of the residents and nurses selected (4) or (5) signifying that they understood the daily goals of therapy. Following the intervention of the daily goal sheet, the percentage of residents and nurses who stated that they understood the goals was 95%. The researchers reported that following the goal sheet implementation, “the ICU length of stay decreased significantly from a mean of 2.2 days to 1.1 days” (p. 73). Because patients stayed in the ICU a shorter duration, the ICU could accommodate additional

patients. Provonost et al. (2003) stated, “Annualized, the ICU was able to admit 670 additional patients” (p. 73).

Provonost et al. (2003) noted that the study design did not investigate the reasons why the length of stay decreased 50%. An adaptation of this form was used in 50 hospital ICUs involved in an improvement initiative with Institute of Healthcare Improvement (IHI) and Volunteer Hospitals of America (VHA). The researchers concluded: “These improvements were likely owing to clarifying tasks, care plans, and communication plans among caregivers Simple strategies such as this, based on principles of CRM, may provide a practical means to introduce CRM into healthcare” (p. 75). This structured process, which promoted provider coordination of care similar to that described by Shortell et al. (1994), delivered the synonymous outcome of reduced length of stay, in addition to more positively perceived communication.

Narasimhan, Eisen, Mahoney, Acerra, and Rosen (2006) conducted a pre- and post-repeated measures study to assess the LOS and satisfaction effects of a standardized daily goals work sheet used in a 16-bed medical intensive care unit. Narasimhan et al. (2006) affirmed that their organization, Beth Israel Hospital, a 697-bed teaching hospital in New York, also had participated in the IHI and VHA improvement initiative described previously. The simple worksheet, similar but not identical to that described by Provonost et al. (2003), included tests or procedures, family discussions, consents, and disposition. ICU nurses and physicians began using the worksheet on January 1, 2004.

The researchers surveyed all attending physicians, residents, interns, and nurses who were assigned to the ICU from January through March 2004. They assessed

baseline satisfaction with communication prior to the worksheet implementation. After the worksheet was implemented, the researchers reexamined the satisfaction with communication. They also administered another questionnaire, which measured the worksheet usefulness. No questionnaire validity or reliability information was reported. Both questionnaires were administered one week, six weeks, and nine months post-implementation. The satisfaction survey given prior to implementation included the questions:

- (a) “How well do you understand the goals of care for these patients?”;
- (b) “How well do you understand the tasks that need to be completed today?”;
- (c) “Do you understand what needs to be done to move this patient to the next level of care?”; (d) “How would you rate the communication between you and the physicians (nurses) taking care of your patients?”; and (e) “Would you like to use a patient care goals sheet for your patient to improve communication between the physicians (nurses) and yourself?” (p. 220).

The survey questionnaire, implemented post-intervention, included the questions:

- (a) “How well do you understand the goals of care for these patients?”; (b) “What was the effect of the goals sheet on communication?”; (c) “What was the effect of the goal form on patients’ outcomes?”; (d) “How long on average did the form take to complete?”; (e) “Did the form negatively affect patient care?”; and (f) “Would you like to continue to use this patient care goals sheet for your patients to improve communication between the physicians (nurses) and yourself?” (p. 220).

Responses were scored on a five-point scale: 1 (*understand nothing*) to 5 (*completely understand*). Narasimhan et al. (2006) also analyzed the length of stay the first nine months following the implementation and compared the post-implementation length of stay with the same nine-month period in the calendar year prior to implementation. The researchers (2006) analyzed the continuous variables by using a *t*

test. They used a chi square test to identify categorical differences for the pre- and post-implementation surveys. The researchers identified the significance level ($p \leq .05$).

Narasimhan et al.(2006) reported the average worksheet completion time was one minute. The survey, completed six weeks post-implementation, demonstrated that the most significant improvements were in relationship to understanding the day goals: nurses' scores improved ($p = .001$) from 3.9 (SD 1.02) to 4.8 (SD 0.39) and physicians' scores improved ($p = .03$) from 4.6 (SD 0.67) to 4.9 (SD 0.32). The scores were sustained nine months later in both the nurses and the physician groups: 4.4 (SD 0.51) for nurses and 4.6 (SD 0.61) for physicians. Narasimhan et al. (2006) also described the pre- to post-implementation communication improvement results that nurses and physicians perceived with each other. Nurses' scores were higher ($p = .03$) from 3.6 (SD 0.87) to 4.3 (SD 0.87) and physicians' scores were also higher: ($p = .01$) from 3.4 (SD 0.90) to 4.7 (SD 0.48). Following the nine months post-implementation, the communication scores were sustained at a high level. The researchers reported a significant attitude change toward the worksheet. Post-implementation, the nurses were more positive about continuing its use (71% before to 93% after, $p = .02$). Physicians, in contrast, decreased in their desire to use the worksheet (100% before to 64% afterwards). During the study, the average LOS in the unit was 4.3 days, down from 6.4 days for the corresponding nine-month period in the prior year ($p = .02$).

SBAR

In a time/activity study in one ICU, Donchin, Gopher, Okin, et al. (1995) established that only 2% of care provider activity involved communication between nurses and physicians. When the researchers analyzed the error reports of that unit, they found that nurse-physician communication caused 37% of all errors in the unit (as

cited in Sherwood et al., 2002, p. 337). In addition to such structured communication processes as briefings and debriefings, a need exists for more standardized formats for physicians and nurses to communicate decisions and information in complex environments, which sometimes become crises environments (Leonard, Graham, & Bonacum, 2004). In health care, these areas are the ICU, operating room, and the emergency room. Dr. Stephen B. Smith, chief medical officer at the Nebraska Medical Center in Omaha, the University of Nebraska academic hospital, addressed the need for adapted CRM structured communication in high risk, complex environments: We're where the airline industry was 30 years ago. . . . We need to change the culture so communication is more organized, regimented and collaborative, like what you find now in the cockpit of an airplane. (Murphy, 2006, p. 3)

The Joint Commission, the credentialing agency for health care organizations, concurred with Dr. Smith about the need for change in communication between health care providers: In January 2006, The Joint Commission stipulated that credentialed organizations implement a standardized method during hand-off communications between providers. To meet the standard, the method was required to contain a phase providing providers the opportunity to ask questions and respond to them (Haig, Sutton, & Whittington, 2006).

The Kaiser-Permanente Healthcare system, a nonprofit American health care system which provides care for 8.3 million patients, implemented such a standardized, collaborative communication system as a portion of its CRM training (Leonard et al., 2004). Other sources credited the development of SBAR to the military, specifically for submarine communication ("Tips for introducing SBAR in the OR," 2006). The

researchers stated, “Our experience has reinforced the belief that simple rules are best for managing complex environments. The tools and concepts that have proven the most valuable are collectively known as SBAR (situation, background, assessment, and recommendation)” (Leonard et al., 2004, p. i85).

SBAR is an effective tool that provides a common and predictable structure to the communication. It can be used in any clinical domain and has been widely applied in obstetrics, OR, ICU, and other areas (Guise & Lowe, 2006). For a clinical example and in this research, a nurse might use the template to communicate a change in patient status to a physician. Leonard et al. (2004) noted that SBAR adds value for its users by serving as a critical thinking and organizing template. Leonard et al. (2004) continued “Effective communication and teamwork is aimed at creating a common mental model, or ‘getting everyone in the same movie’” (p. i86) SBAR is a positive addition to a safety culture where all team members feel safe and will be assertive if they perceive a danger or opportunity for failure.

The researchers (Leonard et al., 2004) explained that in the S phase, the care provider explains the *situation* or the reason for the contact. In the B phase, the care provider describes the clinical context or *background*. In the A phase, the care provider gives her *assessment* of the problem and in the R phase, the care provider *recommends* what she thinks should occur to correct it. Leonard, et al. (2004) clarified the use of SBAR by applying it to a call from a nurse to physician:

Situation: “Dr. Preston, I’m calling about Mr. Lakewood, who’s having trouble breathing.”

Background: “He’s a 54 year old man with chronic lung disease who have been sliding downhill, and now he’s acutely worse.”

Assessment: “I don’t hear any breath sounds in his right chest. I think he has a pneumothorax.”

Recommendations: “I need you to see him right now. I think he needs a chest tube.” (p. 981)

Because SBAR implementation is novel in health care, very few empirical studies related to its efficacy exist. Haig, Sutton, and Whittington (2006) reported the exception, a case study of SBAR implementation at OSF St. Joseph Medical Center, Bloomington, Illinois. In 2003, hospital leaders recognized that the communication problems between nurses and physicians existed. To remedy this problem and to promote a culture of safety, OSF St. Joseph Medical Center selected SBAR as a model, which would foster sharing information, asking questions and making recommendations. Haig et al. (2006) related that the SBAR was implemented in three phases: (a) the pre-implementation phase from April 2004 to August 2004; (b) the implementation phase from September 2004 to November 2005; and (c) the post-implementation phase after November 2005.

In the pre-implementation phase, leaders were selected to plan and lead the implementation effort. Both the Chief Nursing Officer, whose pay was based partly on a successful implementation, and the Medical Director were named as executive sponsors of the team. The Patient Safety Officer was charged with the day-to-day implementation. To ensure that implementation remained an organizational priority, leadership identified the implementation as a key project in the (FY) 2005 system strategic plan. Leaders introduced the SBAR concept to clinicians. During this phase, the leaders completed a monthly random survey in which the patient safety officer called ten staff members, asked them to describe the steps of SBAR, and illustrate how it might be used in daily communications. Each month the sample average was 60% correct.

Haig et al. (2006) explained that the implementation phase began with the appointment of the Spread Team in September 2004. The interdisciplinary Spread Team, comprised of representatives from nursing, pharmacy, rehab, medical imaging, education staff, and media relations, met twice a month for a year. Leaders chartered the team to: (a) improve communication between clinical providers; (b) spread the use of SBAR; and (c) improve the efficiency, timeliness, and efficacy of medical center team interventions. The team began its work by developing and delivering an “elevator speech,” a three-to-four-sentence speech to explain SBAR (Haig et al., 2006, p. 169). Following the methodology of Institute of Healthcare Improvement (IHI), which advised creation of a social system to spread the innovation, the team selected peers who were early innovation adopters (as cited in Haig et al., 2006). In September 2004, the team declared that its goal was to increase the average response on its monthly survey to 90%. Beginning in November 2004, the team intensified and focused its training on the SBAR tool and concept in the following areas: ICU, respiratory, cardiac rehabilitation, cardiac catheterization lab, interventional radiology, medical, surgical, float/registry, pediatrics, transitional care unit, and supervision. In October 2004, the team extended its work beyond education and began the actual implementation and use of SBAR on a medical unit. The team, based on the IHI small test cycle change methodology, implemented SBAR in cycles of plan, do, check, and act and refined the product or process with each cycle. Haig et al. (2006) did not describe any subsequent SBAR changes, resulting from the cycles. Following implementation on the medical unit, the team spread the SBAR trigger tool to the surgical unit in January 2005, to the critical care unit in March 2006, and housewide in April 2005.

The researchers reported that the innovations included using SBAR in a variety of communication including (a) shift report hand-off tools designed especially to labor, postpartum, and nursery, and (b) strategic reporting of a nurse informing a physician of a patient change. The team also developed communication mechanisms, which promoted SBAR use: (a) laminated poster and phone stickers in each unit; (b) middle manager storytelling of SBAR use; (c) peer observation of SBAR use; (d) role playing and feedback of SBAR with physicians; (e) involvement of medical director and physicians in training and encouraging staff to make recommendations to physicians; (f) SBAR screen savers development; and (g) development of a hotline for report of safety concerns using SBAR.

In the post-implementation phase, SBAR for documentation and communication was no longer exclusively used by the clinical areas but had spread into all areas of the hospital. To evaluate the implementation success, the team again measured the percentage of staff that could explain the phases of SBAR and illustrate its use. Desiring to identify outcomes that SBAR might have impacted, the team selected two: (a) consistent use of the medication reconciliation process, and (b) number of all types of adverse patient events. Medication reconciliation, which required much interdisciplinary communication, ensured that various providers have not duplicated, omitted, or missed doses, which could harm the patient. Joint Commission, the credentialing agency for health care organizations, required medication reconciliation data collection and reporting. To measure adverse events, the team selected the Global Trigger Tool, credited to Rezich, Harden, Resar, Classen, Haraden, and Institute of Healthcare Improvement (IHI) (as cited in Haig et al., 2006). The tool is comprised of a

list of action prompts for general medical care, surgical care, intensive care, emergency department, medication, laboratory, and perinatal care that induced investigation for an adverse event, which might have caused patient harm. The researchers randomly selected 20 charts per month and calculated the rate of events per 1,000 patient days.

Haig et al. (2006) reported the following results: (a) process measure of SBAR knowledge and use: a mean of 96% in FY 2005; (b) outcome measure of medication reconciliation: “from October 2002-August 2004 to September 2004-December 2005-admission reconciliation improved from a mean of 72% to a mean of 88% . . . and discharge reconciliation improved from a mean of 53% to a mean of 89%” (Haig et al., 2006, p. 171); and (c) outcome measure of adverse events: The adverse event rate was reduced from a baseline of 89.9 per 1,000 patient days in October 2004 to 39.96 per 1,000 patient days in FY 2005. The researchers did not report statistical analyses.

Referencing the aims presented in the IOM report *Crossing the Quality Chasm* (2001) the researcher concluded, “SBAR promotes the six aims of the Institute of Medicine in providing safe, efficient, effective, equitable, timely, and patient-centered lines of communication” (as cited in Haig et al., 2006, p. 175). SBAR, similar to multidisciplinary rounds (Dodek & Raboud, 2003; Jain et al., 2006) appears to have affected safety outcomes and was implemented successfully.

The SBAR communication protocol, similar to the CRM methods of briefings and daily goal sheets, would add structure to communication of nurse to physician patient status reports. Given nursing views that their input to patient care decisions is important to themselves and their patients (Baggs et al., 1999; Barden, 2005; Seago, 1996; Ulrich et al., 2005), but that physicians do not seek their opinions (Coombs, 2003;

Thomas et al, 2003), one might assume that the SBAR protocol and its successful implementation with nurse reports to physicians is an important and positive initiative to nurses.

Summary

The Institute of Medicine and other entities established the future imperative for American healthcare reform (Committee on Quality Healthcare in America, 2000 and 2001; Committee on the Work Environment for Nurses and Patient Safety, 2004; Schoen et al. 2005): The healthcare system must deliver higher outcomes in safety, quality, and patient and nursing satisfaction, while simultaneously controlling costs (Building a Better Health Care System; Specifications for Reform, 2004). To deliver these challenging, seemingly paradoxical outcomes, health care leaders are charged to change and improve systems, processes, and cultures.

The cultural assessment of organizations by leaders who sought change and improvement established important relationships: (a) Organizational cultures and the respective subcultures were often barriers to the very changes and improvement that the leaders sought (Cohen et al., 2004; Jones et al., 1997; Lanagan-Fox & Tan, 1997; Rizzo et al., 1994; Silvester et al., 1999; Smith et al., 2000), and (b) the culture of an organization was related to its performance (Rousseau, 1990). In their culture assessments, leaders should examine teamwork and collaboration that is demonstrated in subcultures as well as the organizational culture.

Healthcare cultures which emphasize teamwork or collaboration were positively related to process measures and performance outcomes: (a) measures of teamwork were associated positively with nursing Quality of Work Life measures of

commitment, job involvement, empowerment, and job satisfaction and were negatively related to the intent to leave employment (Gifford et al., 2002; Ingersoll et al. 2002); (b) inpatients in 125 Veterans Administration hospitals reported significantly greater satisfaction in hospitals evaluated as having a teamwork culture (Meterko et al., 2004); (c) cultures of teamwork were positively associated with organization wide acceptance and integration of the new methodology of Quality Improvement (Parker et al., 1999); and (d) organizations with Constructive cultures were related positively with organizational readiness, the organization ability to change and adapt (Ingersoll et al., 2002). Seago (1996) demonstrated that the greater the work group decision latitude or involvement in decision-making, the lower the absenteeism. Freedman and Berger (2004) found that by improving communication processes collaboration could be developed among the interdisciplinary surgery staff; and in the process of increasing collaboration, the length of stay was significantly decreased. The more collaborative staff maintained satisfaction levels for patient even though the patient volumes increased.

Often the ICU, site of complex care with critically ill patients, was the research setting in which teamwork was linked with performance: ICU collaboration was associated with increased coordination and patient satisfaction, and reduced length of stay outcomes (Shortell et al., 1994); better clinical outcomes (Baggs & Ryan, 1990; Knaus et al., 1986; Wheelan et al., 2003); increased staff satisfaction (Baggs & Ryan, 1990); increased safety (Jain et al., 2006) and significant cost decreases when improvements emphasizing collaboration were implemented (Clemmer et al., 1999). In

healthcare generally and in the ICU specifically, the outcomes linked with collaboration are commensurate to those identified as requisite in a future reformed system.

Both The Society of Critical Care Medicine and American Association of Critical Care Nurses endorsed collaboration and shared responsibility for ICU leadership as a fundamental part of optimizing medical care (Barden, 2005; Brilli, et al., 2001). While both critical care organizations endorsed collaboration in concept, the nursing organization was more assertive in its demand of accountability for shared decision-making. This variance in professional position reflects the perception differences that individual physicians and nurses have regarding collaboration: ICU nurses regarded collaboration as being more important and less frequent than their medical counterparts (Thomas et al., 2003; Coombs 2003; King and Lee (1994); and Baggs et al., 1999). In research related to physician and nurse perceptions of collaboration, Miller (2001) and Coombs (2003) introduced the variable of physician power and its use in the decision-making process, and Miller (2001) raised the nurses' fears of negative consequences when raising issues with physicians.

ICUs could increase collaboration through various interventions (Boyle & Kochinda, 2004). Many improvements which increase collaboration are related to communication process: Recent implementations of standardized processes, such as multidisciplinary rounds, improved collaboration and communication (Dodek & Raboud;2003) and resulted in significantly decreased adverse events, reduced ICU length-of -stay, and reduced costs (Jain et al., 2006). Standardization of communication processes is a principle of other CRM adapted processes, such as briefings and work sheets. These briefings and work sheets resulted in improved

teamwork and collaboration with accompanying positive outcomes of reduced length of stay, cost, and increased understanding (Provonost et al.,2003; Narasimhan et al.,2006; Thompson et al.,2006). Care providers' use of SBAR, a standardized communication protocol, structures communication with the four phases of situation, background, assessment, and recommendation. Among its benefits, SBAR, used in nurse-physicians' reports, might provide a vehicle for nurses to give input into care decisions of their patients. The only reported implementation of SBAR demonstrated positive safety outcomes; the effect on collaboration and communication related to SBAR implementation is unreported.

CHAPTER III

METHODS

This study of the intensive care unit (ICU) of a Midwestern community hospital (a) examined the effect of a nurse-to-physician report protocol on physician-nurse collaboration and communication and (b) evaluated the nurse and physician attitudes toward this protocol implementation through interview.

Research Questions

The three research questions for this study were:

1. Did the implementation of SBAR, used in the ICU as nurses reported patient changes and needs to physicians, result in improved collaboration between the unit physicians and nurses as measured by the Collaborative Practice Scales and the individual subscales of the physician and nurse scales?
2. Did the implementation of SBAR, used in the ICU as nurses reported patient changes and needs to physicians, result in improved communication elements of (a) openness, (b) accuracy, and (c) understanding between the unit physicians and nurses as measured by selected scales of the ICU Nurse-Physician Questionnaire?
3. What were the Nurse and Physician Attitudes toward Collaboration and Communication Regarding SBAR Implementation as Measured by Interviews?

Study Design

The researcher addressed the first two research questions with a repeated measures design. The first research question (RQ1) was addressed with two analyses.

The first analysis used a repeated measures ANOVA to analyze the nurse composite scores and separate repeated measures ANOVA to analyze the physician composite scores. Each analysis featured one independent variable of survey administration time with three levels of pre SBAR implementation, one-month post commencement of SBAR implementation, and four-months post commencement of SBAR implementation and dependent variable of collaboration composite scores as measured on the nurse and physician Collaborative Practice Scales (Weiss & Davis, 1985). The CPS nurse and physician scales are featured in Appendix A and Appendix B. The dependent variable is represented in the six cells of Figure 1.

The researcher compared the demographic information provided by the nurses and physicians on short surveys (Appendix C and Appendix D) to determine candidate variables as covariates. Potential covariates included age, credentials, and citizenship status.

The second analysis featured four separate analyses of the CPS nurse subscales: “direct assertion of professional expertise/opinion” and “active clarification of mutual responsibilities” (Weiss & Davis, 1985, p. 299) and the CPS physician subscales, “consensus development with nurses” and “acknowledgment of nurse contribution to patient care” (Weiss & Davis, 1985, p. 299). (As shown in Figure 2, the independent variable of the repeated measures design for each of the four subscales was the survey administration time with levels of pre SBAR implementation,

	Pre SBAR	Post-SBAR 1 month	Post-SBAR 4 months
Nurses	Collaboration Scores on CPS—Nurse Scale	Collaboration Scores on CPS—Nurse Scale	Collaboration Scores on CPS—Nurse Scale
Physicians	Collaboration Scores on CPS—Physician Scale	Collaboration Scores on CPS—Physician Scale	Collaboration Scores on CPS—Physician Scale

Figure 1. The dependent variable of RQ1 Analysis was the CPS composite scores.

one-month post SBAR implementation commencement, and four-months post SBAR implementation commencement); each dependent variable was the respective CPS subscale score.

The design used an analysis of covariance (ANCOVA) with potential covariates including age, credentials, citizenship status, specialty and subspecialty (physician), and education (nurses). The potential covariate information was collected on short demographic surveys, shown in Appendix C and Appendix D.

The second research question, RQ2, was addressed through a mixed factorial 2 x 3 design with pre- and post-repeated measures of the nurse-physician attitudes toward the communication elements of openness, accuracy and understanding. RQ2, as shown in Figure 3, was addressed in one analysis. The independent variables were professional group with two levels of physicians and nurses and the survey

administration time with three levels of pre SBAR implementation, one-month post SBAR implementation commencement, and four-months post commencement SBAR implementation. The dependent variables were communication element scores

Pre-SBAR	Post-SBAR 1-month	Post-SBAR 4 months
CPS Nurse Subscale 1 "direct assertion of professional expertise/opinion" scores	CPS Nurse Subscale 1 "direct assertion of professional expertise/opinion" scores	CPS Nurse Subscale 1 "direct assertion of professional expertise/opinion" Scores
CPS Nurse Subscale 2 "active clarification of mutual responsibilities" scores	CPS Nurse Subscale 2 "active clarification of mutual responsibilities" scores	CPS Nurse Subscale 2 "active clarification of mutual responsibilities" scores
CPS Physician Subscale 1 "consensus development with nurses" scores	CPS Physician Subscale 1 "consensus development with nurses" scores	CPS Physician Subscale 1 "consensus development with nurses" scores
CPS Physician Subscale 2 "acknowledgment of nurse's contribution to patient care" scores	CPS Physician Subscale 2 "acknowledgment of nurse's contribution to patient care" scores	CPS Physician Subscale 2 "acknowledgment of nurse's contribution to patient care" scores

Figure 2. CPS subscales analyses.

of openness, accuracy, and understanding, as shown in Figure 3. The openness, accuracy, and understanding elements were measured on between-group communication scales of the ICU Nurse-Physician Questionnaire (Shortell, Rousseau, Gillies, Devers, & Simons, 1991). The survey developed using the ICU Nurse-Physician Questionnaire between-group scales are shown in Appendix E and Appendix

F. The potential covariate information was collected on short demographic surveys, shown in Appendix C and Appendix D.

	Pre SBAR	Post SBAR 1 month	Post SBAR 4 months
Physicians	Openness Scores	Openness Scores	Openness Scores
	Accuracy Scores	Accuracy Scores	Accuracy Scores
	Understanding Scores	Understanding Scores	Understanding Scores
Nurses	Openness Scores	Openness Scores	Openness Scores
	Accuracy Scores	Accuracy Scores	Accuracy Scores
	Understanding Scores	Understanding Scores	Understanding Scores

Figure 3. In RQ2 the dependent variables were the communication element scores of openness, accuracy, and understanding as measured by the ICU Nurse-Physician Questionnaire.

To address RQ3, the researcher interviewed physicians and nurses working on the ICU 4-months after the SBAR implementation commencement. As shown in the Physician and Nurse Interview Protocols, Appendix G and Appendix H, the open-ended questions were based on: (a) Selected questions based on participant response to the Collaboration Practice Scales (Weiss & Davis, 1985) and The Nurse-Physician Questionnaire (Shortell, et al., 1991) and (b) questions contextualized within the participant experience with the implementation of SBAR.

Site Selection of the Hospital and Its Context

The researcher first approached three other facilities about research participation. These site authorities either did not want to participate in SBAR implementation or could not agree to the implementation framework or schedule. Conversely, the chief executive officer (CEO) and the chief nursing officer (CNO) of Community Hospital strongly supported the ICU implementation strategy as a preliminary step to hospital-wide SBAR implementation by nurses when they reported patient changes and needs to physicians. The two leaders believed that a standardized report format would improve safety and the organization scores on a survey administered by a statewide agency. The agency had reported the results in 2006 of its Statewide Organizational Approaches to Retention Strategies survey (SOARS). The results of the survey, by which nurses' attitudes toward physicians, physician collaboration with nurses, and their communication were measured, implied that Community Hospital had opportunities to improve.

The site was a 20-bed critical care unit in a Midwestern community hospital named Community Hospital (pseudonym). The critical care unit consisted of a ten-bed ICU and a ten-bed cardiac intensive care unit (CCU). The ICU staff treated surgical and medical critically ill patients, including cardiac and vascular surgery and neurosurgery; the CCU staff treated critical patients suffering from heart attacks and congestive heart failure. The combined critical care unit employed fifty full- and part-time RNs, who passed the same clinical competency examinations (Advanced Cardiac Life Support), reported to the same manager and, while generally assigned to one unit, worked on both the ICU and the CCU.

The not-for-profit 300-bed Community Hospital considered the 10 rural counties with a 350,000 population as its multi-county service area. The modern and technologically advanced facility had 1,400 employees with a 210 member medical staff, which represented primary care and such specialties as pediatrics, psychiatry, bariatric surgery, neurosurgery, and oncology. The hospital received national recognition for outstanding care for stroke patients.

Implementation of SBAR

The researcher worked with a Community Hospital taskforce, comprised of the Director of Inpatient Services, the Director of Quality Management, and the Manager of ICU, to develop the initial plan to implement SBAR in nurse to physician reports. The taskforce agreed that staff would be involved in planning, teaching, and coaching this change. The methodology of staff leading change emanates from Rogers (1995), who posited that peer-to-peer communication and social networks were important components in the adoption of change. The ICU nurse manager selected three nurse “opinion leaders” from the combined critical care unit day shift and three from the night shift to plan, teach, and advocate the SBAR adoption.

The ICU staff team, in collaboration with the researcher and a nurse educator, designed a required class for all part-time and full-time nurses to introduce the concept, to define the parameters of its use, and to participate in role-play scenarios. The team also implemented such learning aids as posters and report templates (Haig et al., 2006). The team decided that nurse preceptors, who oriented nurses, would provide feedback to new nurses when they used the SBAR format in reports to physicians. Additionally,

the team developed and delivered SBAR training for physicians, who comprised the sample.

Having discussed the study research design, the site selection, and the SBAR implementation, the researcher now addresses each research question according to sample selection, instrumentation, data collection, and data analysis.

RQ1: Did the Implementation of SBAR, Used in the ICU as Nurses Reported Patient Changes and Needs to Physicians, Result in Improved Collaboration between the Unit Physicians and Nurses as measured by the Collaborative Practice Scales and the Individual Subscales of the Physician and Nurse Scales?

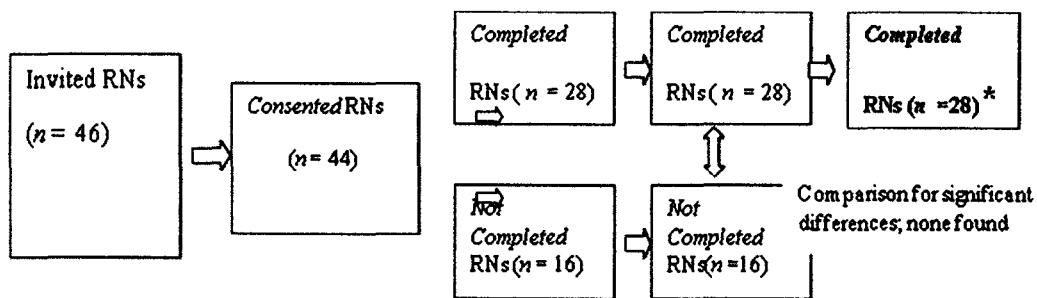
Sample Selection

All part-time and full-time registered nurses employed in the combined critical care unit ($n = 50$) were trained in the implementation. All part-time and full-time nurses, with the exception of the four-implementation team nurses ($n = 46$) were invited to complete the Collaborative Practice Scales survey, which assessed their attitudes related to collaboration, selected scales of the ICU Nurse-Physician Questionnaire, and the background questionnaire (Appendix C). Using the administration protocol (Appendix L), the researcher initially administered the questionnaires at staff meetings. Since staff meetings were held in a crowded room with minimal seating and attendance, the researcher administered subsequent surveys individually.

Forty-four nurses qualified as *consented*, signifying that they responded to at least one survey set. The consented sample was 95.65% of the possible sample. The researcher described the two data subsets that comprised the nurse *consented* sample

($n = 44$): (a) *completed* nurses ($n = 28$) responded to all three survey sets; (b) *not completed* nurses ($n = 16$) responded to one or two survey sets but did not respond to all three survey sets. Only data from the *completed* nurses were used in the RQ1 and RQ2 analyses. The researcher presents the relationship of the nurse and physician samples in Figure 4.

At Community Hospital all physicians credentialed as medical staff members could admit or treat patients in the ICU/CCU, but a majority rarely worked in the unit. To obtain stability in the physician sample, the researcher selected the physician sample based on the number of critical care patients whom the physicians admitted, treated, or consulted on from June 2006 through June 2007. Based on hospital medical staff appointment reports, 45 primary care and specialty physicians met the criteria of at least five ICU admissions or consultations during this time period. Because she excluded a physician relative and a physician advocate of the SBAR implementation, the researcher invited 43 physicians to participate in the study ($n = 43$).



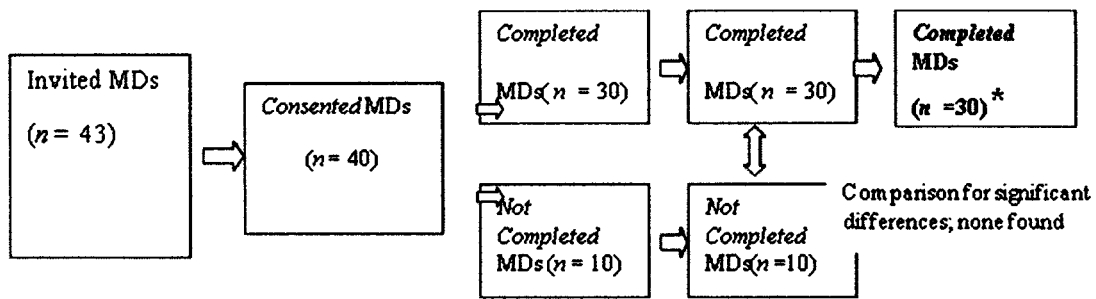


Figure 4. The relationship of the nurse and physician samples is displayed above.

Denoted by *, only *completed* RNs and MD sample responses are utilized in RQ1 and RQ2 analyses.

Physicians who responded to at least one survey set were identified as *consented* ($n = 40$). The *consented* physician sample had two data subsets: (a) *completed* physician sample ($n = 30$), comprised of physicians who responded to all three administrations; (b) *not completed* physician sample ($n = 10$), comprised of those who completed at least one survey but did not complete all three surveys.

Instrumentation to Address RQ1: The Collaborative Practice Scales (CPS)

Weiss and Davis (1985, p. 299) defined collaborative practice as “interactions between nurse and physician that enable the knowledge and skills of both professionals to synergistically influence the patient care being provided.” The CPS authors based the instrument on the concepts of Blake and Mouton (1970), Thomas (1982), and Thomas and Kilman (1978). The CPS scales measure collaboration features in the relationship between nurses and physicians (Weiss & Davis, 1985).

The CPS, in turn, is comprised of two scales: the nurse scale and the physician scale (Appendix A and Appendix B). The CPS scale for nurses measures two subscales with nine items: (a) Nurse-Subscale 1, the direct assertion of professional

expertise/opinion and (b) Nurse-Subscale 2, active clarification of mutual responsibilities (Weiss & Davis, 1985). The participant responds to a six-point Likert-type scale (*never* to *always*). On the CPS nurse scale, as shown in Appendix I, Nurse-Subscale 1, comprised of items 3, 5, 7, and 8, has a possible score of 24; Nurse-Subscale 2, comprised of items 1, 2, 4, 6, and 9, has a possible score of 30. The total possible score on the Nurse CPS scale is 54. Higher scores signify higher levels of collaboration (Dougherty & Larson, 2005). CPS scoring guidelines are explained in Appendix H.

The physician scale of 10 items measures two subscales: (a) Physician Subscale 1, comprised of items 5, 6, 7, 8, and 9, measures the consensus development with nurses (b) Physician Subscale 2, comprised of items 1, 2, 3, 4, and 10, measures the acknowledgment of the nurse's contribution to patient care and (Weiss & Davis, 1985, p. 299). As shown in Appendix I, the CPS physician scale has a possible score for each subscale of 30 with a possible total collaboration score of 60. Weiss and Davis (1985) also published validity and reliability studies for the CPS, which was recommended for nurse-physician collaboration research following a peer review journal literature review between 1990 and May 2004 (Dougherty & Larson, 2005).

The validity of the CPS. Weiss and Davis (1985) tested the psychometric characteristics of construct validity, concurrent validity, predictive validity, and reliability (Weiss & Davis, 1985). They analyzed the instrument characteristics with nurses ($n = 200$) and physicians ($n = 200$) randomly selected from a large health science center in a metropolitan Western area. The various dimensions of validity are presented according to this format: (a) description of the test for each type of validity or

reliability; (b) application of the test to the nurse scale and the results; and (c) application of the test to the physician scale and the results.

To determine the construct validity for each scale, the survey developers performed a principle axis factor analysis succeeded by Varimax and direct oblimin rotations. The results of the principle axis factor analysis, with items which loaded on factors circled, also are shown in Appendix I. The CPS nurse scale construct validity test produced two subscales: Nurse Subscale 1, direct assertion of professional expertise/opinion, loaded on by items 3, 5, 7, and 8. Nurse Subscale 1: 1 was responsible for 37.2% of the total variance (eigenvalue = 3.35); Nurse Subscale 2, active clarification of mutual responsibilities, loaded on items 1, 2, 4, 6, and 9. The researcher will refer to this subscale as Nurse Subscale 2. Nurse 2 was responsible for 20% of the total variance (eigenvalue = 1.76). Orthogonal and oblique rotations of these data confirmed “the two clearly differentiated factors, [subscales] identical to those of previous testing” (Weiss & Davis, 1985, p. 301).

The CPS physician scale construct validity test, a principle axis factor analysis succeeded by Varimax and direct oblimin rotations, produced two subscales. Physician Subscale 1, consensus development with nurses, loaded on items 5, 6, 7, 8, and 9, as shown in Appendix I. The Physician Subscale 1 was responsible for 46% of the total variance (eigenvalue = 4.17). Physician Subscale 2, acknowledgment of the nurse’s contribution to patient care, loaded on items 1, 2, 3, 4, and 10. Physician Subscale 2: was responsible for 14% of the variance (eigenvalue = 1.27) (Weiss & Davis, 1985).

Weiss and Davis (1985) assessed concurrent validity with correlation by Spearman coefficients of the CPS results with results of The Health Role Expectations

Index (HREI) and The Management of Differences Exercise (MODE). In 1983 Weiss and Davis (as cited in Weiss & Davis, 1985) submitted that the HREI had demonstrated discriminate validity ($p < .001$), predictive validity ($p < .01$), and internal consistency reliability ($\alpha = .82$) and a test-retest correlation of .77. Weiss and Davis (1985) cited Kilmann and Thomas (1977) that the test-retest coefficient for the MODE was .66.

To establish the nurse scale concurrent validity, the developers established that nurse scores on eight of the nine CPS items correlated significantly with nurse scores on the HREI ($r_s = .25, p < .01$). The nurse CPS scores showed no correlation with scores on the collaboration mode of the MODE.

On the concurrent validity assessment with the HREI and MODE, the physician scales of the CPS demonstrated that Physician Subscale 1 items were most significantly correlated with the collaborative management of difference ($r_s = .22, p < .05$). Neither of the physician CPS subscales was correlated with the total HREI score, which measured the overall receptivity to collective accountability. A significant association existed between Subscale2 of the physician scale and physician scores on the nurse dimension of the HREI. The nurse dimension measured physician acceptance of increased nurse responsibility ($r_s = .26, p < .01$).

To demonstrate predictive validity, the survey developers requested that each sample member select a colleague of the contrasting profession (i.e., a nurse selected a physician), who evaluated him on his "interprofessional practice" (Weiss & Davis, 1985, p. 302). Weiss and Davis (1985) predicted that the CPS scores of the subjects would be significantly correlated using Spearman coefficients with the scores of colleagues who evaluated the subjects. The researchers reported the Spearman

correlation coefficients of the total CPS retest scores of physicians and their nurse peer evaluations: the correlations were positive and significant ($r_s = .42, p < .02$).

Conversely, the CPS scores did not predict the nurse practice as interpreted by the physicians: No significant correlation existed between nurse scores on their CPS retest and scores of the physician peer evaluations.

Weiss and Davis (1985) posited that additional analysis findings had implications for the predictive validity. The researchers submitted that educational background and healthcare role were predictive variables for nurses: Nurses who identified themselves as clinicians in the demographic section ($n = 80$) were significantly lower in their CPS scores ($M = 39.2$) than nurses ($n = 15$) who described their roles as educators, administrator, or researcher ($M = 43.9; t(93) = 2.8, p < .006$). Also nurses who had earned a baccalaureate degree ($n = 73$) showed significantly higher Nurse Subscale 1 CPS scores ($M = 21.2$) than nurses ($n = 20$) who had earned a diploma or associate degree ($M = 20; t(91) = 2.10, p < .04$).

The researchers also reported implications for the predictive validity of the Physicians Scale: Gender appeared to be a predictive variable for physicians. The 14 female physicians gave significantly higher Nurse Subscale 2 scores ($M = 24.1$) than the 75 male physicians ($M = 20.8; t(87) = 2.69, p < .008$).

The reliability of the CPS. To establish the reliability of each scale, the researchers reported Cronbach's alpha coefficients on initial testing and at retest for both CPS scales. Six weeks following the initial test administration, the survey developers again administered the surveys. The nurse scale received the following Cronbach's alpha coefficient scores on Nurse Subscale 1, the direct assertion of

professional expertise/opinion, and Nurse Subscale 2, active clarification of mutual responsibilities (Weiss & Davis, 1985) and on the total CPS scale: (a) initial testing: Nurse Subscale 1, .77; Nurse Subscale 2, .75; and CPS total score, .80 and (b) retest: Nurse Subscale 1, .73; Nurse Subscale 2, .76; and CPS total score, .83.

Weiss and Davis (1985) also reported initial test and retest Cronbach's alpha coefficients on the (a) Physician Subscale 1, consensus development with nurses, and (b) Physician Subscale 2, acknowledgment of the nurse's contribution to patient care, (Weiss & Davis, 1985, p. 299), and on the total CPS score. The Cronbach's alpha coefficient scores for the physician scale follow: (a) initial testing: Physician Subscale 1, .72; Physician Subscale 2, .77; and CPS total score, .84 and (b) retest: Physician Subscale 1, .75; Physician Subscale 2, .77; and CPS total score, .85 (Weiss & Davis, 1985).

To further address the internal consistency of the CPS, the developers also performed Spearman's correlations to evaluate the relationship between subscale and the relationship of the subscale to the CPS composite score. They reported that the results supported the internal consistency of the CPS: the two nurse scale subscales were correlated ($r_s = .41, p < .001$); the two physician subscales were also correlated ($r_s = .54, p < .001$). The researchers reported, "Factors [Subscales] were more highly correlated with their total scale scores, ranging from .73 (Factor [Subscale]1) to .93 (Factor [Subscale] 2) for the nurse CPS and .87 (Factor[Subscale] 1) and .88 (Factor [Subscale]2) for the physician CPS" (Weiss & Davis, 1985, p. 302). Spearman coefficients for total score and for subscale scores on the nurse scale were significant (p

< .0001). Additionally, every item on the nurse and physician scales correlated significantly with its subscale score and its CPS composite score ($p < .001$).

Six weeks following the initial test administration, the survey developers again administered the surveys and correlated the subscales and total scores using Spearman correlations. Weiss and Davis stated, "Correlations for total score and factor [subscale]retest were significant across both scales although factors [subscales]on the nurse CPS seemed more reliable" ($p < .0001$) (Weiss & Davis, 1985, p. 302).

Data Collection

The researcher administered the instruments to both physicians and nurses three times: (a) prior to protocol implementation; (b) one-month following the implementation commencement; and (c) four-months following the implementation commencement. To reduce variation in the initial administration of the protocol, the researcher employed a script (Appendix K).

To optimize response rates, the researcher introduced and administered the paper surveys to nurses at mandatory staff meetings (Babbie, 1990). The researcher kept a log of the nurses who completed the surveys. To optimize the return rate, the researcher administered the surveys individually to nurses who missed the meeting. Following the initial administration, the nurses requested being given the survey, completing it at convenient times, and returning it to the designated box on the unit.

For physicians, the researcher employed a similar administration method: (a) an initial administration to physicians at regularly scheduled critical care and other meetings, (b) identification of physician respondents in a log, and (c) individual administration with physician. Following the initial administration, physicians asked

that surveys be left in an unsealed envelope in their medical records mailboxes. When they completed their surveys, they sealed and left the envelope with the manager, who contacted the researcher. After the survey administration was deemed complete, the researcher obtained the completed surveys from the box and, as required by the University of Louisville Institutional Review Board, kept them in a locked file cabinet in her secured office.

Data Analysis

The researcher presents the data analysis details in three subsections: Data Management, Statistical Analysis, and Primary Analysis. RQ1 features two analyses: (a) an analysis of the CPS nurse scale and physician scale composite scores and (b) four separate analyses of each individual subscale of the nurse and physician scales. The data analysis, management, statistical analysis and primary analysis subsections applied to each RQ1 analysis.

Data Management

The researcher utilized SPSS for all statistical analyses of the repeated measures with-in subjects design. The researcher used a repeated measures analysis of variance (ANOVA). Nurse scores on the CPSs were compared over the three data collection points. A separate repeated measures ANOVA statistics were calculated for the CPS composite and for each of the two nurse subscale scores. The significant effects detected by these statistics were further addressed by Bonferroni post hoc comparisons of the means at the data collection points.

Prior to performing the ANOVA, the researcher insured through the prescribed tests that required assumptions for the mixed ANOVA were met: normality,

homogeneity, independence, and sphericity (Keppel, 1991). Recommended counterbalancing techniques of alternating sequences among subjects were impossible to accomplish due to the particular study of SBAR implementation in a hospital rather than a laboratory (Keppel, 1991). The researcher utilized the significance level ($p = .05$ for analysis) of the main effects and the interactions (Keppel, 1991).

The database and entry screens for this project were developed using Microsoft Excel spreadsheets. To minimize errors, all entry cells were programmed to detect inconsistent and invalid data. Specifically, data were checked for invalid codes, values that are out of range, and invalid dates and skip patterns. All data once entered into the spreadsheets were verified against the original forms. This database was converted to a Statistical Analysis Software (SAS) data set for analysis.

Statistical analyses. The researcher compared CPS data collected at baseline and additional administrations, including response and demographic data collected with the seven-question surveys located in Appendix C and Appendix D. She compared the nurse and physician groups to determine similarities between the groups in the first sample prior to intervention introduction, the second sample and the third sample. These comparisons assessed the effectiveness of the randomization. The researcher also compared the same variables by subject group between subjects who completed the study and those who failed to complete the study. This comparison assessed for differential dropout between the study groups. The researcher compared categorical demographic variables with chi square tests and compared continuous measures with t tests. Since the CPS and TICU N-P Q assessed different constructs, the researcher did

not develop composite scores of the outcome variables to minimize the probability of inflated type I error.

RQ2: Did the Implementation of SBAR, Used in the ICU, as Nurses Reported Patient Changes and Needs to Physicians, Result in Improved Communication Elements of (a) Openness, (b) Accuracy, and (c) Understanding between the Unit Physicians and Nurses as Measured by Selected Scales of The ICU Nurse-Physician Questionnaire?

The researcher employed the between group communication scales of the Nurse Physician Questionnaire (Shortell, 1991) to assess RQ2. Similar to the CPS, the ICU Physician-Nurse Questionnaire also was recommended following a peer-review journal literature review between 1990 and May 2004, for nurse-physician collaboration research (Dougherty & Larson, 2005).

Sample Selection

The nurses ($n = 46$) and physicians ($n = 43$), who were invited to complete ICU Physician-Nurse Questionnaire, were the same samples that completed the CPS.

Instrumentation to Address RQ2: The ICU Physician-Nurse Questionnaire

The ICU Physician-Nurse Questionnaire is a lengthy survey, which assesses organizational culture, communication, coordination, conflict management practices, and leadership. To address the second research question, the researcher employed all communication scales between physicians and nurses (i.e., physicians evaluated communication elements with nurses rather than with fellow physicians) of the ICU Physician-Nurse Questionnaire and results of previously described demographic survey

(Appendix C for nurses and Appendix D for physicians). The comprehensive survey is comprised of separate physician and nurse scales (Appendix E and Appendix F).

Shortell et al. (1991) measured the following between-group communication elements : (a) Openness, assessed by four Likert-type items, is the extent to which nurses and physicians are able to express what they mean without fear of negative reactions or conflict; (b) accuracy, a three-item scale, is the degree to which nurses and physicians trust the correctness of the information given to them by the other party; and (c) understanding, assessed by an eight-item scale, is the degree to which nurses and physicians believe that the communication with the other professional group is comprehensive and effective. (Appendix K includes the Between-group Communication Scales and Component Questions of The ICU Physician-Nurse Questionnaire.) The respondent evaluated all items on a five-point Likert-type scale (*Strongly Disagree to Strongly Agree*).

The Validity of The ICU Physician-Nurse Questionnaire. Shortell et al. (1991) piloted a single survey to five medical surgical ICUs in four Chicago area hospitals. Based on the pilot, the survey authors replaced the single survey with two profession specific surveys. The survey authors administered the revised survey to a national sample of 42 medical/surgical ICUs in 40 hospitals. The hospitals of greater than 200-bed size were deemed representative related to bed size, ownership, occupancy, region of the country, and medical school affiliation status. The survey was administered to all ICU nurses on all shifts and to full- and part-time salaried physicians, residents, high-volume ICU admitting physicians, and unit secretaries.

Nurses completed 1,418 surveys (return rate = 78%); physicians completed 790 surveys (return rate = 65%), and unit secretaries completed 111 surveys (return rate = 65%).

Shortell et al. (1991) reported the correlation matrix of the subscales provided evidence of convergent and discriminant validity. Convergent validity of the subscales is demonstrated by (a) the significant correlation of the between-group openness subscale with the satisfaction with physician communication subscale ($r = .62, p \leq .05$); (b) the significant correlation between group openness subscale and between-group understanding subscale ($r = .74, p \leq .05$); and (c) the significant correlation between group accuracy subscale with between-group understanding subscale ($r = .49, p \leq .05$). The researchers did not report r^2 values.

Conversely, the lack of correlation of the between-group arbitration conflict strategy subscale with the three communication subscales, considered in this research, demonstrates evidence of discriminant validity: (a) between-group arbitration conflict strategy subscale is not correlated significantly with between group openness ($r = -.09, p \leq .05$); (b) between group arbitration conflict strategy subscale is not correlated with between-group ($r = -.09, p \leq .05$); and (c) between-group arbitration conflict strategy subscale is not correlated with between-group understanding ($r = -.05, p \leq .05$). The researchers defined the between group arbitration conflict strategy subscale: "The degree to which disagreements are brought to superiors for resolution" (Shortell et al., 1991, p. 725).

The Reliability of The ICU Physician-Nurse Questionnaire. Shortell et al. (1991) used Cronbach's alpha to assess the internal consistency of the items of each scale. The developers cited Ghiselli, Campbell, and Zedeck (as cited in Shortell et al.,

1991) and reported that “almost all the scales demonstrate good to high reliability using .70 as the most commonly accepted cutoff criteria” (p. 714). The Cronbach’s alphas of the between group (BG) communication element scales follow: (a) openness, (BG), .88; (b) accuracy, (BG), .74; and (c) understanding (BG), .86.

Data Collection

The researcher used the same procedure and sample to administer The ICU Physician-Nurse Questionnaire as she used to administer the CPS. The researcher administered the instruments three times: (a) prior to protocol implementation; (b) one-month following the implementation commencement; and (c) four-months following the implementation commencement. To reduce variation in the initial administration, the researcher employed a script (Appendix K).

Data Analysis

The researcher managed and analyzed the data generated from The ICU Nurse Physician Questionnaire with the same steps and principles as used with the CPS data from RQ1.

RQ3: What Were the Nurse and Physician Attitudes toward Collaboration and Communication Regarding SBAR Implementation as Measured by Interviews?

The researcher presents the sample selection, the data collection analysis, and the trustworthiness of the data.

Sample Selection

The researcher selected a representative sample of nurses ($n = 10$) and physicians ($n = 10$) to approximate the demographics of the completed nurse sample ($n = 28$) and the completed physician sample ($n = 30$) so that one might infer their conclusions as representative of the group. Table 1 presents the comparison of the *interviewed* nurses with the *completed* nurses on such demographics as age, gender citizenship, and educational and professional certification attainment;

Table 1

Comparison of *Interviewed* Nurse Sample with *Completed* Nurse Sample

Demographic	<i>Interviewed</i> Sample ($n = 10$)	<i>Completed</i> Nurse Sample ($n = 28$)
Variable	Percentage	Percentage
Age	45.87	45.80
Gender	100% Female	92.9%
Citizenship Status	90% U.S. Natives 1 Incomplete Response	96.4% U.S. Natives 1 Incomplete Response
Highest Obtained Degree	40% Associate of Arts 50% Bachelor of Arts	57.1% Associate of Arts 42.9% Bachelor of Arts
Advanced Certification	50% had advanced certification	35.7% had advanced certification

Note: Because one interviewed nurse had not completed the background questionnaire, the percentages of all *interviewed* nurses demographic categories do not equal 100%.

Table 2 records the comparable demographic comparison for *interviewed* physicians with *completed* physicians. In the nurse gender demographics, 7.1% (three males) of the completed nurse sampler were males; three males comprised the *completed* nurse sample, but no males were interviewed. The researcher asked to interview two of the three males, but they declined.

Table 2

Comparison of *Interviewed* Physician Sample with *Completed* Physician Sample

Sample	<i>Interviewed</i> Sample	<i>Completed</i> Physician
Demographic	(<i>n</i> = 10)	(<i>n</i> = 30)
Variable	Percentage	Percentage
Age	49.33 years	56.10 years
Gender	90% Male	93.33% Male
Citizenship Status	60% U.S. Naturalized 40% U.S. Natives	43.33% U.S. Naturalized 46.67% U.S. Natives 3.33% Foreign National 6.66% Other
Board Certification in Specialty or Primary Care	90% Board Certified	86.7% Board Certified
Board Certification in Respective Specialties	50% Board Certified	46.70% Board Certified

Figure 5 depicts the relationship of the *interviewed* sample and the *completed* sample and statistical tests employed in the analysis of the CPS.

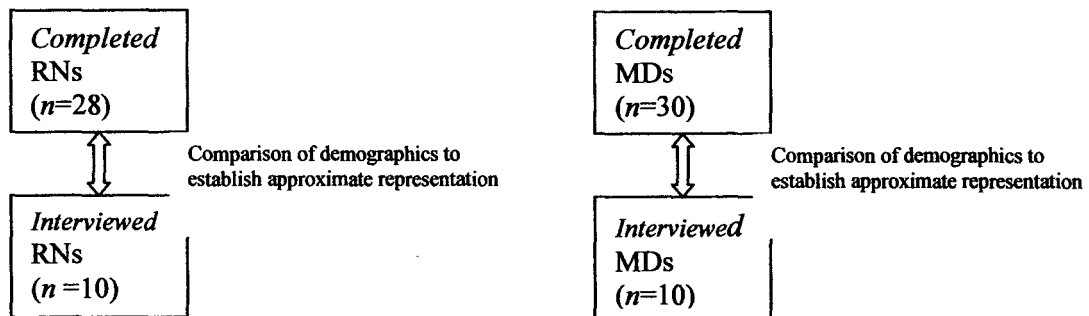


Figure 5. The representational sample of RQ3.

Data Collection Methods

The researcher conducted the first round of semi-structured interviews scheduled for 60 minutes with nurses and physicians. The researcher developed two open-ended interview protocols for nurses and physicians (Appendix G and Appendix H). The protocols were formulated to allow participants to express their opinions about the SBAR implementation. Most of the questions were follow-up questions to specific survey questions in the CPS or The ICU Physician-Nurse Questionnaire. The open-ended format of the protocols afforded the interviewees the opportunity to describe in their own diction and to stress any concerns, ambiguities, or detail (Larson, Hamilton, Mitchell, & Eisenberg, 1998).

The researcher completed a second round of interviews with the *interviewed* nurses ($n = 10$) of approximately 30 minutes. The interviews' primary purpose was to check the themes emerging from the first-round interview data. Because of physicians' demanding schedules, the researcher did not conduct a second-interview round with physicians.

The researcher introduced and conducted all interviews under the following conditions: (a) inquiry for permission to audiotape the conversation; (b) assurance of confidentiality; (c) signature of consent form; (d) encouragement to the interviewees to spend as much time as they wished in answering; (e) reading of scripted questions (Appendix G and Appendix H), exactly as they were written and in the prescribed order, (f) following with spontaneous probes appropriate to the interviewee's responses; and (g) supplying clarification by repeating, defining terms as specified on the definition sheet (APPENDIX L) (Salant & Dillman, 1994), or by answering "However you think or perceive the concept" (Salant & Dillman, 1994).

Additionally, the researcher transcribed interpretative comments in field notes of the interviewee and the interview process (Miles & Huberman, 1994). For example, when the gestures or expressions of an interviewee either reinforced or negated his statement, the researcher noted these expressions in the research log and their possible meaning for subsequent analysis.

Data Analysis

The researcher audio taped and transcribed all interviews. Using the software Atlas.ti 5, the researcher analyzed the data transcribed from interviews and from field notes in these steps: (a) selection of preliminary codes to identify subjects of transcripts

and observation field notes; (b) iterative process of recoding with each new interview and observation analysis; (c) “sorting and sifting through” (p. 9) the coded material to identify commonalities (i.e., phrases, patterns, or themes); (d) further investigation and challenging of the commonalities and emerging conclusions in the next interviewing round; and (e) presentation of the accepted themes and generalizations which emerged from the data (Miles & Huberman, 1994). The researcher depicts this process in

Figure 6.

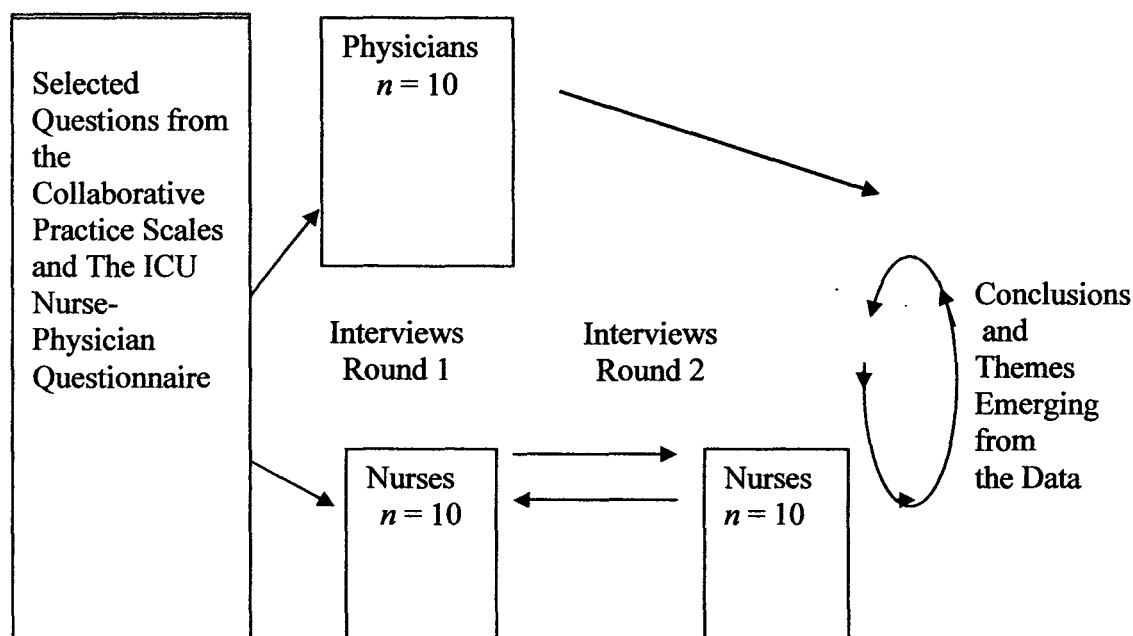


Figure 6. Constant comparative analysis.

The researcher analyzed the data initially by nurse and physician samples; she next compared and contrasted the results of the two samples.

Trustworthiness of the Data

The researcher achieved trustworthiness of her conclusions by methods which produce credibility: (a) multiple sources of data collection and (b) member checks of research participants (Rossman & Rallis, 2003). The researcher based the conclusions on several methods of data collection: (a) the survey data of the Collaborative Practice Scales and The ICU Nurse-Physician Questionnaire, (b) the interviews with nurses and physicians, and (c) the transcribed field notes. The researcher compared the individual qualitative responses to the interviews with the group quantitative results of the CPS and The ICU Nurse-Physician Questionnaire and with the transcribed field notes. Disagreement in these data would prompt additional questions in subsequent interviews. After the researcher completed the iterative coding and interviewing process, she identified preliminary themes and conclusions.

CHAPTER IV

RESULTS

In this chapter the researcher presents the statistical analyses and results to address the first two research questions and the themes emerging from physician and nurse interviews to address the third research question. In Research Question One (RQ1), the researcher investigated whether the SBAR implementation had improved collaboration between physicians and nurses in the ICU as measured on the Collaborative Practice Scales and the individual subscales of the nurse and physician scales. To organize RQ1 results, the researcher first presents the nurses' data, followed by the physicians. Within each profession section, she presents: (a) the samples of those nurses and physicians who *completed* and *did not complete* the survey and a comparison of the two sets of samples for significant differences, and (b) the descriptive and statistical analyses of CPS composite and subscale scores.

In Research Question Two (RQ2), the researcher considered whether the SBAR implementation had improved the communication elements of openness, accuracy, and understanding between nurses and physicians as measured on selected scales of the ICU Nurse-Physician Questionnaire. To organize these results, she presents: (a) the samples and samples comparisons and (b) the descriptive and statistical analyses of each communication element.

These RQ1 and RQ2 findings are generally supported, clarified, and amplified by the findings, themes, and quotations generated by the RQ3 interview analysis. Additional findings regarding the SBAR *Recommendation* phrase emerged from the data. The researcher organized the interview findings presentation by question in category and subcategory headings.

RQ1: Did the Implementation of SBAR, Used in the ICU as Nurses Reported Patient Changes and Needs to Physicians, Result in Improved Collaboration Between the Unit Physicians and Nurses as Measured by the Collaborative Practice Scales and the Individual Subscales of the Physician and Nurse Scales?

This research question was addressed by comparing nurse scale CPS composite and two nurse subscale scores over three data collection points and then by comparing physician scale CPS composite and two physician subscales scores over the same collection points: Time 1, pre-SBAR implementation; Time 2, 1- month post-implementation; and Time 3, 4- months post- implementation. The statistical analyses were repeated-measures ANOVAs: Three repeated measures ANOVAs examined the nurse CPS composite scores and the two nurse subscales over three times; three ANOVAs analyzed the respective physician scores over the same times. Implementation of SBAR, used in the ICU when nurses communicated patient changes and needs to physicians, significantly improved nurse-physician collaboration from the first data collection (Time 1) to the third data collection (Time 3). The ANOVAs performed on physician scores, however, revealed that implementation of SBAR, used in the ICU when nurses communicated patient changes and needs to physicians, had not significantly improved nurse-physician collaboration.

The data generated by the three administrations of the CPS and by the subsequent statistical analyses are presented in two sections: (a) nurses and (b) physicians. Within the nurses and physicians sections, the researcher addresses the demographics and the CPS composite and subscale scores. Within the CPS composite and subscale scores subsections, the researcher presents the descriptive statistics and inferential statistical analysis.

Nurses

The researcher addresses the samples and demographics of the research participants, and the composite and subscale scores generated by the CPS data for nurses.

Sample

Forty-four nurses were designated as *consented*, signifying that they responded to at least one survey set. The researcher describes the two data subsets that comprised the nurse *consented* sample: (a) *completed* nurses ($n = 28$) responded to all three survey sets; (b) *not completed* nurses ($n = 16$) responded to one or two survey sets but did not respond to all three survey sets. Only data from the *completed* sample was used in the RQ1 analysis.

Sample Demographics

The demographic data, generated from the background questionnaire, for the *completed* and *not completed* samples are presented in Table 3.

Completed nurse sample. Twenty-eight of the *consented* nurses ($n = 44$) were designated as *completed*; this category comprised 63.64% of the *consented* sample.

Reflective of the nursing profession demographics, females ($n = 26$) outnumbered

Table 3

Demographic Data for Nurses Who Completed ($n = 28$) and Not Completed ($n = 16$)

Statistical Analysis	Completed ($n = 28$)		Not Completed ($n = 16$)		
	n^1	% ¹	n^2	% ²	
Gender					
Female	26	92.9%	15	93.80%	$\chi^2 (df = 1) = .013, p = .91$
Male	2	7.1%	1	6.3%	
Citizenship Status					$\chi^2 (df = 1) = .682, p = .68$
U.S. native	27	96.4%	15	93.80%	
Did not complete question	1	3.6%	1	6.3%	
Highest Degree Obtained					$\chi^2 (df = 2) = 7.035, p = .03$
Associate of Arts	16	57.1%	10	62.50%	
Bachelor of Arts	12	42.9%	3	18.80%	
Did not complete question			3	18.80%	
Advanced Certification					$\chi^2 (df = 1) = .682, p = .68$
No	18	64.3%	9	56.30%	
Did not complete			2	12.50%	
Yes	10	35.7%	5	31.30%	$\chi^2 (df = 2) = 3.667, p = .16$
ACLS	9	32.2%	4	25%	
CCRN	1	3.6%	0	0	

Note: n^1 heads the column identifying the completed sample number; %¹ heads the column identifying the completed samples percentage; n^2 and %² head the columns for the not completed sample number and the not completed sample percentage.

males ($n = 2$); among the *consented* nurses, males accounted for 7.69%. All *completed* nurses, who responded to the question ($n = 25$), identified themselves as U.S. natives. Twelve *completed* nurses or 42.90% earned a four-year Bachelor-of-Arts (BA) degree rather than a two-year Associate-of-Arts (AA) degree.

Not completed nurse sample. Sixteen of 44 nurses were designated as *not completed*; this category comprised 36.37% of the possible sample. On the gender and citizenship items, the *not completed* sample registered within three percentage points of the *completed* sample. The greatest difference between the samples was in the higher education section: in the *not completed* sample only three nurses (18.80%) identified their highest degree was a BA.

In Table 4, the researcher reports the *not completed* nurse sample age mean (44.18) and standard deviation (7.76) and the incompleteness of the age items by five nurses.

Statistical comparisons of the nurse samples. To determine if the nurse samples were significantly different, the researcher performed the appropriate statistical test, either chi-square or independent samples *t* test, on the demographic variables. As recorded in the last column of Table 3, the tests with one exception confirmed that the samples were not statistically different. The *completed* sample nurses scored significantly

Table 4The Means and Standard Deviations of the Nurse Ages

	<i>Completed</i>	<i>Not Completed</i>	
	<i>Statistical Test</i>	<i>Statistical Test</i>	
	(<i>n</i> = 28)	(<i>n</i> = 16)	
<i>Mean</i>	45.08	44.18	$t(35) = -.232, p < .05$
<i>SD</i>	± 11.71	± 7.76	
Did not complete age question	2	5	
Completed age question	26	11	

higher on the item which asked to for the highest degree attained: $\chi^2(df = 2) = 7.035$, $p = .030$.

The Collaborative Practice Scale Nurse Scores

The CPS nurse scale was administered three times: pre-SBAR implementation, one-month post-commencement of SBAR implementation, and four months post-commencement of SBAR implementation. The participants responded to the nine items with a six-point Likert-type scale (*never to always*).

Descriptive statistics of the CPS nurse composite scores. The highest possible score on the nurse CPS scale is 54. Higher scores indicate increased collaboration. Only the scores of the *completed* nurse sample ($n = 28$) were included in the descriptive and inferential statistical analyses. Table 5 displays the successive mean total score increase. The Time 3 mean represented a score of 71.15% of the possible score of 54.

Descriptive statistics of the CPS nurse subscale scores. The CPS scale for nurses is comprised of two subscales with nine items: (a) Nurse Subscale 1: the direct assertion of professional expertise/opinion and (b) Nurse Subscale 2: active clarification of mutual responsibilities (Weiss & Davis, 1985). On the CPS nurse scale, Nurse Subscale 1 has a possible score of 24; Nurse Subscale 2 has a possible score of 30.

The scores for Nurse Subscale 1, presented in Table 6, demonstrate an increasing mean on each subsequent administration. The Time 3 mean represented a score of 83.92% of the possible score of 24.

The Nurse Sub scale 2 mean scores increased. The Time 3 mean represented a score of 62.03% of the possible score of 30.

Table 5CPS Composite Score Means and Standard Deviations for the Three Administrations

Statistics Level	Time 1	Time 2	Time 3
	Pre-SBAR	1-Month Post-SBAR	4 Months Post-SBAR
<i>Mean</i>	33.07	36.29	38.75
<i>Standard Deviation</i>	±10.26	±8.81	± 7.40

Table 6Means and Standard Deviations for NurseSubscale 1

Statistics Level	Time 1	Time 2	Time 3
	Pre-SBAR	1-Month Post-SBAR	4 Months Post-SBAR
<i>Mean</i>	17.68	19.29	20.14
<i>Standard Deviation</i>	±4.58	±3.83	±3.23

Table 7

Means and Standard Deviations for Nurse Subscale 2

Statistics Level	Time 1	Time 2	Time 3
	Pre-SBAR	1-Month Post-SBAR	4-Months Post-SBAR
<i>Mean</i>	15.39	17	18.61
<i>Standard Deviation</i>	±6.61	±5.59	±5.27

Inferential Statistical Analysis of the CPS Nurse Scores

The independent variable was time: Time 1, pre-SBAR; Time 2, one-month post-SBAR implementation; and Time 3, four months post-implementation. The dependent variables were the composite scores.

Analysis of the CPS nurse composite scores. The researcher used a repeated measures analysis of variance (ANOVA) to address RQ1. Table 8 presents the ANOVA for the nurse CPS composite scores. This table indicates a significant change in the nurse CPS composite scores over time. Post hoc comparisons (Figure 5) indicate that the score at Time 1 was significantly less than the score at Time 3. The score at Time 2 was not significantly different than the score at either Time 1 or Time 3. This finding is presented in Table 9:

Table 8Results of Nurse CPS Composite Scores ANOVA

Source	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Sig</i>
Time	2	451.45	451.45	9.66	.00
Error	27	1262.05	46.73		

Table 9Identification of Significant Effects in Nurse CPS Composite Scores

Time 1	Time 2	Time 3
33.07 ± 1.98	36.29 ± 1.98	38.75 ± 1.98

Note: Means not connected by a continuous line are significantly different ($p < .05$).

Inferential Statistical Analysis of the CPS Nurse Subscale Scores

The researcher also conducted repeated measures ANOVAs on each of the subscales of the CPS nurse scale: (a) Nurse Subscale 1: the direct assertion of professional expertise/opinion and (b) Nurse Subscale 2: active clarification of mutual

responsibilities. The repeated measures ANOVA identified a significant effect: $F(1, 27) = 12.24, p = .00$. The Nurse Subscale 1 scores, which were statistically significant, are presented in Table 10. Post hoc comparisons of the Subscale 1 scores identified a significant effect occurred between Time 1 and Time 3, as depicted in Table 11. Unconnected lines between Time 1 and Time 3 identify a significant effect.

Table 10

Results of Nurse Subscale 1 ANOVA

Source	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Sig</i>
Time	2	85.02	85.02	12.24	.00
Error	27	187.48	6.94		

Table 11

Identification of Significant Effects in Nurse Subscale 1

Statistics	Time 1	Time 2	Time 3
Means and Standard Errors	17.68 ±.88	19.29 ±.74	20.14 ±.62

Note: Means not connected by a continuous line are significantly different ($p < .05$).

The repeated measures ANOVA conducted on Nurse Subscale 2: the active clarification of mutual responsibilities, showed a significant time effect in the overall model $F(1, 27) = 6.16, p = .02$. The Bonferroni post hoc test comparison failed to identify significant differences between any two means. Based upon the overall model, the two means with the greatest difference were considered statistically different: The greatest difference in the means, which was 3.214, occurred between Time 1 and Time 3. Unconnected lines between Time 1 and Time 3 in Table 11 identify a significant effect.

Table 12
Results of Nurse Subscale 2-ANOVA

Source	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Sig</i>
Time	2	144.641	144.64	6.16	.02
Error	27	634.36	23.50		

Table 13

Identification of Significant Effects in Nurse Subscale 2

	Time 1	Time 2	Time 3
Mean and SE	15.39 ± 1.27	17.00 ± 1.08	18.61 ± 1.02

Note: Means not connected by a continuous line are significantly different ($p < .05$).

The analyses of the CPS nurse composite and subscale scores demonstrate the same pattern: a significant effect between Time 1 and Time 3.

Physicians

Sample Demographics

Physicians who responded to at least one survey set were identified as *consented* ($n = 40$). The *consented* physician sample had two data subsets: (a) *completed* physician sample, comprised of physicians who responded to all three administrations; (b) *not completed* physician sample, comprised of those who completed at least one survey but did not complete all three surveys. The samples demographics are presented in Table 12.

Completed physician sample. The *completed* sample ($n = 30$) was 69.80% of the possible sample. The researcher deemed the following demographic statistics noteworthy: (a) 66.67% of the *completed* physicians were affiliated with the Internal Medicine Department; (b) 56.67% of the *completed* sample practiced in subspecialties, (c) 46.67% of the *completed* sample physicians were U.S. natives, and 43.33% of the *completed* physicians were U.S. naturalized.

Not completed physician sample. The *not completed* physician sample demographics contrasted with items of the *completed* sample: (a) 90% of *not completed* physicians were affiliated with the Internal Medicine Department; (b) 70% of the *not completed* physicians practiced in subspecialties; and (c) U.S. naturalized physicians comprised 90% of the *not completed* sample. The sample demographics are presented in Table 12.

The mean age of physicians who *did not complete* sample was $56.10^{SD \pm 7.98}$. The mean age of the physician *completed* sample was $51.67^{SD \pm 11.27}$. Table 13 displays the mean age of both samples.

Table 14**Demographic Data for Physicians Who Completed ($n = 30$) and Did Not Complete ($n = 10$)**

Variable	Completed ($n = 30$)		Not Completed ($n = 10$)		Statistical Tests
	n^1	% ¹	n^2	% ²	
Gender					$\chi^2(df = 1) = .120, p = .72$
Female	2	6.67%	1	10%	
Male	28	93.33%	9	90%	
Medical Department					$\chi^2(df = 2) = 2.156, p = .34$
Anesthesia					
Family Medicine (FM)	2	6.70%	0	0%	
Internal Medicine	20	66.70%	9	90%	
Surgery	8	26.70%	1	10%	
Board certified in FM, IM, or Surgery	26	86.70%	8	80%	$\chi^2(df = 1) = .261, p = .61$
Not board certified in FM, IM, or Surgery	4	13.30%	2	20%	
Practice in Subspecialties	2	6.67%			
Do not practice in subspecialties	20	66.67%			
Subspecialties	8	26.67%			

(table continues)

Table 14 (continued)

Hematology (5);
Vascular Surgery (2);
Cardiology (6);
Pulmonology (2);
Gastroenterology (2);
Neurology (1);
Nephrology (2);
Bariatric Surgery (1); Ear,
Nose, and Throat and Plastic
Surgery (1);
Endocrinology (1);
Psychiatry (1);
Epileptology (1);
Geriatrics (1)

Hematology (3); Vascular
Surgery (2); Cardiology (3);
Pulmonology (2);
Gastroenterology (2);
Neurology (1); Nephrology (1);
Bariatric Surgery (1);
Ear, Nose, and Throat and
Plastic Surgery (1);
Endocrinology (1)

No Board Certification in Subspecialties	16	53.30%	3	30%	$\chi^2(df=1) = 1.637, p = .20$
Board Certified in Subspecialties	14	46.70%	7	70%	
Citizenship Status					$\chi^2(df=3) = 4.254, p .24$
U.S. native	14	46.67%	2	20%	
U.S. naturalized	13	43.33%	8	80%	
Foreign national	2	6.67%	0	0%	
Legal resident	1	3.3%	0	0%	

Note: n^1 heads the column identifying the completed sample number; $\%^1$ heads the column identifying the completed samples percentage; n^2 and $\%^2$ head the columns for the not completed sample number and the not completed sample percentage.

Table 15The Means and Standard Deviations of the Physician Ages

Statistics	Completed (<i>n</i> =30)	Not Completed (<i>n</i> =10)	
<i>M</i>	51.67	56.10	<i>t</i> (38) = .259
<i>SD</i>	±11.27	±7.98	
Completed age question	30	8	

Statistical comparisons of the physician samples. To determine if the physician samples were significantly different, the researcher performed the appropriate statistical test, either chi-square or independent *t* test, on the demographic variables. As recorded in the last column of Tables 12 and 13, the tests confirmed that the samples were not statistically different.

Descriptive statistics of the CPS physician composite scores. The total highest possible score on the CPS physician scale is 60. Physicians responded to the 10 items with a six-point Likert-type scale (*never to always*) (Weiss & Davis, 1985). Higher scores indicated increased collaboration. Only the scores of *completed* physicians (*n* = 30) were included in the descriptive and statistical analyses. The score pattern shown in Table 16 in which the Time 2 mean decreased contrasted with the nurse composite scores, which increased with each subsequent data collection point.

Table 17 displays the successive mean total score increase. The Time 3 mean represented a score of 76.67 % of the possible score of 60.

Table 16

CPS Physician Composite Score Means and Standard Deviations for the Three Administrations

Statistics	Time 1	Time 2	Time 3
	Pre-SBAR	1-Month Post SBAR	4 Months Post-SBAR
<i>Mean</i>	44.80	44.13	46.00
<i>Standard Deviation</i>	± 9.29	± 9.64	±8.83

Descriptive statistics of the CPS physician subscale scores. The CPS physician scale is comprised of two subscales with ten items: (a) the Physician Subscale 1: consensus development with nurses and (b) Physician Subscale 2: acknowledgment of the nurse’s contribution to patient (Weiss & Davis, 1985).

The scores for the Physician Subscale 1 are presented in Table 1. Thirty is the highest possible score for Physician Subscale 1.

Table 17Means and Standard Deviations for Physician Subscale 1

	Time 1	Time 2	Time 3
	Pre-SBAR	1-Month Post-SBAR	4 Months Post-SBAR
<i>Mean</i>	21.97	22.03	23.43
<i>Standard Deviation</i>	±4.67	±5.17	± 4.73

The Physician Subscale 1 mean scores increased with each administration; the measure is the CPS physician measure with the same increasing pattern as the nurses on all their CPS measures. The Time 3 mean represented a score of 78.10% of the possible score of 30.

Table 18Means and Standard Deviations for Physician Subscale 2

Statistics	Time 1	Time 2	Time 3
	Pre-SBAR	1-Month Post-SBAR	4 Months Post-SBAR
<i>Mean</i>	22.83	22.10	22.57
<i>Standard Deviation</i>	±4.96	± 4.79	± 4.46

Physician Subscale 2 Time 1 mean was the highest of the three means. The Time 3 mean was 75.23% of the possible score.

Inferential Statistical Analysis of the CPS Physician Scores

The independent variable was time: Time 1, pre SBAR; Time 2, one month post SBAR implementation; and Time 3, four months post implementation. The dependent variables were the composite and subscale scores of *completed* nurses and *completed* physicians.

Analysis of the CPS physician composite scores. The significant effects detected by these RM-ANOVA statistics were further addressed by Bonferoni post hoc comparisons of the means at the data collection points.

Table 19 presents the RM-ANOVA for the physician CPS composite scores. Neither Table 19 nor 20 identified that any significant effects occurred.

Table 19

ANOVA of Physician CPS Composite Scores

Source	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Sig</i>
<i>Time</i>	2	21.60	21.60	.94	.34
<i>Error</i>	29	664.40	22.91		

Table 20No Significant Effects Identified in CPS Physician Composite Scores

	Time 1	Time 2	Time 3
<i>Means and Standard Errors</i>	44.80 ± 9.29	44.13 ± 9.64	46 ± 8.83

Note: Means not connected by a continuous line are significantly different ($p < .05$).

Analysis of the CPS physician subscale scores. The researcher also conducted repeated measures ANOVAs on each of the physician subscales: (a) Physician Subscale 1: consensus development with nurses and (b) Physician Subscale 2: acknowledgment of the nurse's contribution to patient care (Weiss & Davis, 1985). The Subscale 1 scores are presented in Table 21. The repeated measures ANOVA identified no significant effect, as depicted in Table 22 with the continuous line linking all means that no significant effect occurred.

Table 21ANOVA of Physician Subscale 1

Source	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Sig</i>
Time	2	35.27	32.27	4.05	.05
Error	29	230.73	7.96		

Table 22Physician Subscale 1 Results Identified No Significant Effects

	Time 1	Time 2	Time 3
Mean			
and	21.97 ± 4.67	22.03 ± 5.17	22.43 ± 4.73
SE			

Note: Means not connected by a continuous line are significantly different ($p < .05$).

The Subscale 2 ANOVA results featured in Tables 23 and 24 did not identify a significant effect between any of the data collection times.

Table 23ANOVA of Physician— Subscale 2

Source	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Sig</i>
Time	2	1.07	1.07	.16	.69
Error	29	189.93	6.55		

Table 24

Physician Subscale 2 Results Identified No Significant Effect

	Time 1	Time 2	Time 3
Mean	22.83 ± 4.96	22.10 ± 4.79	22.57 ± 4.46
and SE	_____		

Note: Means not connected by a continuous line are significantly different ($p < .05$).

Q2: Did the Implementation of SBAR, Used in the ICU as Nurses Reported Patient Changes and Needs to Physicians, Result in Improved Communication Elements of (a) Openness, (b) Accuracy, and (c) Understanding between the Unit Physicians and Nurses as Measured by Selected Scales of The ICU Nurse-Physician Questionnaire?

To address this research question, the researcher performed three two-way repeated measures analyses of variance (RM ANOVA). The statistical analysis was performed on The ICU Nurse-Physician Questionnaire nurse and physician selected communication scale scores for each of the elements of openness, accuracy and understanding. The independent variables were time and profession with two levels of nurses ($n = 28$) or physicians ($n = 30$); the dependent variable was one of the elements scores of openness, accuracy or understanding. The independent variable

time of data collection period had three levels (a) Time 1, pre-SBAR implementation; (b) Time 2, one-month post SBAR implementation; and (c) Time 3, four months post SBAR implementation. The instrument was administered with the same administration processes as CPS, described in RQ1.

The ANOVAs performed on the three communication elements of openness, accuracy, and understanding, identified a significant difference in profession on the openness element. Post hoc comparison between the physicians and nurses at the three data collection points indicated at Time 1: The physicians scored significantly higher than the nurses on the openness element. A significant difference between professions was not noted at any other time. The statistic identified no effect of time or time interaction. No significant effects were identified in the element of accuracy.

In the understanding element, significant differences were identified in both profession and time. This statistic identifies a significant effect of time and time by professional group interaction. Post hoc comparisons identified a significant nurse effect between Time 1 and Time 2 and between Time 1 and Time 3. No significant time effect was identified for the physicians.

A significant professional group effect was present at Time 1 in the understanding element but was not present at Time 2 or Time 3. Post hoc analysis at Time 1 identified that physician and nurse scores were significantly different at Time 1 but were not significantly different at Time 2 or Time 3. Within each of the three elements, the researcher considers the descriptive statistics and the inferential statistics.

Samples

The data used in the RQ2 analysis were from *completed* nurses and *completed* physicians. *Completed* nurses and physicians responded to The ICU Physician-Nurse Questionnaire surveys during all three data collection times.

Nurse Sample

While 44 ICU nurses were invited to complete the surveys, 28 nurses *completed* all three surveys; this *completed* category comprised 63.64% of the possible nurse sample. The nurse sample ($n = 28$) and its demographics are described above in the RQ1 section.

Physician Sample

Forty-three physicians met the ICU admission criteria and were invited to complete The ICU Physician-Nurse Questionnaire at three data collection times. Thirty physicians, who comprised the *completed* physician sample, responded to all three administrations. The *completed* sample ($n = 30$) was 69.80% of the possible sample. The physician sample ($n = 30$) and its demographics are described in the RQ1 section.

Samples Comparison

Because the professions (nurses and physicians) comprised the independent variable in RQ2, the researcher completed chi-square tests and independent samples t tests to compare the demographic variables shared by the *completed* physician ($n = 30$) and *completed* nurse ($n = 28$) samples and to identify significant differences in the two samples. The samples were identified to be significantly different on a number of

variables: (a) citizenship status $\chi^2(5, N = 58) = 58.00, p = .00$; and age, $t(54) = -2.14, p = .04$. Age was not considered as a covariate because two nurses did not complete the age item. Even though a significant difference existed in citizenship status, the variable was not considered a covariate because the relatively small diverse physician sample ($n = 30$) was distributed among six categories. All nurses ($n = 28$) identified as U. S. natives.

The ICU Physician-Nurse Questionnaire Between-group Communication

Elements of Openness, Accuracy, and Understanding

Communication Element of Openness

The openness scale, which assessed by four Likert-type items, was defined as the extent to which nurses and physicians could express what they meant without fear of negative reactions or conflict (Appendix K includes the Between-group Communication Scales and Component Questions of the ICU Physician-Nurse Questionnaire.) The respondent evaluated all openness scale items on a five-point Likert-type scale (*Strongly Disagree* to *Strongly Agree*). The highest possible score of the openness scale was 20.

Descriptive statistics. As shown in Table 25, the nurse openness scores increased by approximately .30 with every subsequent administration. Conversely, the physician openness scores followed a different pattern: the Time 2 mean was less than Time 1; Time 3 mean was greater than Time 2. In each comparison, the physician mean was greater than the corresponding nurse mean by approximately two and one-half to three points.

Table 25Means and Standard Deviations for ICU Questionnaire Element of Openness

	Time 1	Time 2	Time 3
	Pre-SBAR	1-Month Post-SBAR	4-Months Post-SBAR
<i>Means of Nurse</i>			
<i>Scores</i>	14.39	14.68	14.93
<i>Standard Deviations</i>			
<i>of Nurse Scores</i>	± 3.11	± 2.59	± 2.55
<i>Means of Physician</i>			
<i>Scores</i>	17.43	17.00	17.33
<i>Standard Deviations</i>			
<i>of Physician Scores</i>	±1.72	±1.49	± 2.15

Inferential statistics. Table 26 presents the 2-way repeated measures ANOVA statistics comparing the element of openness between the nurses and physicians over the three data collection times. This statistic indicates no effect of Time or Time by Group interaction. The main effect of group was significant. Post hoc comparison

between the physicians and nurses at the three data collection points indicated that the physicians scored significantly higher than the nurses at Time 1. The two groups were not significantly different on the variable of openness at Time 2 or Time 3. Table 27 depicts with no connecting lines at Time 1 between the means a significant difference in profession.

Table 26

Two-way ANOVA Results for ICU Questionnaire Element of Openness

<u>Source</u>	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Sig.</i>
Time	2	1.38	1.38	.56	.46
Group x Time	1	2.93	2.93	1.18	.28
Error	56	138.83	2.48		
Group	1	291.21	291.21	24.79	.00
Error	56	657.79	11.75		

Table 27**Element of Openness Results Identified a Significant Effect**

Profession	Time 1 $M \pm SE$	Time 2 $M \pm SE$	Time 3 $M \pm SE$
Nurses	14.39 \pm .48	14.68 \pm .40	14.92 \pm .45
Physicians	17.43 \pm .46	17.00 \pm .39	17.33 \pm .43

Note: Means not connected by a continuous line are significantly different ($p < .05$).

Communication Element of Accuracy

The accuracy scale, consisting of three items, measured the degree to which nurses and physicians trusted the correctness of the information given to them by the other party (Appendix K includes the Between-group Communication Scales and Component Questions of The ICU Physician-Nurse Questionnaire). Each item on the scale used a five-point Likert-type scale (*Strongly Disagree to Strongly Agree*). The highest possible score on the openness scale was 15.

Descriptive statistics. As presented in Table 28, the means of both nurses and physicians followed nearly the same pattern: in addition to an identical score in first administration, the nurses and physicians either increased or remained constant with each subsequent administration.

Table 28**Nurse Means and Standard Deviations for ICU Questionnaire Element of Accuracy**

Statistics	Time 1	Time 2	Time 3
<i>Means of Nurse Scores</i>	9.93	10.11	10.11
<i>Standard Deviations of Nurse Scores</i>	±2.33	±1.90	±2.65
<i>Means of Physician Scores</i>	9.93	10.50	10.63
<i>Standard Deviations of Physician Scores</i>	±2.56	±2.47	±2.53

Inferential statistics. The two-way repeated measures ANOVA of the accuracy scores did not identify any significant effects by time or profession. These results are shown in Table 29 and Table 30, which shows no unconnected means.

Table 29**Two-way ANOVA Results for ICU Questionnaire Communication Element of Accuracy**

<u>Source</u>	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Sig.</i>
Time	2	5.59	5.59	2.69	.11
Group x Time	1	1.97	1.97	.95	.33
Error	56	116.20	2.08		
Group	1	4.12	4.12	.30	.59
Error	56	779.10	13.91		

Table 30**Element of Accuracy Results Did Not Identify Significant Effects**

Professions	Time 1 $M \pm SE$	Time 2 $M \pm SE$	Time 3 $M \pm SE$
Nurses	9.93 \pm .47	10.11 \pm .42	10.11 \pm .49
Physicians	9.93 \pm .45	10.50 \pm .41	10.63 \pm .48

Note: Means unconnected by a continuous line are significantly different ($p < .05$).

Communication Element of Understanding

The understanding scale, assessed by an eight items scale, measured the degree to which nurses and physicians believed that the communication with each other was comprehensive and effective (Appendix K includes the Between-group Communication Scales and Component Questions of The ICU Physician-Nurse Questionnaire). This scale used a five-point Likert-type scale (*Strongly Disagree* to *Strongly Agree*). The highest possible score was 40.

Descriptive statistics. Both nurse and physician understanding scores, displayed in Table 13, increased with each successive administration. At Time 1 the physician mean was 5.87 higher than the nurse mean; at Time 2 the physician mean

was 4.29 higher than the nurse mean; and at Time 3 the physician mean was 4.42 higher than the nurse mean.

Table 31

Means and Standard Deviations for ICU Questionnaire Element of Understanding

Statistics	Time 1	Time 2	Time 3
	Pre-SBAR	1-Month Post-SBAR	4-Months Post-SBAR
<i>Mean on Nurse Scores</i>	23.46	25.68	26.71
<i>Standard Deviation of Nurse Scores</i>	±5.01	±3.73	±4.36
<i>Mean on Physician Scores</i>	29.33	29.97	31.13
<i>Standard Deviation of Physician Scores</i>	±4.10	±3.51	±4.24

Inferential statistics. Table 32 presents the 2-way ANOVA statistics comparing the element of understanding between the nurses and physicians over the three data collection times. This statistic identified a significant effect of time by professional group interaction. Post hoc comparisons identified a significant effect for

nurses between Time 1 and Time 2 and between Time 1 and Time 3. No significant time effects were present for the physicians.

A significant professional group effect was present at Time 1 but was not present at Time 2 or Time 3. Post hoc analysis at Time 1 identified that physician and nurse scores were significantly different at Time 1 but were not significantly different at Time 2 or Time 3. Table 33 displays significant effects.

Table 32

Two-way ANOVA Results for ICU Questionnaire Communication Element of Understanding

<u>Source</u>	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Sig.</i>
Time	2	184.67	184.67	19.37	.00
Group x Time	1	15.23	15.23	1.60	.21
Error	56	534.03	9.54		
Group	1	1025.70	1025.70	27.07	.00
Error	56	2121.60	37.89		

Table 33

Identification of Significant Effects in the Element of Understanding

Profession	Time 1 $M \pm SE$	Time 2 $M \pm SE$	Time 3 $M \pm SE$
Nurses	23.47 \pm .87	25.68 \pm .69	26.714 \pm .82
Physicians	29.33 \pm .84	29.97 \pm .67	31.13 \pm .79

Note: Means not connected by a continuous line are significantly different ($p < .05$).

RQ3: What Were the Nurse and Physician Attitudes toward Collaboration and Communication Regarding SBAR Implementation as Measured by Interviews?

The four protocol nurse and corresponding physician questions denoted in parenthesis included these elements: (a) a description of a professional relationship with a physician/nurse that he or she considered collaborative and successful and the effects of the relationship on patient care; (b) a description of how SBAR adoption had affected communication or relationships with the physicians/nurses and patients, including understanding and openness that occurs between the interviewee and physicians/nurses, the enjoyment of talking with physicians, and (for physicians, the accuracy of information) and the timeliness of information; (c) a description of attitudes toward and experiences with making (for physicians receiving) the

Recommendation Phase of SBAR and the phrasing of SBAR; and (d) a description of the attitudes, including peer remarks and stories, toward SBAR and its implementation. The researcher presents the data by repeating the question, establishes categories of themes, followed by subcategories.

Nurse Attitudes toward Collaboration and Communication

Regarding SBAR Implementation

For clarity the researcher repeated and italicized each of the questions from the interview protocol (Appendix G).

The reader may refer to Appendix N for an outline of the configuration of nurse data categories and subcategories. Each subcategory description is explicated by one quotation and one paraphrased nurse comment. Relevant data from nurse Collaborative Practice Scales (CPS-N) (Weiss & Davis, 1985) and The ICU Nurse-Physician Questionnaire (ICU-N-P) (Shortell, Rousseau, Gillies, Devers, & Simons, 1991) are included.

IPI(a). Please Describe a Professional Relationship with a Physician That You Considered Collaborative and Successful. Please Comment on the Relevancy, Their Importance, and Appropriateness of the Following Actions To Your Story of Collaborative Nurse/Physician Care of the Patient: (a) Telling Physicians When Their Orders Seem Inappropriate (CPS-N, 7); (b) Suggest To Physicians Approaches To Patient Care That I Think Are Useful (CPS-N, 5); (c) Telling Physicians My Assessment of Difficulties Related To a Patient's Ability To Deal with a Treatment

Option and Its Consequences (CPS-N, 8); or (d) Telling a Physician That My Area of Professional Expertise Is Greater Than He Thinks It Is (CPS-N, 3).

The data were analyzed into three categories in addressing question 1a: (a) physician communication strategies (5 subcategories), (b) physician practices (4 subcategories), and (c) physician behaviors affirming nurse collegial role (3 subcategories).

Physician communication strategies. The first category identified five communication strategies used by collaborative physicians to communicate respect. The strategies included communication through nonverbal methods of listening intently and making eye contact and more explicit strategies of greeting nurses, explaining well, and positively reinforcing nurses.

- a) created rapport upon entering the unit (RN4 and RN5). Some physicians, deemed not to be collaborative by some nurses, entered the unit, did not speak to anyone, and immediately began charting after locating the charts (RN5, Interview). Both RN4 and RN5 described the collaborative physician as greeting the nurses upon entering the unit. RN4 described an interchange in which the physician used humor which the nurse returned: “The success of the relationship is related to the rapport. When the physician walks on the unit, I am greeted and I greet him. . . . This particular physician has a habit of addressing the nurses, ‘Good morning, Dr.’ [whatever our first name happens to be]. I will say, ‘Good morning, Your Honor.’

- b) gave eye contact (RN3, and RN6). Two nurses experienced physician eye contact as establishing rapport and respect. For RN3, eye contact was an important element of active listening. She experienced this “eye-to-eye” communication as a physician indication of valuing nurse ideas and assessment. RN6, a young, recent graduate, also experienced affirmation when the physician used eye contact:

I think that face-to-face, one-on-one, the eye contact, is really helpful with physicians when they make that eye contact with you and you feel like they look you in the face and talk to you as a person or as an adult.

- c) listened well (RN3, RN7, RN8, and RN9). Nurses described physicians deemed collaborative as listening well and patiently when receiving patient information. RN3 elucidated both strategies of eye contact and listening:

When you sit down with them eye-to-eye and their whole attention is on your talking, not looking at the patient or doing an assessment while you are talking. They will actually stop and listen The attention is focused solely on what is being said about the patient for the report of that morning or whatever is going on.

- d) explained fully (RN3, RN9, RN10, and RN6). The collaborative physicians explicated medical conditions and answered questions in a non judgmental manner. RN3, RN9, and RN10 noted that these explanations included the rationales of the decisions. Parallel to the high listening standard, the collaborative physician, by attending to nurse needs, extended beyond the minimum:

They answer my questions well. They seem to really go into detail to explain it to me. If I don't understand, they seem to keep carrying on the conversation. They don't just give me an

answer and turn around and walk off. They usually will feed into what I am looking for. (RN6)

- e) gave positive reinforcement (RN5, and RN7). RN7 reported that the physician, deemed to be collaborative, complimented nurses when they had completed important actions. RN5 added that physicians sometimes thanked them: “Yes, and then also a lot of times, you know, he will often . . . he will thank us. You know—“Thanks for your hard work; thanks for your help.””

Physician practices. The second category, physician practices, described processes by which the collaborative physicians organized nurse interactions with patient care. RNs reported that these approaches promoted collaboration. Three subcategories comprised the physician practices category: (a) visited patients at early, predictable times; (b) sat beside the nurse to review the chart and orders; and (c) explained patient orders rather than solely writing them; and (d) requested that the nurse accompany him on patient rounds.

- a) visited patients at early, predictable times (RN1 and RN2). Nurses submitted that constancy of physician practice patterns promoted collaboration. Because one collaborative physician customarily reported to the critical care unit very early, RN1 could plan for his visit. RN2 also affirmed the opportunity for nurse preparation afforded by early, predictable rounds: “There is a physician here that the nurses can actually predict his rounds. This is very helpful because the nurses can have all of his chart information ready for him including his laboratory data” (RN2,

Interview). Both RN1 and RN2 were day-shift nurses; night nurses often were not able to predict physician rounding times, following variation in office hours.

- b) reviewed the patient chart with the nurse sitting at his side (RN2, RN4, and RN6). While many physicians unaccompanied documented in the chart, RN4 apprised the physician of such important patient information as the patient's condition, medication, IV drip titration, or unaddressed issues during a RN/MD joint chart process.

RN2 also suggested that the physician behavior, by which he initiated the joint chart process, established a respectful, collegial atmosphere:

He sits down in the nurse's station. He pulls up a chair for himself as well as whomever he is speaking to, because he wants you to sit as well. Whether he is talking to a patient or a nurse, he will pull up a chair. He likes for you to see him write what he is writing.

- c) verbalized and explained patient orders rather than solely writing them (RN2, RN5, and RN10). This verbalization occurred after the physician had written the orders (RN5) or simultaneously as the physician wrote in the chart (RN2). He often asked her if she had input into the orders. In her interview, night-shift nurse RN10 concluded that during her daytime orientation collaboration existed due to joint nurse/ physician rounding and physician ordering practice: "because one particular physician would want you to walk into the room with them [*sic*]. . . . This particular physician would come out and talk to me while he was writing his orders and explain to me why he did his orders."

d) requested nurse accompaniment on patient rounds (RN2, RN4, RN7, and RN10). This practice, validated in the preceding RN10 quotation, paralleled the joint physician/nurse chart review process. RN 7 submitted that joint nurse/physician rounding “would most definitely” augment collaboration. Quite comfortable in joint rounding collaboration, RN4 reported adding detail that the physician did not address:

Another way of describing the success is we go into the patient’s room together and speak to the patient together at the same time. He speaks and I listen or if there is something to add, I will add it, if he did not cover it.

Physician behaviors affirming nurse collegial role. Physicians, who acted on nurse assessments and judgments, affirmed nurses as colleagues. The category had three subcategories: Physicians (a) professionally responded to nurse questions and telephone calls; (b) visited patient due to nurse request; (c) sought and valued nurse input related to patient care; and (d) accepted and valued their questioning of orders.

a) politely responded to nurse telephone calls and questions (RN1, RN3, RN4, RN5, RN6, and RN9). RN1 described a physician who always professionally received nurse calls during the day or night. Two of the six nurses described their comfort in telephoning the MD by the diction *safe*: “You feel safe to call him anytime and say this just does not look right and he is not going to say that is just ridiculous and you are stupid, don’t call” (RN3). Rather than addressing the collaborative response to a telephone call, RN9 recounted the antithetical response when a concerned nurse

called the physician at night and was rudely insulted because the physician was upset that he had been called.

- b) physician visited patient due to nurse request (RN3 and RN8). The physician, who reported to the hospital upon the nurse request, communicated a high confidence in nurse evaluation skills. RN8 described a physician, who acted upon her request to immediately visit a bleeding patient; she said that this action was “very important.” When a physician acted on the nurse recommendation, RN3 felt that she was a trusted colleague:

I could call him and say this does not look right and he would say, I will be right there. Instead of saying, I will get to it later. I am not saying all physicians should run right down, but he said I will be right there.

- c) sought and valued nurse input related to patient care (RN1, RN2 RN3, RN4, RN5, RN8, and RN9). This subcategory described instances when the collaborative physicians sought and responded positively to nurse clinical input. RN9 reported that she and other nurses were particularly gratified when a physician asked for their clinical opinions: “He actually asks your input; what you have seen, how you think this has healed or has progressed and he actually values your opinion.” RN5 and RN8 reported that physicians affirmed nurses as colleagues when the physicians, asking for input, used the image that the nurses were indispensable as their eyes: “‘Well, what do you think?’ And he says, ‘You are the one that can see the patient, I can’t see the patient, and I’m dependent upon your eyes to help me out when I am not here’” (RN5).

d) accepted and valued their questioning when orders seemed inappropriate (RN1, RN2, RN3, RN4, RN5, RN6, RN7, RN8, and RN9). The nurses were complimentary of the collaborative physician who accepted their questioning of an order. RN3 said that the collaborative physician used every question to educate. While RN4 could not remember a specific instance with the particular collaborative physician she trusted that she would give input that would be accepted well: “I would not hesitate to say this is what I am noticing and I am just afraid that they will not do well. I think that would be appropriate. In my experience, he would value and honor that.”

Data related to the Nurse Scale of the Collaborative Practice Scales (CPS-N) (Weiss & Davis, 1985) also supported the relevancy and importance of physician seeking and accepting nurse input. When interviewed, 7 or more of the 10 nurses reported that the following actions were relevant, important, and appropriate to their stories of collaborative nurse/physician care of the patient: (a) suggest to physicians approaches to patient care that I think are useful (CPS-N, 5); (b) telling physicians my assessment of difficulties related to a patient’s ability to deal with a treatment option and its consequences (CPS-N, 8).

While most nurses responded to the question *IPI(a)* in relationship to collaborative physician characteristics, several nurses (RN2, RN3, RN 7, RN9, and RN10) also talked about the “other” physicians described by RN2 as the “ones that you cannot approach at all.” RN9, mirrored most nurses’ strong beliefs about their

responsibilities in ensuring patient safety when she asserted that questioning an order was appropriate because it could mean “life or death for the patient.” RN9 questioned physician orders to ensure patient safety even though she was comfortable doing so “with very few physicians.” RN3 professed that if she questioned an order even if related to patient safety; many physicians “will go and scream at your boss; your boss will come out and say he is in there screaming.” RN9 told of physicians who discouraged through intimidation new nurses from calling at night with questions:

I think that newer nurses a lot of times—these doctors will try to intimidate them—I don’t want to say scare—but intimidate them to the point where they are scared to call them on anything and I think that is a shame because we’re all supposed to be doing this for the patient.

RN7 opined that most nurses had such problems with the same physicians whom she described:

If you ask for something like a breathing treatment they might not give it to you even though that seems to be what’s best for the patient. It is sometimes hard for us to understand that. Why they wouldn’t want what’s best for the patient? That does happen.

RN2 described nurse behaviors to deal with the “other” physicians who do not accept any of nursing ideas:

Now with the other physicians, there are some here who the nurses have to be manipulative to say what you think, because none of your ideas are accepted. These are the physicians that the nurses do not like. We, as nurses, like being part of a team. When a physician is not allowing you to do what you see has been proven through your practice. . . . In the back of your mind, you are a playing a little game and it is not fair to the patient or the family. The physician will sometimes treat us with disrespect.

IP(b). Please Describe the Effects of This Collaborative Relationship Upon Patient Care.

To address part (b) of question 1, which considered how a successful and collaborative professional relationship with a physician affected patient care, the interviewees made general conclusions and related specific stories of unnamed patients. Some patients died peacefully in the ICU, and others miraculously recovered. The researcher identified three categories: (a) collaboration contributed to positive end-of-life care; (b) ICU patients were taken off the ventilator more quickly; and (c) critically ill patients unexpectedly recovered.

Collaboration contributes to positive end-of-life care (RN1 and RN2).

Collaboration between physicians and nurses afforded terminally ill patients and their families coordinated information, support, and atmosphere in which to make difficult decisions regarding future care. RN1 submitted that the nurses and physicians did an excellent job through collaboration to provide an atmosphere for the family to make end-of-life decisions. RN2 recounted the story of an elderly man with terminal lung disease, who with his family struggled with the decision to accept or reject the ventilator. The physician and nurse worked as a team providing information, listening, and answering patient/family questions. Because of this collaborative process, the patient decided to cease curative treatment:

He had difficulty coming to terms with himself. When you see your loved ones crying around the bed and not wanting to let you go, it is very hard to not go on a ventilator or decide that it is the end, but he was able to be strong. As the afternoon has gone by, the family is happy in there and it is not that sad shadowy environment it has actually changed and he is relieved. You can almost see the relief on

the patient's face that is okay. It is okay from the family and if that is the way, just enjoy the time we have left. . . . [H]e was at peace with his decision to forego the ventilator.

ICU patients are taken off the ventilator more quickly (RN1, RN2, and RN4).

Ventilator care was necessary for many patients in the ICU. Removing patients from ventilator use was not only important for patient comfort but was also a variable in recovery. Both RN1 and RN4 submitted that patients were removed from the ventilator earlier through ongoing consultation between the nurses and physicians.

RN4 described such collaboration:

For example, a patient who is on a ventilator, the plan is to get them off the ventilator through the course of the day. If they are doing really well, very alert and everything is stable and blood gases are good, going ahead and calling the physician and stating that the patient really looks great and ask if he wants the tube out. I will relay the lab work and say, "This is what I am seeing." He in turn will say "Go ahead and take him off the ventilator. "The benefit to the patient obviously is that they [*sic*] are lot more comfortable, and there were hours that did not have to be spent on a ventilator.

Critically ill patients unexpectedly recovered (RN3, RN7, RN8, and RN9).

When nurses credited patient recovery to nurse and physician collaboration, they exhibited professional pride and satisfaction. RN7 related that a physician rescheduled a heart catherization order for an earlier time, based on nurse assessment. The heart catherization showed that the patient needed an emergency coronary artery bypass graft.

RN3 recounted the physician/nurse exchanges which contributed to a miraculous patient outcome:

I had a patient, who had an abdominal wound, and she was diabetic and she was non-compliant. The surgeon was very interested in his patient and what was going on. She was not doing well, but . . . I could call him and say, "This does not look right" and he would say, "I will be

right there.” He came down and looked and said, “You were right.” Then I would call him later and say, “Her blood pressure is dropping. Do you want me to try blah, blah, blah?” He would say “Yes” or “No, let’s try that or go ahead and try that. Call me back and let me know.” . . . I felt really good about that patient, because she received total care—360 degrees. There was constant communication with the physician and the family, with the family and the physician, especially between nurse and doctor relationship. I could tell him anything, and he would come look at it, or he would give credence and check it out. . . . She should have never lived and she did. For her to have lived—here was a miracle. I think it was the constant attention she received when she needed it.

IP2. How Has the Adoption of SBAR Affected Your Communication or Relationships with the Physicians and Patients? How Has the Adoption of SBAR Affected (a) the Understanding That Occurs Between You and Physicians (ICU N-P Q, 6); (b) the Openness Between You and Physicians (ICU N-P Q, 3); (c) the Enjoyment of You Talking with Physicians (ICU N-P Q, 5,); and (d) the Timeliness of Information (ICU N-P Q, 10, 11, 12, and 13)?

The researcher investigated IP2 with the measurement of the ICU Nurse-Physician Questionnaire (ICU N-P Q). To discuss the effect of SBAR implementation on communication and collaboration, the researcher selected four questions from the ICU N-P Q-Nurse Scale. The researcher explicated each subcategory with the result summary, a paraphrased nurse comment, and a quotation.

Effect of SBAR on communication or relationships with physicians and patients. The nurses reported mixed experiences:

- a) report using SBAR was improved (RN1, RN2, RN7, RN6, and RN10).

These six nurses submitted that SBAR resulted in providing a more organized, focused and complete report to physicians. This competency reduced physician frustration with incomplete and poorly organized

information in emergent situations (RN 1 and RN2). According to RN6, lengthy telephone reports to physicians were avoided:

It makes me more focused when I talk to them on the phone. I do better talking to you face-to-face and remembering what I want than I do when I am talking into a phone. I know they are in a hurry and want to get off the phone and you want to be off the phone with them.

b) SBAR adoption brought no change (RN 3, RN 4, RN 5, and RN 9).

Several nurses, all of whom had more than five years nursing experience, declared that SBAR implementation had not affected their relationships because they were giving the required information prior to the SBAR implementation. RN5 explained:

For the most part—I know that the name SBAR has been put to it—but even in school we were taught that you introduce yourself, what you are calling for information and all that stuff so I think that the name has just been put with it.

c) SBAR produced positive change for the patient (RN7). Rather than

commenting on the SBAR as it related to physicians, only RN7 linked the SBAR implementation to nurses being more effective for the patient:

“When you use that, you get more positive responses . . . and you are going to be more positive for them [the patients].”

Understanding between the interviewee and physicians.

a) SBAR improved the understanding (RN2, RN7, RN4, RN8, and RN10).

Three nurses (RN4, RN7, and RN10) submitted that predictability of a report given with SBAR improved understanding. RN7 clarified: “I would say [yes] because they know what to expect from you and you know what

they expect. If you use the tool in that way, each side knows what to expect from the other one.”

- b) SBAR had no effect on nurse/physician understanding (RN3, RN6, and RN9). For various reasons, three nurses did not think that it had affected the understanding between nurses and physicians. Some felt that they were already giving this information before SBAR implementation. Two nurses (RNs 6 and 9) attested that not all the physicians wanted to listen to the patient detail explicit in the SBAR format; RN6 described the estimated sixty percent of physicians whom she encountered:

They just want to skip through telling you what they want to do next. You are not really sure they understand what you are calling for and asking for or if they really do know that patient. Sometimes they are quick to just go ahead and give an order and then be done with it.

Openness between the interviewee and physicians.

- a) SBAR produced no change in openness (RN4, RN5, RN6, RN7, RN8, RN9, and RN10). Seven nurses submitted that that the openness between physicians and nurses had not changed since SBAR implementation. RN6 typified these responses: “I can't say it has made much of a difference. Just prior knowing the physicians, it has been about the same. I don't think they are any more open or closed than prior.”
- b) SBAR improved openness (RN1 and RN2). RN1 and RN2 agreed that openness had improved due in part to increased MD confidence in nurses:

When you have the information right there, the physicians know you are on top of it. So the confidence level from the physician in the nurses immediately goes up. Thus, the nurse gets what

the patient needs because you are not calling for silly things.
(RN2)

Enjoyment of talking with physicians.

- a) SBAR did not change nurse enjoyment of talking with physicians (RN1, RN3, RN4, RN5, RN8, RN9, and RN10). Several interviewed nurses described no difference in their enjoyment of talking to physicians related to SBAR implementation. RN10 posited that she did not enjoy talking to any physician at any time; RN3 contextualized the refutation:

There are very few that I actually enjoy talking to. Mainly, because they are busy and want out. Most of them are fine, but some are a little bit more closed off. I think it is the older ones versus the newer ones. You have some physicians that will say, thank you for your help, I really appreciate you doing that. However, that is only one.

- b) SBAR increased the enjoyment of talking with physicians (RN2, RN6, and RN7). Three nurses declared that SBAR had made talking with the physicians more enjoyable in that the more confident nurses knew specifically what they should report. RN7 determined that the increased comfort derived from each group knowing what to expect from the other group. RN2 mentioned the SBAR structured template, RN6 stated: “I think it has made it easier talking because . . . before, that structure of making sure I feel like I know what I want. I think they enjoy when you are more together talking to them on the phone.”

Timeliness of information. SBAR increased timeliness (RN1, RN6, RN5, RN7, RN8, and RN10). The majority of nurses agreed that the organizational skills prompted by the SBAR outline template ensured that nurses would not call the physicians until they had assembled and organized all data to report. This preparation

facilitated the nurse giving a succinct but complete report and prevented repeat calls; RN6 emphatically declared that she wanted to call a physician only one time at 3:00 in the morning. RN10 discussed the timeliness of a complete SBAR report:

I think it is better. If you get it out and said, it is done and it happens a lot quicker. I think that if you do not go by that, you really do not have a basis and you are on the phone and they are asking all these questions and you have to say, let me check the chart. If you have your assessment right there, it goes by a lot quicker.

IP3. From a Nurse's Point of View, What Are Your Feelings About Making the Recommendation Phase of SBAR To a Physician? What Experiences Have You Had With Physicians When You Have Made the Recommendation? How Have You Phrased the Recommendation?

The researcher presented the data in 6 levels, explicated by nurse paraphrases and quotations.

Nurse phrasing of Recommendation. When teaching SBAR use to the ICU nurses, Community Hospital leaders instructed the nurses to give the recommendation as a statement (Leonard et al., 2004). The *Recommendation* statement, which was taught, modeled and coached, was not presented as a choice. Four months following SBAR implementation, the majority of the nurses reported that they phrased the *Recommendation* as a question; two employed a tentative statement.

a) phrased as a question (RN1, RN2, RN3, RN4, RN5, RN7, RN8, and RN9).

The nurses reported four reasons for phrasing the *Recommendation* as a question: (a) RN4 reported that because she usually needed a medical judgment when she called, she would never use the verbiage “I recommend”; (b) RN3 said that to satisfy older physician attitudes and

egos, she used a question to make the physician “think it was his idea”;

(c) RN8 said made a statement in an emergency but that she usually phrased the *Recommendation* because she doesn’t want to seem “pushy” or as if she was questioning “his abilities”; and (d) RN7 agreed with the reasoning of RN3 that a question produced a better outcome for the nurse:

Well, maybe it is a power issue. I don’t really know. I’ve just learned over time through experience that when you ask, if you put it in a form of a question, you’re more likely to get what you want than if you say they need this. I don’t know why.

Because a question was better accepted, RN7 suggested that the *Recommendation* statement be reformatted and adopted as a question.

b) phrased tentatively (RN 6 and RN10). Both nurses, who were relatively new nurses, made the *Recommendation*, followed by a question of “What do you think or suggest?” RN6 illustrated her *Recommendation* style:

I usually say after assessing the patient, “I think possibly Lasix may be a good order if you'd be okay with that” or “I think we may need a Beta blocker if you’re okay with that, if not, you know, these are still some of the things the patient is doing. What would you suggest?”

Nurse feelings toward and experiences of making the Recommendation. The nurses posited three positions related to this question: (a) *positive* because the protocol use organized the report; (b) *ambivalent* depending on the physician relationship; and (c) *negative* because most physicians did not want a *Recommendation*. Because each attitude group was comprised of inexperienced, experienced, day-shift, and night-shift nurses, the demographic variables did not appear to be related to the attitudes and behaviors.

- a) positive because the protocol use organized the report (RN1, RN6, RN7, and RN10). RN1, who reported that the physicians were open to the nurse *Recommendation*, was positive about using the *Recommendation* in an urgent situation. RN10 reported that “not one physician” had been upset with her when she made the *Recommendation*; she also described satisfaction that the *Recommendation* phase seemed to conclude her assessment. RN6, an inexperienced nurse, discussed the *Recommendation* with her nurse peers prior to the call. She submitted that this preparation contributed to her comfort and success:

Usually what I've offered to them, they have given me. Sometimes they have either added to or they have told me no we don't need to do this. Some will say, “Why we don't need this” because they think your patient is going to do well without it. They say, “Just give them some time.” Nine times out of ten most of them have been very helpful and very good with my suggestions.

- b) ambivalent depending on the physician relationship (RN5 and RN2). RN5 admitted that she would give the *Recommendation* to physicians with whom she had a collaborative relationship but that she would not make it with others whom she did not know well. With collaborative relationships, she reported that the *Recommendation* had been well received. In agreement with RN5, RN2 also emphasized the importance of knowing the personalities of the physician and adjusting the SBAR and *Recommendation* phrasing to get what she needed:

Some physicians are so close-minded to the nurse's roles, they will almost tell you to go away. They would rather you read

the progress note rather than discuss it with you. If we make a *Recommendation*, we have to actually do it in a way that it comes out as their thought, rather than our thought. Actually, on the telephone when the nurses are talking to them sometimes, there is a group of them that are so abrupt, they will hang up. So if you do not ask for something, they will hang up. Especially in critical care, we do not call, unless we need something. So we are there almost putting the need out before going through the SBAR. So you have to do the “R” first. You have to tell them what you need and why you need it.

- c) negative because most physicians did not want a *Recommendation* (RN9).

RN9 reported that most physicians neither wanted the *Recommendation* nor any portion of SBAR except the Assessment phase:

Most of them do not want to hear it. I am going to be quite blunt with you on that. I had one doctor tell me—well, I have had several tell me that—“Why did you call me?” They just want to get to the gist; they are not worried about why. You know, a lot of times it is one doctor covering for another; they don’t want all that background history. They want to know why you are calling me. . . . Those types don’t want a *Recommendation*.

IP4. As With Any Change, I Am Sure That You Have Made or Heard Remarks, Told or Heard Stories, or Heard or Had Conversations About SBAR and Its Implementation. Please Share Some of These To Help Us Understand More Fully the Attitudes Toward This Communication Tool.

Five categories described the attitudes: (a) experienced nurses did not accept the required SBAR template completion; (b) experienced nurses believed that they already practiced SBAR prior to the formal implementation; (c) nurses agreed that SBAR training and practice was excellent for inexperienced nurses; (d) many physicians did not want the SBAR detail; and (e) a physician coaching nurses with

SBAR was an effective change strategy. These data validated previous question responses.

Experienced nurses did not accept the required completion of the SBAR template (RN1, RN2, RN 3, RN4, RN5, and RN8). In the SBAR training, nurses were told to turn in the completed SBAR template to the unit manager. RN1 and RN2 explained that nurse resistance to SBAR was due in part to frustration with an additional form. RN3 described the negative attitude:

The comments that were made included “This is pain in the butt, do we have to do this again?” as well as “I am not filling out that form.” Really to a point, you already know what you are going to say before you call and like I said, I always write it down anyway. It did help. Other nurses have claimed that it helped after a while. The form was a pain in the beginning. It made more work for us.

Experienced nurses believed that they already practiced SBAR principles (RN1, RN2, RN3, RN4, and RN8). Nurses with more than 4 years nursing experience reported that they accepted SBAR when they realized that they had practiced similar communication prior to SBAR implementation. RN2 posited that the older nurses realized that SBAR was the process that they generally had developed. In the interview, RN1 described the experienced nurse SBAR adoption: “Once you see this and realize we are already doing this anyway which they are to a certain extent, some better than others, then it is okay.”

Nurses agreed that SBAR training and practice was excellent for inexperienced nurses (RN2, RN3, RN4, RN5, RN6, RN7, and RN9). The majority of interviewees endorsed SBAR training for new nurse graduates. RN6, a recent graduate, noted that SBAR had been valuable for her and other new nurses. RN5, a nurse with more than four years experience, was quite positive that SBAR would be

beneficial for the new nurse:

I think it's excellent I wish I had had this when I was a new nurse. Okay? You know, . . . when you are new and you are kind of uncomfortable anyway, you know. It's new people, it's new doctors, it's new everything. This definitely, to me, would have been great for me, and I think it is.

Many physicians did not want the SBAR detail (RN9 and RN10). Two nurses reported that many physicians did not want to hear the detail of the SBAR protocol. RN9 posited that the vast majority only wanted to hear detail concerning why the patient presented to the hospital. They did not want to know the other SBAR aspects.

In agreement, RN10 explicated this physician attitude:

I think the only thing I have heard from a physician is I do not really want to hear all that, go ahead and tell me what is going on. . . . About 25% of them do not want to hear the whole information.

One physician coached an inexperienced nurse (RN6). RN6 related that a physician asked for her report by the SBAR letters. She reported that his coaching motivated her to increase SBAR use:

I have had an experience with one that I think he has seemed to know about the situation and what we are doing. He has asked for those specific questions. . . . It kind of threw me for a loop whenever it happened. . . . It is just because with his particular patients when we do them so often, we kind of have to go through a whole step with him anyways to get that information. . . . It did shock me when I had a physician ask me. That kind of pulls you more to wanting to use it. If they are going to ask you for it, you'd better know it. . . . That makes me remember they are looking for this.

Physician Attitudes toward Collaboration and Communication Regarding SBAR

Implementation

For clarity the researcher repeated and italicized each of the questions from the interview protocol (Appendix H). The reader may refer to an outline of the

configuration of nurse data categories and subcategories(Appendix O). Each subcategory description is explicated by one quotation and one paraphrased nurse comment. Relevant data from Collaborative Practice Scales (CPS-P) and the ICU Nurse-Physician Questionnaire (ICU-N-P) are included.

IPI(a). Please Describe a Professional Relationship With a Nurse That You Considered Collaborative and Successful. Please Comment on the Relevancy, Their Importance, and Appropriateness of the Following Actions To Your Story of Collaborative Nurse/Physician Care of the Patient: (a) Coming to Consensus With Nurses on the Best Way To Approach Care for a Particular Patient? (CPS-P, 7); (b) Ask for Nurse Input into Treatment Plan Development (CPS-P, 4); (c) Ways To Strengthen the Patient's Support System (CPS-P, 2); or (d) Acknowledging To Nurses the Areas of Healthcare Where They Have More Expertise Than I Have (CPS-P, 9).

The data were analyzed into 3 categories and 11 subcategories in addressing question 1a: (a) nurse communication strategies (7subcategories), (b) nurse knowledge and competence (4 subcategories), and (c) nurse-physician rounding process.

Nurse communication strategies (MD1, MD2, MD3, MD4, MD5, MD6, MD7, MD8, MD9, and MD10). The first category identified five nurse communication strategies, which physicians believed contributed to collaboration. The strategies included: (a) reported in an organized manner; (b) listened well; (c) engaged in dialogue which questioned an order and gave input to treatment; and (d) advanced opinions and differences in an appropriate manner.

- a) reported in an organized manner (MD3, MD5, MD6, and MD7).

Physicians acknowledged nurses who had studied the chart, the medications, and patient trends and related this information in the rounding report were organized and prepared. MD3 emphasized the organization and integration of patient trends and various shift reports:

It is nice if I have a patient in the unit, post-operative or whatever, that if I come in, they come seek me out, they have a chart and clip-board and start to tell me what I need to know and what has happened over the last 12-24 hours. . . . It is nice to actually have the nurse complete the oral history—to hear this is what happened to the patient and this is what the night nurse found.

Physicians deemed that a prepared nurse who gave an effective report saved much time and focused them on patient issues. MD7 asserted that nurses also assisted in physician prioritizing through their excellence of “highlighting” certain important issues in the report.

- b) listened well to the physician (MD1, MD2, and MD6). Some physicians

noted that collaborative nurses listened well. MD2 asserted that nurses, who were interested in patients, sought out the respective physician and listened to his opinion. MD1 linked the listening to subsequent actions: “Being a good nurse is one that listens to you and implements what you have suggested as an order, as well as questions the same order that benefits the patient.”

- c) dialogued with the physician (MD2, MD7, MD8, MD9, and MD10).

Physicians maintained that collaborative nurses dialogued with them. MD2 described this conversation regarding symptoms or treatment as going

“back and forth” with its conclusion being an order or a treatment plan which the nurse accepted or questioned. MD8 emphasized the importance of this dialogue to patient care and collaboration:

You may not have to have an exact consensus to resolve whatever the patient care issue is. Certainly it is—you may have a give-and-take of ideas and you may come to a not his or her agreement or my agreement or my determination but somewhere in between, but that give-and-take discussion. It is important. I mean to have a nurse call [*sic*] who is stifled in her conversation and can't interject what she is really thinking about that patient or where you are not having a little bit of discussion, I think that is a deterrent to patient care. “Yes, I am the doctor—let me do this period!” To cut off that discussion would be horrible.

Physicians (MD1, MD2, and MD7) valued a nurse questioning an order or reminding a physician if he forgot a significant detail or action. MD2 chronicled that the nurse questioning an order promoted patient safety. MD7 related an example of a collaborative nurse functioning as an additional check for safety:

And I can remember, you know, on occasions, starting to give this medication and the nurse saying, “The patient had this problem or they had this ventricular problem; we might not want to use this medication because of that” . . . or adjusting medications because of that. [They] may say, “Doctor, you might be ordering something that is not right for the patient.”

Physicians (MD4, MD5, MD7, MD9, and MD10) also commended collaborative nurse input for treatment planning or decision making. MD4 credited the dialogue with the nurse, whom he described as a “sounding board,” as causing him to consider alternative actions and impacting his decision making. MD7 echoed the influence of nurse input on decisions:

I would say certainly we ask the advice of the nurses and then we come up with a plan so I guess in some sense that is asking for consensus on what to do. . . . And that will change how you do something or how you alter your treatment plan.

- d) advanced opinions and differences in an appropriate manner (MD2 and MD8). While physicians valued nurse opinions diverse from their own, two commented that the differences should be expressed in an appropriate way. MD2 explained that physician acceptance often was often dependent on the nurse approach. Acceptance was more likely if the nurse questioned in a “nice way.” MD8 indicted a nurse confrontational stance as being counterproductive to collaboration:

Having confidence and knowledge, not confrontational—there may be some nurse[s] who come across, “I am trying to play doctor” and that doesn’t get it. They can have all the knowledge and I am happy to hear suggestions so it is kind of the way that it may come across.

Nurse knowledge and competence (MD1, MD2, MD4, MD5, MD6, MD7MD8, MD9, and MD10). Four subcategories comprised the second category: A collaborative nurse (a) had excellent clinical judgment and experience; (b) used critical thinking skills proactively; (c) was well informed about the patient; and (d) developed patient psycho-social assessment and problem-solving skills. Physicians discussed that collaborative nurses exhibited these skills and knowledge bases.

- a) had excellent clinical judgment and experience (MD5, MD8, and MD9).

The clinical expertise of experienced nurses fostered collaboration with physicians. MD9 emphasized that clinical experience afforded them the knowledge and confidence to be more collaborative. MD8 stressed that he professionally depended on this clinically excellent nurse with whom he had a collaborative relationship:

The [collaborative] person, first of all, is a great nurse—clinically. . . . Clinically with a great awareness of patient issues with the anticipation of what is going on with a sick patient and thinking on their own. In doing that, that person becomes a major crutch to me. I depend on them. That is the ultimate. They are not the decision maker but very much they have knowledge, communicate well and they know when to call. Maybe it is my particular patients that they jive with and do very well with. But that's first—the clinical wherewithal. To see, recognize and be a good clinical, bedside nurse.

- b) used critical thinking skills proactively (MD4, MD5, MD7, MD8, and MD9). Physicians contrasted the collaborative, motivated nurse with a task-oriented nurse who followed directions but was not motivated to do more. MD5 posited that the collaborative nurse went “a step forward” to analyze the underlying cause of the problem before making a request of the physician. With a scenario MD8 explicated this analysis and its collaborative role:

Hey, Dr. Yates, this patient's Swan pressure has changed. . . . Something doesn't look just right. The numbers are a little different than they were 30 minutes ago. And we go over it and we take that as a cue and we talk about what the current situation is. . . . But that kind of a thing to be recognizing that something is different in this patient. Something is changing. More than just they don't have a pulse anymore. That is black and white. “Oh, the pulse is gone; call the doctor. “I am talking about something where it is almost a recipe of dynamics of caring for a patient. All these factors that are in—say for instance in the post op aortic patient—lots of fluids; lots of things going on; lots of tubes in their bodies. In that milieu that they live in, something is changing and that nurse who can say “Something is not right.” . . . That is not something that is necessarily taught but it is an innate sense about that individual that can pull that out and an interest on their part to pull that out and be able relay that information and bring it to attention. That is a valuable person.

They seem to be very well aware of the patient situation. They have gotten the information from whoever the previous nurse was or even who had taken care of the day before. . . . They have much more

information about the patient and they have read the chart. And they know about it. They can give whatever information they have to the physician and comprehend in a better way.

- c) was well informed about the patient (MD2, MD5, and MD6). Physicians confirmed that nurses who were quite knowledgeable about patient determinants strengthened collaboration. MD2 and MD5 identified the following factors as important: patient history, patient trends since hospital admission, all medical conditions, reports from the patient's previous nurse, and all patient medications and rationales for the medications. MD6 summarized knowledge which contributed to collaboration:

They seem to be very well aware of the patient situation. They have gotten the information from whoever the previous nurse was or even who had taken care of the day before. . . . They have much more information about the patient and they have read the chart. And they know about it. They can give whatever information they have to the physician and comprehend in a better way.

- d) developed patient psycho-social assessment and problem-solving skills (MD1, MD2, MD4, MD5, MD7, MD8, MD9, and MD10). The physicians stressed that because physicians were absent from the patient bedside and because critically ill ICU patients often were incapable of speaking, they valued nurse acquisition of social, historical, and psychological information and problem solving skills. MD10 noted that nursing psycho-social skills were valuable to patients and families struggling with to seek additional clinical or palliative care. MD7 explained that he depended on nurses for insights on family dynamics and discharge planning. MD4 illustrated the nurse collaborative role with families:

The nurse should not just be there to carry out the doctor's orders, but act as a liaison between information gathering, information delivery as well as a comprehensive care plan. There may be times when the doctor may have explained something to one relative and the patient and then another relative who may be closer to the patient comes in and the patient is not able to explain to the relative what the doctor has said; the nurse if he/she has been part of that process may be able to relay to the family.

Nurse-physician rounding process (MD2, MD3, MD7, and MD9). Physicians strongly supported joint physician-nurse rounding or visiting patients as fostering collaboration. While MD9 acknowledged that nurse multi-patient assignments made joint rounding difficult, he posited that if he were a nurse, he would definitely joint round to have questions addressed and to hear what the family heard.

MD2 supported joint rounding be adopted as a standard process:

I would love for the nurses to make rounds with us especially in the unit it is very important. I think it should be a standard. Unless there is an emergency while I am making rounds, I would like for them to make rounds with me.

IP1(b). Please Describe the Effects of This Collaborative Relationship Upon Patient Care. To address part (b) of question 1, which considered how a successful and collaborative professional relationship with a nurse affected patient care, the physicians made general conclusions and related specific stories of unnamed patients. The researcher identified three categories: (a) prevented crises in patients; (b) decreased medication errors; and (c) contributed to disciplining of medical staff member concerning unsafe practices.

Prevented medical crises in patients (MD8 and MD10). Two physicians reported that nurse-physician collaboration prevented two patients from crises. MD8 related that following an emergency ruptured aortic surgery, the nurse in collaboration

with the physician managed the complex patient recovery superbly. The physician described his confidence in the nurses' patient management competencies: "They are my right arm; they know I don't have to be standing there." MD10 described the results of nurse observation, intervention, and communication with him:

I had a patient admitted to the hospital with rectal bleeding. He was stable, but around like at 2:00 in the morning, his hemoglobin dropped like 14 down to 12. She gives me a call and says we see more blood and we need to take some action like infuse him, stabilize the patient and consultant coming in. . . . If she didn't call me, then in the morning, we may have a serious bleeding and severely anemic and didn't get the transfusion on time maybe coded and a lot more issue than just a telephone call. The observation so that's the spirit of collaboration.

Prevented errors (MD1, MD2, and MD7). These physicians described medication errors that were averted by nurse collaboration. MD7 related that a nurse had reminded him of a patient problem which contraindicated the medication he had ordered. MD2 described another example of nurse error prevention: "So I will say let's do this and this, and they will agree and then if I forget something, they will say the patient needs this and this patient needs that and then we are good."

Initiated a disciplinary procedure against a physician (MD 3). MD3 reported that a "seasoned" nurse initiated and worked with the medical staff to discipline with a physician:

One of the better episodes now coming to mind is not so much my interaction with the patient-care relationship, but the nurses interaction with the entire medical staff to improve patient care to try and discipline a physician who was performing below standard of care and exhibiting unethical behavior. She felt comfortable enough to bring it up to medical staff.

Identified depression overlooked by a physician (MD5). MD5 illustrated an effect in the psychosocial realm: "All the time I get valuable information from the

nurses and it could be someone complaining of all soreness symptoms may be underlying depression that the nurse picks up.”

IP2. How Has the Adoption of SBAR Affected (a) the Understanding That Occurs Between You and Nurses (ICU N-P Q, 6); (b) the Openness Between You and Nurses (ICU N-P Q, 3); (c) the Accuracy of Information Which You Receive From Nurses (ICU N-P Q, 2, 4, 7); and (d) the Timeliness of Information (ICU N-P Q, 10, 11, 12, and 13)?

The researcher investigated IP2 with the measurement of The ICU Nurse-Physician Questionnaire (ICU N-P Q). To discuss the effect of SBAR implementation on communication and collaboration, the researcher selected four questions from the ICU N-P Q-Physician Scale, which were organized into six subcategories.

Effect of SBAR on the understanding between you and nurses (ICU N-P Q, 3).

a) SBAR had no effect on understanding between physicians and nurses (MD1, MD2, MD3, MD5, MD6 MD7, MD8, and MD10). These eight physicians submitted that SBAR had not made a difference in understanding of reports which they received from nurses.

MD3, MD7, and MD3 posited that communication had been good with the ICU nurses previous to the SBAR implementation, and they thus far had been satisfied with the communication. MD5 asserted, “I am not sure that they have used it [SBAR] enough. They have not really implemented it as well as they could have.” Additional physicians stated this opinion in the next response, the *openness between you and nurses (ICU N-P Q, 3).*

- b) SBAR had a positive effect on understanding between physicians and nurses (MD9). One MD affirmed that SBAR increased understanding by standardizing the report:

It makes the nurse think about it. It makes them think about what they are going to say and it makes them think about what should be the next thing that we are going to do. So it is good for everybody.

Openness between you and nurses (ICU N-P Q, 3).

- a) SBAR had no effect on openness between physicians and nurses (MD1, MD2, MD3, MD5, MD6 MD7, MD8, and MD10). While three physicians maintained that their relationships with ICU nurses prior to SBAR had been open, two physicians posited that the ICU nurses had not been thoroughly adopted SBAR, as MD4 elaborated:

The good nurses do a good job and the other nurses have continued to work the way they used to. . . . The nurses may have done it for the first two weeks, but old habits die hard. . . . Until you change their mindset from the last six months of their nursing school, it is going to take a lot of time and effort to implement SBAR. What is interesting is that just two weeks ago, I get a call and the nurse immediately says Mr. So and so is having tachycardiac [*sic*] and I need to do this, can we do this and I say wait a minute who is this and whose patient. I am responsible for my colleague's patient. It would be nice to say Mr. So and so, who is a patient with MI, the patient of Dr. Rhodes has been here for three days and has had this problem and was doing fine and this happened. It is the norm that they completely forget. They are so trained to say finish off this phone call quickly and that is what we need to change.

- b) SBAR had a positive effect on openness between physicians and nurses (MD9). MD9 affirmed that SBAR had increased openness between him and nurses. He felt that nurses had to consider more before calling a physician:

I think so. For one thing, it makes the nurse think about calling you; you can't just say "the saturation rate is 30—you have to think about,"

“Should we get a chest x-ray; should we get arterial blood gases?” The nurse has to think about it, which is good. They shouldn’t just be drones passing medicines.

Accuracy of information which you receive from nurses (ICU N-P Q, 2, 4, 7).

- a) SBAR had no effect on the accuracy of information which physicians received from nurses (MD2, MD3, MD6 MD7, MD8, MD9 and MD10).

All physicians addressing this question said that SBAR had no effect on nurse information accuracy. MD9, who believed that the accuracy was unchanged, explained that he now received more information with SBAR. MD4 discussed the difficulty for nurses to satisfy the information needs of different individuals and specialties:

The problem is that the level and detail of information required varies so much between specialties, between patient’s and between doctors. It is difficult to generalize it and say you have to give this much or you do not need to give more than this. Many times to me, what would help the most to improve this is before they page the doctor, unless it is an emergency, if they would spend 45-50 seconds thinking I am calling the doctor on call and he does not know anything about this, so do I have that information and secondly, this is what I think is happening. That needs to happen before they call the doctor.

Timeliness of information (ICU N-P Q, 10, 11, 12, and 13).

- a) SBAR had no effect on the timeliness of information (MD2, MD4, MD7, MD8, MD9, and MD10). No physician reported that SBAR had impacted

information timeliness. MD9 affirmed that with SBAR he received more information:

The nurse will not just report a fact . . . but she will also think about it. “She has had some swelling in her leg; I think that she may have a blood clot.” That is a lot more information than before.

IP3. From a Physician's Point of View, What Is the Most Acceptable Verbiage for a Nurse To Use To Make the Recommendation? What Are Your Experiences or Reactions To Receiving the Recommendation Phase of SBAR From a Nurse?

The researcher presented the data which expressed divergent views.

Physician's preferred verbiage of the Recommendation. The physician comments did not support the phrasing of the SBAR *Recommendation* as nurses had been instructed to make it.

- a) preferred the Recommendation be phrased as a question (MD6, MD7, MD8, and MD9). When asked for an example of the question, MD7 said, "Do you think Lasix would help in a situation like this?" MD8 framed these questions as acceptable: "Would you be interested in this? What would do you think about . . . ?" MD9 stated that while he personally thought a statement was acceptable, in general he preferred a question:

There is a bit of a hierarchy there, and the physician is the one who is ultimately on the hook for what you decide to do. Again, I don't care if the nurse says, "I think that we should . . ." but if you want to make everyone happy a question "Do you feel that a chest x-ray would be indicated?" where you're asking . . . but you're not forcing it down somebody's throat. And then they can say "I can recommend this, this and this."

- b) preferred the Recommendation be phrased as a statement (MD10). MD10's choice for the Recommendation introduction was "I would suggest . . ."
- c) commented negatively regarding the nurse making a SBAR Recommendation (MD1, MD2, and MD3). MD1 and MD2 opined that they did not like the nurse giving a *Recommendation* prior to their own

recommendation. MD1 suggested making a *Recommendation* prior to hearing the physician's order was senseless and irritating.

- d) MD1 asserted, "Most commonly, the nurse should put the ball in the physician's court. What is the point in calling a physician if you are going to do a *Recommendation*?" MD3 felt that the nurse *Recommendation* interrupted his analytical process of listening, assessing, deciding ordering and acting.

Physician experiences with receiving the Recommendation phase of SBAR.

- a) appeared to accept the *Recommendation* phase from a trusted nurse.(MD1 and MD8). MD8 suggested that he could accept a *Recommendation* question "if it is in the ballpark. If it is way out, there goes my confidence level." MD1, who in the previous section negatively responded to the nurse *Recommendation*, discussed a positive SBAR experience with a trusted (i.e., collaborative) nurse:

I think I go along with this. A couple of nights ago, one nurse called me at night about a patient and I told the nurse, I do not know this patient very well, but if this is what needs to be done, take him to a unit and perform basic protocol. I am comfortable in them recommending things. This particular nurse I know. I told her to go ahead and take care of that problem, because you are with the patient, you probably know better than me what to do because you are there. First you need to have a common ground.

- b) responded to the nurse *Recommendation* in a punitive manner (MD2). MD2 related his reactions to the *Recommendation*:

I have a reputation; the nurses are scared to tell me things. They will ask if they can give Lasix and I will say why you would do that, are you sure the patient is in congestive heart failure and not pneumonia or a

crackle. . . . Sometimes I do that to nurses when they give me a *Recommendation*.

- c) responded positively to the *Recommendation* (MD6). MD6 described his response to receiving the SBAR *Recommendation*:

When they assess the patient and they say in my *Recommendation*, the patient has this critical illness; his interests will be served better if he is transferred to this monitored bed from the floor. When they give that specific *Recommendation* from their point of view, I think that I mainly appreciate it.

IP4. As With Any Change, I Am Sure That You Have Made or Heard Remarks, Told or Heard Stories, or Heard or Had Conversations About SBAR and Its

Implementation. Please Share Some of These To Help Us Understand More Fully the Attitudes Toward This Communication Too.

- a) Both MD3 and MD7, who did many consults on other physicians' admitted patients, suggested that nurses be taught to stress the situation, background, and assessment of SBAR when talking to a consulting physician, who was not familiar with the patient. MD2 asserted that the recommendation portion of SBAR should be improved:

Someone used SBAR on me and I told that nurse to hold on. If it is a nurse that I trust after I give my recommendation, I will ask if I covered everything. When the nurse spits out what they want you to do, they should let me do my recommendation, and then they can add on. I think you can improve the *Recommendation* portion of SBAR.

- b) posited that not all nurses were using SBAR (MD5 and MD9). MD5 remarked that he had heard that not all the nurses were using SBAR. MD9 related, "One of the things that I have heard from some of the doctors is that they do not think that it is used as much on nights—that it is used on days."

- c) supported training for novice nurses (MD5). MD5 advocated SBAR for new nurses:

This should be implemented more for the newer nurses. If good nurses call and says [*sic*] this guy has a little rectal bleeding and it is pretty bad, I will think this is a good nurse and she knows what she is doing. I will believe it right away, because they did not just pick up the phone and dial without thinking because things have been thought through. To get nurses in the habit of doing SBAR when they are new, so down the road, they will get better and better.

Summary of Findings

The study design had a two-phase design: (a) the first two questions used a non-experimental quantitative design and (b) the third question used a qualitative design. These investigations yielded the following findings, presented in the order of the three research questions.

RQ1: Did the Implementation of SBAR, Used in the ICU as Nurses Reported Patient Changes and Needs To Physicians, Result in Improved Collaboration Between the Unit Physicians and Nurses as Measured by the Collaborative Practice Scales and the Individual Subscales of the Physician and Nurse Scales?

Community Hospital ICU nurses and physicians perceived the effect of the SBAR protocol on collaboration differently. *Nurses* perceived that collaboration, their direct assertiveness of professional expertise/opinion and their active clarification of mutual responsibilities had improved significantly since SBAR had been implemented. Nurse composite scores on the nurse scale of the Collaborative Practice Scale, Nurse Subscale 1: *the direct assertive of professional expertise/opinion*, and Nurse Subscale 2: *the active clarification of mutual responsibilities* significantly improved from pre SBAR (Time 1) to four months after the SBAR implementation (Time 3).

Physicians did not evaluate that a significant improvement had occurred in any of three CPS physician measures: the physician scale composite scores of the CPS, Subscale 1: *consensus development with nurses* or Subscale 2: *acknowledgment of the nurse's contribution to patient care*.

RQ2: Did the Implementation of SBAR, Used in the ICU as Nurses Reported Patient Changes and Needs to Physicians, Result in Improved Communication Elements of (a) Openness, (b) Accuracy, and (c) Understanding between the Unit Physicians and Nurses as Measured by Selected Scales of the ICU Nurse-Physician Questionnaire?

In the *openness* communication element, a significant difference was identified by profession. At Time 1, the physicians scored significantly higher than the nurses. This significant profession effect was not present in subsequent data collection times. No significant effects were identified in the element of *accuracy*.

The most significant differences were identified in the *understanding* communication element. Significant effects were identified in both time and profession. In the nurse data, significant effects existed between Time 1 and Time 2 and between Time 1 and Time 3. No significant time effect was identified for the physicians. Similar to the CPS scores and the openness element score, the physician scores were significantly higher than nurse scores at Time 1 but were not significantly different at Time 2 or Time 3.

RQ3: What Were the Nurse and Physician Attitudes Toward Collaboration and Communication Regarding SBAR Implementation as Measured by Interviews?

The researcher presents the findings in order of the interview protocol question.

Characteristics of Collaborative Physicians and Nurses.

Nurses spoke positively of the professional collaborative relationship with a physician and its effects on their professional development and on patient outcomes. In these relationships, they experienced being contributing, valued members of patient care teams. Collaborative physicians exhibited strategies, behaviors, and attitudes in their interactions with them (APPENDIX N). Skilled communicators, they immediately created rapport when entering the unit, gave eye contact, listened well, explained fully, and positively reinforced nurses.

In their practices, they encouraged nurses to be team members by: (a) visiting patients at early, predictable times, thereby allowing nurses to be prepared; (b) inviting the nurses to jointly review charts; (c) verbalizing and explaining orders; and (d) requesting nurse accompaniment on patient rounds. These physicians affirmed nurses as colleagues by responding positively to nurses' assertive behaviors of telephoning with questions, stating that orders might have been inappropriate, nurse assessments which differed from theirs, and visiting hospital patients due to nurse requests and assessments.

Several nurses also described uncollaborative physicians, the "other" physicians who were deemed by some nurses as unapproachable, intimidating, disingenuous, disrespectful, and not tolerating nurse assertiveness. This assertiveness included the nurse questioning an order or asking for a patient treatment.

Physicians, too, identified characteristics of nurses with whom they had collaborative relationships. The characteristics comprised three categories of communication strategies, knowledge and competence, and nurse-physician rounding process.

Some physicians praised nurses who (a) reported in an organized manner; (b) listened well to their opinions; (c) engaged in dialogue which questioned an order, gave treatment input and served as a “sounding board”; and (d) asserted opinions and differed in an appropriate, nonconfrontational manner.

Physicians affirmed the importance of nurse knowledge and competence to collaboration. One physician summarized the qualities paramount for a collaborative relationship:

The [collaborative] person, first of all, is a great nurse—clinically. . . . Clinically with a great awareness of patient issues with the anticipation of what is going on with a sick patient and thinking on their own. In doing that, that person becomes a major crutch to me. I depend on them. That is the ultimate.

Physicians opined that the collaborative nurse had extensive patient information, including history, trends since hospital admission, all medical conditions, previous nurse reports and all patient medications, including prescribing rationales. Physicians depended on nurse patient psycho-social assessment and problem-solving skills and strongly supported joint physician-nurse rounding on patients.

Physicians described noncollaborative nurse behaviors of disorganization and lack of preparation which caused rework. MD2 opined that younger “nurses were not as good as the older nurses” and did not apprise themselves of critical patient information from the preceding shifts. MD6 posited that when working on a case with other physicians, “two or three” nurses if they disagreed with his order would contact the other physicians and “get it done through some other physician.”

Effects of Collaborative Nurse-Physician Relationships

Nurses opined that nurse-physician collaboration resulted in positive end-of-life care, quicker extubation from ventilators for patients, and unexpected recovery of critically ill patients. RN3 affirmed the importance of the collaborative relationship to her professional identity and patient care outcomes:

I felt really good about that patient, because she received total care—360 degrees. There was constant communication with the physician and the family, with the family and the physician, especially between nurse and doctor relationship. I could tell him anything, and he would come look at it, or he would give credence and check it out . . . She should have never lived and she did. For her to have lived—here was a miracle. It was the constant attention she received when she needed it.

Physicians deemed that a successful and collaborative professional relationship with a nurse affected patient care by prevented patient crises, decreasing medication errors, and contributing to a medical staff member disciplining. Two physicians reported that nurse-physician collaboration prevented two critically ill patients from further crises. Another physician identified a psychosocial effect when the nurse “picked up” an undiagnosed depression. MD8 described his confidence in the nurses’ patient management competencies: “They are my right arm; they know I don’t have to be standing there.” Three physicians submitted that nurse questioning and input

averted medication errors, thereby in these cases assuring patient safety. A physician described the leadership of a "seasoned" nurse, who initiated and worked with the medical staff to discipline a physician practicing unsafely.

Effect of SBAR on Nurse-Physician Relationships and Communication Elements

Nurse interview responses partially supported the RQ1 findings: Following the SBAR implementation, collaboration as measured on the nurse Collaborative Practice Scales had improved and the RQ2 findings that communication elements as measured on The ICU Nurse-Physician Questionnaire had improved. A majority of nurses reported that communication and relationships with physicians had improved since SBAR implementation. Four nurses, all of whom had more than five years of nursing experience, declared that SBAR implementation had not affected their relationships because they were giving the required information prior to the SBAR implementation. A majority of nurses opined that *understanding* between the physicians and themselves had improved because SBAR use brought organization and conciseness to communication. Since report efficiency resulted in fewer call backs to physicians, SBAR organization was deemed to improve timeliness of information. The majority of nurses agreed that no change had occurred in openness or enjoyment of talking with physicians.

The nurse and physician respective interview questions were slightly different for IP2: Physician responses supported the physician findings of RQ2, which showed no significant change in any of the communication elements since SBAR implementation. Eight physicians submitted that SBAR had not made a difference in

either *understanding* or *openness* between physicians and nurses. Three physicians were satisfied with the *understanding* and *openness* prior to SBAR implementation and did not think improvement was necessary. Three physicians posited that the ICU nurses had not thoroughly adopted SBAR. One physician voiced that SBAR had increased *openness* and *understanding* between physicians and nurses by standardizing the report. None of the physicians perceived that SBAR had an effect on information *accuracy* or *timeliness*.

Phrasing of and Experiences with SBAR Recommendation

Nurses posited that the SBAR *Recommendation* phase, designed and taught to be delivered as a statement, was unsatisfactory. Eight of the 10 nurses phrased the *Recommendation* as a question because they did not want to seem “pushy” (RN8) or to “satisfy older physician attitudes and egos” (RN3). Following SBAR implementation, the majority of nurses reported that they phrased the *Recommendation* as a question; two new nurses employed a tentative statement, “I think possibly Lasix may be a good order if you'd be okay with that” followed by a question, “What do you think or suggest?”

The physician comments did not support the phrasing of the SBAR *Recommendation* as nurses had been instructed to make it. Four physicians preferred the *Recommendation* be phrased as a question: “Do you think Lasix would help in a situation like this?” or “Would you be interested in this? What would do you think about . . . ?” One physician preferred the *Recommendation* be phrased as a statement introduced by, “I would suggest” Three physicians negatively commented about

the nurse making a SBAR *Recommendation* prior to their own recommendation. One perceived that the nurse *Recommendation* interrupted the analytical process of listening, assessing, deciding ordering, and acting; another perceived that recommending was the physician's role.

Four nurses reported positive experiences with physicians when they used SBAR because the protocol helped organize the report. Nurses expressed comfort in giving the *Recommendation* to physicians with whom they had a collaborative relationship. RN2 described making a *Recommendation* to a physician she considered uncollaborative:

Some physicians are so close-minded to the nurse's roles, they will almost tell you to go away. They would rather you read the progress note rather than discuss it with you. If we make a *Recommendation*, we have to actually do it in a way that it comes out as their thought.

RN9, a night nurse who often used SBAR with sleeping physicians, complained: "Most of them do not want to hear it. 'Why did you call me?' . . . Those types don't want a *Recommendation*."

While one physician was positive about receiving a *Recommendation*; one related a story of responding punitively to a nurse who gave a *Recommendation*. Two physicians opined that they could accept the *Recommendation* phase from a trusted nurse.

Stories Heard Concerning SBAR Implementation

The majority of experienced nurses complained that they already practiced SBAR principles. The majority of nurses, including experienced nurses, strongly endorsed SBAR training and practice for inexperienced nurses. One nurse told of a respected physician who effectively coached her through the SBAR steps. She posited that physicians coaching nurses was an effective change strategy.

Two consulting physicians suggested that nurses be taught to stress the situation, background, and assessment of SBAR when talking to a consulting physician. Two physicians questioned whether all nurses were using SBAR; one questioned if night nurses were using it as much as day nurses. One physician supported training for novice nurses.

CHAPTER V

SUMMARY AND CONCLUSIONS

In this chapter, the researcher addresses purpose of the purpose, summary of findings, discussion, limitations of the study, implications, and conclusion.

Purpose of the Study

The purpose of this study was to examine the effect of the Situation, Background, Assessment, and Recommendation (SBAR) communication protocol, used as nurses reported patient changes and needs to physicians, on physician-nurse collaboration and communication in an Intensive Care Unit (ICU). The researcher addressed three research questions (RQ):

RQ1: Did the implementation of SBAR, used in the ICU as nurses reported patient changes and needs to physicians, result in improved collaboration between the unit physicians and nurses as measured by the Collaborative Practice Scales and the individual subscales of the physician and nurse scales?

RQ2: Did the implementation of SBAR, used in the ICU as nurses reported patient changes and needs to physicians result in improved communication elements of (a) openness, (b) accuracy, and (c) understanding between the unit physicians and nurses as measured by selected scales of the ICU Nurse-Physician Questionnaire?

RQ3: What were the nurse and physician attitudes toward collaboration and communication regarding SBAR implementation as measured by interviews?

Summary of Findings

Figure 7 displays a summary organized by professions of RN and MD in the first columns, by RQ1 and RQ2 in the second column, and by RQ3 in the remaining columns headed by interview protocol (IP) question number and the question synopsis. Within each column divided into RN and MD sections, the researcher presents a brief findings summary.

	RQ1 and RQ2	RQ3	RQ3
Interview Protocol (IP) and Research Questions (RQ)	(RQ1) Post SBAR, did collaboration improve on CPS? (RQ2) Post SBAR, did communication elements improve on ICU N-P Q?	IP1a: Describe a Professional Relationship with a MD That You Considered Collaborative.	IP1b: Describe the Effects of This Collaborative Relationship on Patient Care.
Profession RNs	RQ1; The Collaborative Practice Scale CPS Findings: The nurse composite scores and two subscale scores of the CPS significantly improved from Time 1 to Time 3. RQ2; The ICU Nurse-Physician Questionnaire (ICU N-P Q) Findings: In <i>openness</i> , the nurses scored significantly lower than the physicians at Time 1 but at no other time. No significant effects were identified in <i>accuracy</i> . In <i>understanding</i> , nurse scores improved significantly between Times 1 and 2 and 1 and 3; the nurses scored significantly lower than the physicians at Time 1 but not at any other time.	Collaborative MDs were <i>skilled communicators</i> , who created rapport, gave eye contact, listened well, explained fully, and positively reinforced. In their <i>practices</i> , collaborative MDs visited patients at predictable times, invited the RNs to jointly review charts, explained orders, and requested RN/MD joint rounds. MDs affirmed RNs as colleagues by responding positively to RNs who called with questions or questioned inappropriate orders and by responding to RN requests to visit patients. Some RNs described uncollaborative MDs, as unapproachable, intimidating, disingenuous, disrespectful, and not tolerating RN assertiveness.	RN- MD collaboration resulted in positive end-of-life care, quicker patient extubation from ventilators, and unexpected patient recovery. RN3 affirmed the importance of the collaborative relationship to her professional identity and patient outcomes: "I felt really good about that patient, because she received total care—360 degrees. There was constant communication . . . especially between nurse and doctor relationship. I could tell him anything, and he would come look at it, or he would give credence and check it out . . . For her to have lived—here was a miracle. I think it was the constant attention she received when she needed it."

	RQ1 and RQ2	RQ3	RQ3
Interview Protocol (IP) and Research Questions	(RQ1) Post SBAR, did collaboration improve on CPS? (RQ2) Post SBAR, did communication elements improve on ICU N-P Q?	IP1a: Describe a Professional Relationship with a MD That You Considered Collaborative.	IP1b: Describe the Effects of This Collaborative Relationship on Patient Care.
Profession MDs	<p>RQ1; The Collaborative Practice Scale (CPS) Findings:</p> <p>No significant effects were found in either Physician Subscale 1: nurse acknowledgement or in Physician Subscale 2: consensus development.</p> <p>RQ2; The ICU Nurse-Physician Questionnaire (ICU N-P Q) Findings:</p> <p>In <i>openness</i>, physicians scored significantly higher than nurses at Time 1 but not at other times.</p> <p>No significant effects were found in <i>accuracy</i>.</p> <p>In <i>understanding</i>, physician scores were significantly higher than nurse scores at Time 1 but not at any other time.</p>	<p>Some MDs praised RNs who (a) reported in an organized manner; (b) listened well; (c) questioned an order and gave input to treatment; and (d) advanced opinions and differences in an appropriate, nonconfrontational manner.</p> <p>MDs affirmed the importance of RN knowledge and competence to collaboration. Collaborative RNs had extensive patient information. MDs depended upon RNs with developed patient psychosocial assessment and problem-solving skills. MDs supported joint physician-nurse patient rounding.</p>	<p>MDs deemed that a collaborative relationship with a RN prevented patient crises, decreased medication errors, and contributed to MD disciplining.</p> <p>MDs reported that RN-MD collaboration prevented crises in critically ill patients. A MD related that a RN "picked up" an undiagnosed depression.</p> <p>MD8 praised the RN's patient management competencies: "They are my right arm; they know I don't have to be standing there." MDs declared that RN errors questioning and input averted med errors.</p>

	RQ3	RQ3	RQ3
Profession	IP2: Effects of SBAR on RN- MD <i>understanding, openness, and accuracy.</i>	IP3: What are your <i>Rec. 1</i> phrasing preferences and experiences with SBAR?	IP4: What stories or comments have you heard regarding SBAR?
RNs	<p>RN responses supported RQ1 findings: Post SBAR, collaboration as measured on the nurse CPS significantly improved and RQ2 findings that understanding elements as measured on the ICU N-P Q significantly improved.</p> <p>A majority of RNs reported in interviews that communication/ relationships with MDs improved Post SBAR. Four RNs, with more than 5 years RN experience, declared that SBAR implementation had not affected their relationships because they were giving identical information pre-SBAR.</p> <p>A majority of RNs opined that <i>openness or enjoyment of talking with MDs.</i> had not changed but <i>understanding</i> between MDs and RNs improved because SBAR brought organization which also improved <i>timeliness of information.</i></p>	<p>RNs posited that the SBAR statement <i>Rec. 1</i> was unsatisfactory. Eight RNs phrased the <i>Rec. 1</i> as a question because they did not want to be “pushy” (RN8) or to “satisfy older physician . . . egos” (RN3). 2 RNs tentatively stated, “I think possibly Lasix may be a good order if you'd be okay with that” followed by a question, “What do you think or suggest?”</p> <p>Four RNs nurses reported positive SBAR experiences because SBAR organized the report. RNs expressed comfort in giving the <i>Rec. 1</i> to MDs with whom they had a collaborative relationship. RN2 described making a <i>Rec. 1</i> to an uncollaborative MD: ‘Some MDs are so close-minded to the RNs’ roles, they will almost tell you to go away. . . If we make a <i>Rec. 1</i>, we have to actually do it in a way that it comes out as their thought.’”</p>	<p>The majority of experienced RNs (more than 5 years experience) complained they already practiced SBAR principles before the implementation.</p> <p>The majority of RNs, including experienced RNs, strongly endorsed SBAR training and practice for inexperienced RNs.</p> <p>One RN told of a respected MD who effectively coached her through the SBAR steps. She posited that MDs coaching RNs was an effective change strategy.</p>

	RQ3	RQ3	RQ3
Profession	IP2: Effects of SBAR on RN- MD <i>understanding, openness, and accuracy.</i>	IP3: What are your <i>Rec.</i> ¹ phrasing preferences and experiences with SBAR?	IP4: What stories or comments have you heard regarding SBAR?
MDs	<p>MD responses supported RQ2 findings of no significant change in communication elements post-SBAR. Eight MDs submitted that SBAR had not effected a change in either <i>understanding</i> or <i>openness</i> between MDs and RNs. (Three MDs were satisfied with the understanding and openness prior to SBAR).</p> <p>Three MDs posited that the ICU RNs had not thoroughly adopted SBAR. Only one MD voiced that SBAR had increased openness and understanding by standardizing the report.</p> <p>No MDS said that SBAR effected <i>information, accuracy, or information timeliness.</i></p>	<p>MD comments did not support a statement <i>Rec.</i>¹; 4 MDs preferred a question <i>Rec.</i>¹ “Do you think Lasix would help in a situation like this?” or “Would you be interested in this? One MD preferred the <i>Rec.</i>¹ statement with verbiage: “I would suggest. . . .”</p> <p>Three MDs were negative about <i>Rec.</i>¹ RN <i>Rec.</i>¹ interrupted MD analytical process and recommending was MD’s role. One MD was positive about receiving a <i>Rec.</i>[*]; one related a story of responding punitively to a nurse who gave a <i>Rec.</i>¹ two MDs could accept a <i>Rec.</i>¹ from a trusted RN.</p>	<p>Two consulting MDs suggested that RNs be taught to stress the SBA (situation, background, and assessment) of SBAR when talking to a consulting MD.</p> <p>Two MDs questioned whether all RNs were using SBAR; one questioned if night RNs were using it as much as day RNs. One physician supported training for novice RNs.</p>

Note: *Rec.*¹ represents the SBAR *Recommendation* phase.

Figure 7. The findings.

Discussion of the Findings

The RQ3 discussion, including linkages to the literature, precedes the RQ1 and RQ2 discussions because it provides the context for interpreting the RQ1 and RQ2 findings.

RQ3: What were the nurse and physician attitudes toward collaboration and communication regarding SBAR implementation as measured by interviews?

The researcher discusses positive attitudes toward the effects of collaboration.

She applies a behavioral definition to nurse-physician collaborative culture, inferred from IP1 interview data. She then addresses SBAR findings generated by IP3 data.

The Nurse-Physician Collaborative Culture

When asked to describe collaborative interdisciplinary relationships, nurses and physicians narrated positive stories of teamwork. Crediting nurse assessment and communication and physician listening, trust, and response to nurse input, nurses with great pride related stories of patient lives being saved and terminal patients dying more peacefully. RN3 illuminated the potential of collaboration to engender optimal patient care when she described the constant communication with the physician who received “360 degree total care.” She credited her “miracle” ICU discharge to “the constant attention she [the patient] received when she needed it.”

Some physicians also praised nurse-physician collaboration. They chronicled patient medical crises being averted by nurses’ astute observations and follow-through calls to physicians, medication errors prevented by the nurse questioning an order, informed families with whom the nurse had been a communication liaison, and disciplinary actions stopping unsafe physician practices. MD8 stressed his professional dependence on a clinically excellent and critically thinking nurse: “In doing that, that person becomes a major crutch to me. . . . That is a valuable person. . . . I depend on them. That is the ultimate.”

In evaluating the collaborative culture of the Community Hospital ICU, stories of specific nurse-physician partnerships described glimpses of the culture. To understand the entire culture with its complexities in practice, the researcher applies a behavioral definition from the Institute of Medicine (IOM):

(a) shared understanding of goals and roles; (b) effective communication, characterized by . . . open and inclusive discussion and active listening; (c) attitudes of inclusiveness, openness, and acceptance of a member's ideas and opinions; and (d) practices for positive conflict resolution and "shared decision making." (p. 214)

In their descriptions of exemplary interdisciplinary collaborative relationships, several nurses and physicians experienced elements of "effective communication," included in Appendices N and O. One nurse described "shared understanding of goals and roles" with a collaborative physician who conferred the patient goals for the day each morning. A few nurses experienced "openness and inclusiveness," similar to that of RN2 who emphasized that a physician pulled up a chair for her at *his* level for their joint chart review. Nurses and physicians told stories of "acceptance of a member's ideas and opinions" related to care decisions and questioning of orders. Collaboration or teamwork between most nurses and physicians, however, based on *all* the IOM behaviors did not exist at Community Hospital. Half of nine nurses agreed that while the collaborative physicians accepted and even valued their questioning of orders, they were uncomfortable questioning uncollaborative physicians.

Even in collaborative relationships, no physician or nurse discussed "practices for positive conflict resolution or 'shared decision making.'" Only one nurse or physician inferred a conflict resolution practice. Defending her patient safety responsibility, RN3 narrated the physician practice, initiated when she questioned an inappropriate order:

We should be allowed to say that without any repercussions or any fear. If the doctor is not in a good mood, he will go and scream at your boss, your boss will come out and say he is in there screaming. More than not, you do have that.

When nurses were asked to address collaborative relationships, they often established the value of these “special” relationships through contrasts to uncooperative, dismissive, and intimidating relationships. Sometimes this contrast was subtly made through diction; two nurses used *safe* in describing their comfort in calling collaborative physicians. In the word choice of *safe*, RN3 implied fear of telephoning most physicians: “You feel safe to call him anytime and say this just does not look right and he is not going to say that is just ridiculous and you are stupid, don’t call”. Two nurses emphasized the rarity of being asked for input through their adverb choices: one nurse employed *even*; another used *actually*: “He actually asks your input; what you have seen, how you think this has healed or has progressed and he actually values your opinion” (RN3).

Other nurses more directly contrasted the collaborative relationships by establishing an antithetical category of the “other” relationships. One nurse commenced to characterize the trusted physician’s communication skills prior to disparaging the “other”:

Because he listens. He values what you say. He doesn’t just dismiss it. It is important information. Where as, there are other physicians you talk to who don’t seem to value what you say. They dismiss what you say. It’s not good for the patient. It’s not good for patient care. It’s more what they say and how they say it. Like you might give them information that they almost just ignore it. They just don’t do anything about it. (RN7)

Another nurse, making a suggestion, denigrated physicians whom she experienced as “belittling”:

When they give us an explanation about why, and especially when they put it to where we can understand it, where they are not belittling us or making us feel that we are stupid for suggesting that. Because sometimes we get that when we suggest that-sometimes they don't want you to suggest anything. (RN9)

These frustrated nurses displayed similar attitudes to those registered in a national nursing survey, which measured attitudes related to the culture and collaborative working relationships (Ulrich, Buerhaus, Donelan, Norman, & Dittus, 2005). According to this survey only 26% of the nurses rated their opportunities to influence patient care: as *excellent* or *very good*, 32% assessed their opportunities as *good*, and 40% rated their opportunities were only *fair* or *poor*.

Addressing their frustrations to influence patient care, two nurses introduced physician hierarchical power and nurse disingenuous adaptations to control:

When a physician is not allowing you to do what you see has been proven through your practice and would help [the patient], it makes a nurse have a hard time when going in to see that patient In the back of your mind, you are playing a little game and it is not fair to the patient or the family. Now with the other physicians [uncollaborative physicians]—there are some here that you cannot approach at all. The nurses have to be manipulative to say what you think, because none of your ideas are accepted. These are the physicians the nurses do not like. We, as nurses, like being part of a team. (RN2)

RN7 captured this acrimonious relationship with physicians when explaining her rationale for preferring a question for the SBAR *Recommendation*:

Well, maybe it is a power issue. I don't really know. I've just learned over time through experience that when you ask, if you put it in a form of a question, you're more likely to get what you want than if you say they need this. I don't know why.

Jones, DeBaca, and Yarbrough (1997) addressed the inhibiting effect of hierarchy culture on change readiness. Developing a survey based on Cameron and

Quinn's Competing Values Framework, Jones et al. (1997) measured the cultures on (a) clan culture, based on norms of affiliation, trust, and organizational commitment; (b) adhocracy culture, which stressed flexibility and individuality; (c) hierarchical culture, which emphasized compliance on rules and bureaucracy; and (d) market culture, which stressed achievement and reward. Jones et al. (1997) suggested that high teamwork (clan) values were predictive of greater change readiness. They affirmed that a reactive orientation marked by strong hierarchical values, a command and control orientation, and a rule orientation impeded change efforts.

When describing collaborative nurse qualities, physicians sometimes identified nurse shortcomings: "The nurses will page me without putting any thought to what they need to let me know. They start thinking SBAR after the doctor has called" (MD4). The physicians, however, neither conceptualized the dualities of the collaborative versus the "other" nurses nor did they express wanting greater nurse-physician collaboration.

The researcher speculated that physicians explicated eight nurse roles which advanced nurse-physician collaboration. Important to the physicians were nurse roles related to communication: (a) *assessor and alerter* of ICU patient changes and trends: "I can rely on them like they are my eyes, ears and hands So, when they see things change . . . they give me a call Then I can take some action and take care of the patient" (MD10); (b) *communicator with families*: "The doctor may have explained to a relative and patient and then another relative . . . comes and the patient is unable to explain . . . ; the nurse . . . may be able to relay" (MD7); and (c) *information gatherer and conveyer*: "We are sort of limited in getting history to, a lot of times, they will help us in getting appropriate history. To me, history checking is great" (MD5).

Three physicians offered the role of (d) *patient safety enhancer*:

And I can remember, you know, on occasions, starting to give this medication and the nurse saying, “The patient had this problem or they had this ventricular problem; we might not want to use this medication because of that” . . . or adjusting medications because of that. [They] may say, “Doctor, you might be ordering something that is not right for the patient.” (MD7)

Five physicians commended the collaborative nurse role of (e) *advisor for treatment planning or decision making*. MD4 credited dialogue with a nurse, whom he described as a “sounding board,” as prompting him to consider alternative actions and impacting his decision making.

Two physicians advanced related roles: (f) *resource and process scheduler* and (g) *physician orders executor*. When asked for a nurse-physician collaboration example, MD1 asserted that such assistance happened constantly:

I told the nurse I am tied up with a lot of stuff and the nurse said what do you want me to do? . . . So I told her to get a surgeon who can do this [PICC line] for me. The nurse took care of this and helped the patient by getting the stuff I needed.

MD6 stressed the nurse supportive function in (h) *executer of orders*:

The main thing is going to be initiated by the physician. He is the driver of the bus. The nurse role is supportive and to keep on providing the information to the physician and if the nurse has that role in her mind and well adapted to it, I think that is absolutely necessary for the care of the patient . . . Obviously, the physician is not going to be with the patient all the time—it is the nurse and if she keeps on giving that information and [thinks] my job is to carry out the order or whatever the new development [*sic*] are . . . that is going to be a collaborative team.

Through the description of a collaborative nurse exhibiting experience, critical thinking, and clinical skills, a physician illuminated the final role: *patient care partner*:

“Who has this patient?” And when they say so and so, I go “OK.” Because I know that she is going to know everything. It makes a huge difference—the anticipation. That makes a difference. That kind of thing in that critical time

after say a ruptured aneurysm. They are critically ill. And giving those fluids, doing things right, anticipating those fluids, keeping them from going into renal failure without me—days and days of other times and other people, I stand at the bedside watch these people and say “OK, Do this; do that”—that kind of collaboration with this kind of nurse, I know that they are there; it is not necessary; they are my right arm; they know I don’t have to be standing there. (MD8)

From the preceding contrasting nurse and physician views, the researcher submits that the two professions define collaboration in practice differently and possess contrasting expectations. After conducting a study to determine the impact of an interdisciplinary intervention on nurse-physician communication and collaboration in an ICU, Vazirani et al. (2005) posited that nurses and physicians experienced collaboration very differently.

The difference between physicians and nurses in their reports of a collaborative effort is striking. Physicians may define collaboration in a different light than do nurses . . . Perhaps the physicians thought that collaboration implied cooperation and follow-through with respect to following orders rather than mutual participation in decision making. (p.75)

Certainly, most of the collaborative nurse roles, expressed by physicians previously, represent implied cooperation with following orders and physician assistance with tasks and communication so that the physician may care for the patient. The culture as experienced by some nurses and physicians is a gentle and polite hierarchy but by others the culture is a command and control hierarchy where power, as RN7 suggested, is sometimes used to dominate.

In her ethnographic study of decision making in three ICUs, Coombs (2003) conducted in-depth ethnographic interviews, participant observations, and literature and document reviews. Three themes emerged: the diverse knowledge and roles used in

clinical decision making, power, and conflict in clinical decision making. While many perceptions of mutual working relationships were expressed in the interviews, “an enduring observation across the data concerned control and input into the decision making process” (p. 129). Similar to the Community Hospital nurses and physicians, nurses in Coombs’s study believed that physicians controlled clinical decisions with little influence by nurses; physicians seemed oblivious to the ways that they shaped the nursing role in the clinical area. Coombs (2003) concluded that traditional hierarchies continued and that nursing contributions were limited by physicians and by nurses, themselves. This researcher returns to Coombs’ self-limiting nurse behavior theory in the paragraph concerning SBAR *Recommendation*. Coombs (2003) opined that physicians expected nurses to have intimate knowledge of the patient. She exemplified how the nurse patient assessment was ignored when the physician made treatment decisions:

In ignoring these fundamental principles in the nursing philosophy and knowledge base, the power of medicine’s knowledge over nursing power in medical knowledge was displayed. Power in medical knowledge was also demonstrated through nurses being largely unquestioning and unchallenging of the medical management plan. (p. 130)

Coombs believed that physicians controlled clinical decisions with minimal nurse influence; physicians lacked awareness how they shaped the nursing role in the clinical area. Concluding that traditional hierarchies continued, she (2003) posited that the contributions of nursing were limited by physicians and by nurses, themselves.

Findings Related to SBAR

Perhaps the overwhelming rejection of the SBAR *Recommendation* statement by both professions was an example of Coombs’ idea of limiting nursing contributions by both physicians and nurses, themselves. Vazirani et al. (2005) in explaining how nurses

and physicians view collaboration differently, explicated a motive for nurses not adopting the assertive statement: “A second possibility is that nurses did not feel comfortable ‘challenging’ physicians by giving another point of view” (p. 75).

Eight of the 10 nurses in this study phrased the *Recommendation* as a question because they did not want to seem “pushy,” questioning “his abilities” (RN8), or to “satisfy older physician attitudes and egos” (RN3). While two new nurses employed a statement: “I think possibly Lasix may be a good order if you'd be okay with that” followed by a question, “What do you think or suggest?” (RN10), the timidity and tentativeness of the remark limited the nurse’s credibility and did not engender confidence in either the physician or herself. Because the only two nurses who used the *Recommendation* statement were new nurses, perhaps they chose the tentative statement followed by a question to adapt to both superiors: nursing leaders who taught the *Recommendation* to be given as a statement and seven physicians who did not support the statement or even the *Recommendation* when nurses phrased it as a question. Among the four physicians, who preferred a question, was MD9 who personally deemed that a statement was acceptable but that he preferred a question to placate others in a hierarchical culture:

There is a bit of a hierarchy there, and the physician is the one who is ultimately on the hook for what you decide to do. Again, I don’t care if the nurse says, “I think that we should . . .” but if you want to make everyone happy a question “Do you feel that a chest x-ray would be indicated?” where you’re asking . . . but you’re not forcing it down somebody’s throat. And then they can say “I can recommend this, this and this.”

When they used SBAR, four nurses reported positive experiences because the protocol organized the report; two newly hired nurses praised SBAR structure. Most nurses strongly endorsed SBAR training and practice for inexperienced nurses: “I think it

[SBAR] would be helpful because it is difficult for new nurses to get their priorities, let alone the sequence and physicians are very impatient with someone who is scattered” (RN4). Two nurses and two physicians agreed that a trusted, collaborative relationship was a factor in deciding how to give and receive the *Recommendation*.

RQ1: Did the Implementation of SBAR, Used in the ICU as Nurses Reported Patient Changes and Needs To Physicians, Result in Improved Collaboration between the Unit Physicians and Nurses as Measured by the Collaborative Practice Scales and the Individual Subscales of the Physician and Nurse Scales?

To address RQ1, the researcher discusses the findings generated by nurse and physician scores on the Collaborative Practice Scale (CPS). Because nurse and physician Subscale 1 and Subscale 2 scores comprised respective CPS composite scores, she addresses subscale scores rather than the composite scores. Considering the physician scores first, she relates (a) the RQ1 discussion, (b) pertinent literature, and (c) both professions’ responses to selected CPS items featured in the first Interview Protocol question (IP1).

Physician Subscale 1: Consensus Development with Nurses Regarding Mutual Responsibilities

The researcher discusses the physician findings, which are credible. Neither of the two CPS *physician* subscale scores significantly changed over the SBAR implementation (Time 1, Time 2, or Time 3). The following CPS survey items constituted the *Physician Subscale 1: Consensus Development with Nurses Regarding Mutual Responsibilities*:

(a) I discuss areas of agreement and disagreement with nurses in an effort to develop mutually agreeable health care goals; (b) I discuss with nurses the degree to which I think they should be involved in planning and implementing aspects of patient care; (c) I work toward consensus with nurses regarding best approach in caring for patients; (d) I discuss with nurses their expectations regarding the degree of their involvement in the health care decision-making process; and (e) I acknowledge to nurses those aspects of health care where they have more expertise than I do. (S. Weiss, 1983)

The RQ3 interviews and discussion of little nurse input and lack of physician-nurse consensus supported score stability in Physician Subscale 1. When the researcher interviewed physicians, the physicians posited that little change had occurred with the SBAR implementation. Few physician comments described the consensus development with nurses regarding mutual responsibilities. The researcher asked the physicians to comment on the relevancy, appropriateness, and importance of “coming to consensus or agreement with the nurses on the best way to approach care for a particular patient.”

Some responses did not depict consensus or mutual agreement: “You have to make sure your thoughts are properly placed in front of them The nurse must understand that before she executes” (MD1) and “Obviously, the main thing is going to be initiated by the physician. He is the driver of the bus. The nurse role is supportive” (MD6).

Other physicians alluded to a semblance of a process to mutually agree but not to the degree of directness described in the CPS Physician Subscale 1 items. One physician related a process of input to consensus:

We ask the advice of the nurses and then we come up with a plan so I guess in some sense that is asking for consensus on what to do. The nurse will be like this, this and this. And that will change how you do something or how you alter your treatment plan. I think that it [making decisions] is more the first one

[gaining nurse input]. I mean it is hard to set a percentage but I think the overall process works more along that line. (MD7)

Another alluded to watching nurse nonverbal feedback about the patient's treatment plan:

This [reaching consensus] is not always possible, but certainly, you always want to be on the same team with the same goal. I do this in the sense that when I talk about a patient with a nurse about what we are going to do today and I look at how they are reacting to this treatment plan. Sometimes you notice hesitance. If I see hesitance, I address it, I would ask is that okay or do you have something else that you are thinking. It is a gut feeling when someone understood what you are saying and if they are on the same page or not. (MD5)

Physician Subscale 2: Acknowledgment of the Nurse's Contribution To Patient Care

The researcher also accepted the results of Subscale 2, which was comprised of the following items.

(a) I reinforce the value of nursing care when talking to the patient; (b) I ask for the nurse's assessment of what may be needed to strengthen the patient's support system; (c) I discuss with similarities and differences in medical and nursing approaches to care; (d) I consider nurses' opinions when developing a treatment plan; and (e) I clarify whether the nurse or I will have the responsibility for discussing different kinds of information. (Weiss, 1983)

If a significant improvement in *Physician Subscale 2: acknowledgment of the nurse's contribution* had occurred, the researcher would have considered it questionable. The lack of improvement is plausible because the implementation of SBAR, designed to standardize, organize, and give more nursing input to the physician, did not address acknowledgment of nurse contributions.

Perhaps Physician Subscale 2 scores might have significantly increased if an extensive education intervention had preceded the SBAR implementation. Boyle and Kochinda (2004) described such a collaborative communication intervention which featured: (a) 23 hours of communication skills of training which occurred over an eight-month period; (b) six modules from a national training company on leadership, communication core skills, conflict resolution, change strategies, teams, and trust;

(c) ongoing role-playing among the clinical leaders, and (d) continuing assessment, feedback, and reinforcement. The staff nurses and physicians reported significantly increased collaborative communication post intervention and significantly improved perceptions of problem solving between groups and nursing leadership.

Nurse Subscale 1: Direct Assertiveness of Professional Expertise/Opinion

Nurses perceived that the Nurse Subscale 1: *direct assertiveness of professional expertise/opinion* and the Nurse Subscale 2: *active clarification of mutual responsibilities* had improved significantly after SBAR was implemented. The researcher agreed with the Nurse Subscale 1 scores but is puzzled by those of Nurse Subscale 2. The survey items measured in Nurse Subscale 1 included:

(a) I clarify the scope of my professional expertise when it is greater than the physician thinks that it is; (b) I suggest to physicians patient care approaches that I think would be useful; (c) I tell physicians when, in my judgment, their orders seem inappropriate; (d) I tell physicians of any difficulties I foresee in the patient's ability to deal with certain treatment options and their consequences. (S. Weiss, 1983)

The nurses responded that they regularly practiced three behaviors measured in Nurse Subscale 1 and addressed in the interviews: "Telling physicians that their orders seem inappropriate, suggesting a physicians approach to patient care that you felt are useful, and giving your assessment of difficulties related to the patient's ability to deal with a treatment or its consequences." Even when uncomfortable with questioning or giving input to a physician, most, if not all nurses due to their strong patient safety and patient commitment, would continue. One nurse expressed this commitment: "If this is something that I understand is important to the patient, I do not care if I am comfortable or not, I do not mind calling the physicians" (RN4).

Half of the interviewed nurses agreed that SBAR had been a positive change to their reports (four experienced nurses said that they already were performing SBAR elements prior to the implementation). The researcher speculates that the hospital sponsored implementation of SBAR with its assertive *Recommendation* statement served as an administration mandate for nurses to assert their professional opinions. This four-month implementation period might have increased their confidence and awareness to build on the behaviors measured in Subscale 1.

Nurse Subscale 2: Active Clarification of Mutual Responsibilities

The behaviors featured in the survey items CPS Nurse Subscale 2: *active clarification of mutual responsibilities*, while perhaps acceptable in a collaborative nurse-physician relationship, generally were not acceptable in the Community Hospital culture. Such assertive behaviors measured in the survey included:

(a) I ask physicians about their expectations regarding the degree of my involvement in the health care decision-making process, (b) I negotiate with the physician to establish our responsibilities for discussing different kinds of information with patients, (c) I discuss with physicians the degree to which I want to be involved in planning and implementing aspects of patient care, and (d) I discuss with physicians areas of practice that reside more within the realm of medicine than nursing, and (e) I inform physicians about areas of practice which are unique to nursing. (S. Weiss, 1983)

In the nurse interviews, the researcher elicited comments on only one of the five Nurse Subscale 2 items: “Have you ever told this physician that your area of professional expertise is greater than he/she thinks it is or had to clarify your area of expertise?” No nurse said that they had clarified in such a way or that such a response was appropriate. Other Nurse Subscale 2 items measure more assertive nurse behaviors than those which the researcher heard were permissible or practiced in this culture. These non-permissible

practices included: “I negotiate with the physician to establish our responsibilities . . . and I discuss with physicians areas of practice that reside more within the realm of medicine than nursing.” Because the researcher does not perceive that nurses practiced Subscale 2 behaviors before, during, or after the SBAR implementation, she finds Nurse Subscale 2 results puzzling.

RQ2: Did the Implementation of SBAR, Used in the ICU as Nurses Reported Patient Changes and Needs To Physicians, Result in Improved Communication Elements of (a) Openness, (b) Accuracy, and (c) Understanding between the Unit Physicians and Nurses as Measured by Selected Scales of the ICU Nurse-Physician Questionnaire?

The researcher accepts as credible the RQ2 findings of the communication elements of openness, accuracy, and understanding of ICU Nurse-Physician Questionnaire (ICU N-P Q) because much of the interview data confirmed the survey results. The researcher solicited data by asking interviewed nurses and physicians to answer the following questions from the ICU N-P Q. She presents IP2 interview responses relevant to the communication elements : *How Has the Adoption of SBAR Affected (a) the Understanding That Occurs Between You and Nurses (Physicians) (ICU N-P Q, 6); (b) the Openness Between You and Nurses (Physicians) (ICU N-P Q) and the Accuracy between You and Nurses (Physicians).*

Communication Element of Openness

On the *openness* element, the physicians scored significantly higher than nurses at Time 1 but not at other times; no significant effect of time for either nurses or physicians was identified. The *openness* element, assessed by four Likert-type items, was defined as the extent to which nurses and physicians could express what they meant without fear of

negative reactions or conflict. (Appendix K includes the Between-group Communication Scales and Component Questions of The ICU Physician-Nurse Questionnaire.)

The nurse interview results confirmed the survey results. When asked if SBAR had affected communication or relationships with physicians, the nurses reported that their new report delivery reduced physician frustration with long, incomplete, and poorly organized information in emergent situations, but this reduced frustration was not related to *openness*. When asked if SBAR had affected *openness* between nurses and physicians, seven interviewed nurses submitted that the *openness* between physicians and nurses had not changed since SBAR implementation. The stories of nurse discomfort in questioning an order and encounters with some physicians and both physician and nurse negative responses toward the SBAR *Recommendation* also support the nurse findings of no effect in *openness*.

The effect of physicians scoring higher than nurses on the same communication and collaboration scales has been documented as a pattern. In her case study to assess perceptions of nurse-physician collaboration, Miller (2001) administered to all unit nurses and physicians an adaptation of ICU Nurse-Physician Questionnaire with selected scales measuring physician leadership, communication openness within groups, communication openness between groups, communication timeliness, communication satisfaction, problem solving within groups, and problem solving between groups. Physicians scored significantly higher than nurses on every measure except physician leadership and openness within groups.

King and Lee (1994) reported a similar finding in a correlative study to examine the difference in perceived use of collaborative practice by Navy nurses and physicians in

the ICU. They reported that the Collaborative Behavior Scales analysis demonstrated that Navy physicians, similar to their civilian counterparts (Baggs et al., 1999; Thomas et al., 2003), assessed that significantly greater collaboration existed in their units than did nurses.

Physician interview responses, considering the effect of SBAR on the communication elements, were in accordance with their respective scores. Only one physician asserted that SBAR had affected *openness* between physicians and nurses. While three physicians maintained that their relationships with ICU nurses prior to SBAR had been open, two physicians posited that the ICU nurses had not thoroughly adopted SBAR.

Communication Element of Accuracy

The three-item *accuracy* scale measured the degree to which nurses and physicians trusted the correctness of the information given to them by the other party (Appendix K includes the Between-group Communication Scales and Component Questions of The ICU Physician-Nurse Questionnaire). No significant effects for *accuracy* were reported for either nurses or physicians. The researcher deems that this finding is plausible because the purpose of SBAR was not to improve information accuracy. SBAR was implemented not because the information was incorrect but because the report information was neither organized, succinct, standardized nor complete.

In interviews, nurses were not asked about the SBAR effects on *accuracy*. All interviewed physicians, however, agreed that as a result of SBAR implementation,

accuracy had not changed. MD9, who too believed that the accuracy was unchanged, surmised that he now received more information with SBAR.

Communication Element of Understanding

The eight-item *understanding* scale measured the degree to which nurses and physicians believed that the communication with each other was comprehensive and effective (Appendix K includes the Between-group Communication Scales and Component Questions of The ICU Physician-Nurse Questionnaire). On the *understanding* element, nurse scores improved significantly between Times 1 and 2 and between Times 1 and 3; physician scores showed no significant effect related to time. When compared with nurse scores, physicians scored significantly higher than nurses at Time 1 but not at other times. The researcher interpreted that the significantly higher physician scores at Time 1 as illustrating the pattern of higher physician scores.

Half of the interviewed nurses opined that SBAR improved the *understanding* between nurses and physicians. RN 7 clarified that improvement emanated from SBAR predictability: “I would say [yes] because they know what to expect from you and you know what they expect. If you use the tool in that way, each side knows what to expect from the other one.” Three nurses did not think that it had affected the understanding between nurses and physicians. Some perceived that they were already giving this information before SBAR implementation.

The physician *understanding* element scores were supported by the interview data: Eight physicians submitted that SBAR had not made a difference in understanding between nurses and physicians. Three of these physicians had been satisfied with the ICU nurse communication prior to the SBAR implementation. One physician questioned

whether the nurses always used the SBAR protocol. MD9 affirmed that SBAR increased *understanding* by standardizing the report: “It makes them think about what they are going to say and it makes them think about what should be the next thing that we are going to do. So it is good for everybody.”

Limitations of the Study

The study had several limitations: sample size, instrument selection, and interview trustworthiness. The researcher invited 48 physicians to participate in the study ($n = 48$); the scores of 30 physicians, who completed all three surveys, were included in the study data. The response rate was 62.50%. The researcher invited 46 nurses to participate; 28 nurses completed all three surveys. This response rate was 60.87%. These responses, less than 100% response rate, may limit the external and internal validity of the findings and thus, the findings may need to be interpreted cautiously.

The selection of the Collaborative Practice Scales was questionable for two reasons. Because the nurse subscales evaluated different concepts with disparate number of items than the physician subscales, the researcher could not complete a between-group analysis. This between-group analysis would have afforded additional perspectives on collaborative effects and comparison of physician and nurse views.

The researcher conjectures that the CPS measures such evolved collaborative behaviors as physician development of consensus and nurse clarification of mutual responsibilities. The instrument, however, does not measure fundamental collaborative behaviors present in IOM’s behavioral definition of collaboration: “(a) shared understanding of goals and roles; (b) effective communication, characterized by . . . open

and inclusive discussion and active listening; (c) attitudes of inclusiveness, openness, and acceptance of a member's ideas and opinions" (p. 214). Perhaps a more fundamental measure of collaboration would have presented additional useful information about collaboration as it existed at Community Hospital.

The constant comparative analysis of RQ3 was abbreviated from the original study design. Community Hospital conducted the SBAR implementation as a pilot for implementing SBAR throughout the hospital. The nurse executive requested a summary of RQ3 results for decisions related to the housewide implementation. After reading the summary and conferring with the researcher, she decided to cease the SBAR use in the ICU and delay the house wide implementation until more fundamental work was completed to encourage and sustain nurse-physician collaboration. Because of this cessation, the researcher could not continue physician interviews and subsequent checking with both nurses and physicians. Many questions and issues remain unexplored; resolution would have yielded a richer understanding of the Community Hospital culture and nurse and physician attitudes toward collaboration and communication related to SBAR implementation.

Implications of the Study

The study has implications for policy makers, practitioners and researchers.

Policy Makers

Several national organizations, including The Institute of Medicine, Society of Critical Care Medicine, and the American Association of Critical Care Nurses, have advocated for increasing interdisciplinary collaboration to increase healthcare quality and

patient safety. To change such longstanding professional hierarchical culture will require tension for change from several entities simultaneously. To promote interdisciplinary collaborative cultural change, healthcare regulatory agencies (i.e., Joint Commission Association of Healthcare Organization, a hospital accrediting agency) and reimbursement entities might reinforce collaboration through standards and requirements.

Practitioners

Medical school and nursing school administrators might consider designing joint nurse-physician courses where the students consider the medical system hierarchy, communication and collaboration among healthcare professionals, and the relationship of these topics to patient health outcomes and patient safety. Taught with simulation and subsequent feedback, the course should use actual scenarios of communication and collaboration failures. Before suggesting a joint course, RN2 questioned why nearly all hospital sponsored courses were separate for physicians and nurses.

Change agents, including nurse executives, medical staff officers, and organizational development professionals, might consider completing at least five interviews, similar to those in RQ3, to understand subtle culture mores prior to planning any implementation.

Researchers

The populations of nurses and physicians were different in several demographic variables: (a) gender, (b) citizenship status, and (c) years of education. This research has identified other research topics: the role of gender, ethnicity, and education in nurse-physician collaboration. Questions related to these topics include: (a) What strategies

would bridge these nurse and physician differences?; (b) What is the role of ethnicity in nurse-physician collaboration?; and (c) A study replication in a culture of predominantly female physicians.

Research with physicians is truly challenging because of their time pressures: for example, after several interview cancellations, a physician came to the interview on his day off and was interrupted five times by unit cell phone calls. These stressful conditions perhaps contributed to the physicians being less reflective and loquacious in answering the questions than the nurses.

Developing three data collection points (Time 1, Time 2, and Time 3) decreased the sample size. Some nurses and physicians tired after the second survey administration and opted not to complete the third. By not completing a survey, the participant was removed from the sample, and the sample size decreased. Two data collection points would have been preferable.

When conducting research within a hierarchical culture, the researcher should be sensitive to fear, which may not be addressed until midway in the study after trust between researcher and participants has been established. The researcher learned that several experienced nurses did not participate because of a prior organization breach of anonymity.

Conclusion

Community Hospital was not ready for SBAR with its assertive *Recommendation* which might have fostered collaboration. Neither nurses nor physicians preferred the SBAR *Recommendation* statement. Nurses expressed that SBAR with a question

Recommendation was a positive tool, which should be implemented for new nurses.

While collaboration and communication as measured on selected instruments significantly improved for nurses, they did not improve for physicians. RQ3 was the most informative question: providing a context for survey interpretation and clarifying attitudes toward SBAR.

REFERENCES

- Babbie, E. (1990). *Survey research methods* (2nd ed.). Belmont, CA: Wadsworth Publishing Company.
- Baggs, J. G., Schmitt, M. H., Mushlin, A.I., Mitchell, P. H., Eldredge, D. H., Oakes, D., et al. (1999). Association between nurse-physician collaboration and patient outcomes in three intensive care units. *Critical Care Medicine*, 27(9), 1991-1998.
- Baggs, J. G., & Ryan, S.A. (1990). ICU nurse-physician collaboration & nursing satisfaction. *Nursing Economic\$,* 8, 386-392.
- Baker, D. P., Salas, E., King, H., Battles, P., & Barach, P. (2005). The role of teamwork in the professional education of physicians: Current status and assessment recommendations. *Joint Commission Journal on Quality and Safety*, 31, 185-202.
- Barden, C. (Ed). (2005). AACN standards for establishing and sustaining healthy work environments.
- Berwick, D., & Nolan T. (2003). High Reliability Healthcare Organizations. Retrieved December 8, 2006, from <http://www.ihl.org/IHI/Topics/Reliability/ReliabilityGeneral/EmergingContent/HighReliabilityHealthCarePresentation.htm>
- Boyle, D. K., & Kochinda, C. (2004). Enhancing collaborative communication of nurse and physician leadership in two intensive care units. *Journal of Nursing Administration*, 34, 60-70.
- Brilli, R. J., Spevetz, A., Branson, R. D., Campbell, G. M., Cohen, H., Dasta, J. F., et al. (2001). Critical care delivery in the intensive care unit: Defining clinical roles and the best practice model. *Critical Care Medicine*, 29, 2007-2019.
- Building a Better Health Care System; Specifications for Reform.* (2004). Retrieved April 1, 2006, from www.nchc.org
- Byrum, M. S. (2007). Interview. In J. Gerard (Ed.). Elizabethtown, KY.
- Clemmer, T. P., Spuhler, V. J., Oniki, T. A., & Horn, S. D. (1999). Results of a collaborative quality improvement program on outcomes and costs in a tertiary critical care unit. *Critical Care Medicine*, 27, 1768-1775.

- Cohen, M. M., Kimmel, N. L., Benage, M. K., Hoang, C. C., Burroughs, T. E., & Roth, C. A. (2004). Implementing a hospital wide patient safety program for cultural change. *Joint Commission Journal on Quality and Safety*, 30, 424-430.
- Committee on Quality Health Care in America, I. O. M. (2000). *To err is human; building a safer health system*. Retrieved April 14, 2006, 2006, from <http://darwin.nap.edu/openbook/0309068371/gifmid/R1.gif>
- Committee on Quality Health Care in America, I. O. M. (2001). *Crossing the quality chasm: A new health system for the 21st century*. Washington, DC: National Academy Press.
- Committee on the Work Environment for Nurses and Patient Safety, I. O. M. (2004). *Keeping patient safe; transforming the work environment of nurses*. Washington, DC: National Academy Press.
- Coombs, M. (2003). Power and conflict in intensive care clinical decision making. *Intensive and Critical Care Nursing*, 19, 125-135.
- Davidson, A. L., Schofield, J., & Stocks, J. (2001). Professional cultures and collaborative efforts: A case study of technologists and educators working for change. *The Information Society*, 17, 21-32.
- Definition of Hospitalist*. (2007a, 2007). Retrieved from <http://www.medterms.com/script/main/art.asp?articlekey=8384>
- Definition of Intensivist*. (2007b). Retrieved March 20, 2007, from <http://www.medterms.com/script/main/art.asp?articlekey=23392>
- Definition of Nurse Practitioner*. (2007c, 2007). Retrieved March 20, 2007, from <http://www.medterms.com/script/main/art.asp?articlekey=11754>
- Dodek, P. M., & Raboud, J. (2003). Explicit approach to rounds in an ICU improves communication and satisfaction of providers. *Intensive Care Medicine*, 29, 1584-1588.
- Dougherty, M. B., & Larson, E. (2005). A review of instruments measuring nurse-physician collaboration. *Journal of Nursing Administration*, 35(3) 244-254.
- Friedman, D. M., & Berger, D. (2004). Improving team structure and communication: A key to hospital efficiency. *Archives of Surgery*, 139, 1194-1198.
- Fulop, N., Protopsaltis, G., King, A., Allen, P., Hutchings, A., & Normand, C. (2005). Changing organizations: A study of the context and processes for mergers of health care providers in England. *Social Science & Medicine*, 60, 119-130.

- Cohen, M. M., Kimmel, N. L., Benage, M. K., Hoang, C. C., Burroughs, T. E., & Roth, C. A. (2004). Implementing a hospital wide patient safety program for cultural change. *Joint Commission Journal on Quality and Safety*, 30, 424-430.
- Committee on Quality Health Care in America, I. O. M. (2000). *To err is human; building a safer health system*. Retrieved April 14, 2006, 2006, from <http://darwin.nap.edu/openbook/0309068371/gifmid/R1.gif>
- Committee on Quality Health Care in America, I. O. M. (2001). *Crossing the quality chasm: A new health system for the 21st century*. Washington, DC: National Academy Press.
- Committee on the Work Environment for Nurses and Patient Safety, I. O. M. (2004). *Keeping patient safe; transforming the work environment of nurses*. Washington, DC: National Academy Press.
- Coombs, M. (2003). Power and conflict in intensive care clinical decision making. *Intensive and Critical Care Nursing*, 19, 125-135.
- Davidson, A. L., Schofield, J., & Stocks, J. (2001). Professional cultures and collaborative efforts: A case study of technologists and educators working for change. *The Information Society*, 17, 21-32.
- Definition of Hospitalist*. (2007a, 2007). Retrieved from <http://www.medterms.com/script/main/art.asp?articlekey=8384>
- Definition of Intensivist*. (2007b). Retrieved March 20, 2007, from <http://www.medterms.com/script/main/art.asp?articlekey=23392>
- Definition of Nurse Practitioner*. (2007c, 2007). Retrieved March 20, 2007, from <http://www.medterms.com/script/main/art.asp?articlekey=11754>
- Dodek, P. M., & Raboud, J. (2003). Explicit approach to rounds in an ICU improves communication and satisfaction of providers. *Intensive Care Medicine*, 29, 1584-1588.
- Dougherty, M. B., & Larson, E. (2005). A review of instruments measuring nurse-physician collaboration. *Journal of Nursing Administration*, 35(3) 244-254.
- Friedman, D. M., & Berger, D. (2004). Improving team structure and communication: A key to hospital efficiency. *Archives of Surgery*, 139, 1194-1198.
- Fulop, N., Protopsaltis, G., King, A., Allen, P., Hutchings, A., & Normand, C. (2005). Changing organizations: A study of the context and processes for mergers of health care providers in England. *Social Science & Medicine*, 60, 119-130.

- Gabel, J., & Fitzner, K. (2003). New evidence to explain rising healthcare costs. *The American Journal of Managed Care*, 9(Special Issue 1), SP1-SP2.
- Gifford, B. D., Zammuto, R. F., & Goodman, E.A. (2002). Hospital unit culture and nurses' quality of work life. *Journal of Healthcare Management*, 47(1), 13-25.
- Guise, J. M., & Lowe, N.K. (2006). Do you speak SBAR? *Journal of Obstetrical Gynecological Neonatal Nursing*, 3, 313-314.
- Haig, K. M., Sutton, S., & Whittington, J. (2006). SBAR: A shared mental model for improving communication between clinicians. *Joint Commission Journal on Quality and Safety*, 32, 167-175.
- Henneman, E. A., Lee, J. L., & Cohen, J. I. (1995). Collaboration: A concept analysis. *Journal of Advanced Nursing*, 21, 103-109.
- Ingersoll, G. L., Fisher, M., Ross, B., Soja, M., & Kidd, N. (2001). Employee response to major organizational redesign. *Applied Nursing Research*, 14(1), 18-28.
- Ingersoll, G. L., Kirsch, J. C, Merk, S. E., & Lightfoot, J. (2000). Relationship of organizational culture and readiness for change to employee. *Journal of Nursing Administration*, 30, 11-20.
- Ingersoll, G. L., Wagner, L., Sonn, E. M., Kirsch, J. C., Hepworth, J. T., & Williams, M. (2002). Patient-focused redesign and employee perception of work environment. *Nursing Economic\$,* 20(4), 163-187.
- Jain, M., Miller, L., Belt, D., & Berwick, D. M. (2006). Decline in ICU adverse events, nosocomial infections and cost through a quality improvement initiative focusing on teamwork and culture change. *Quality and Safety in Health Care*, 15, 235-239.
- Joint Commission. http://jointcommission.org/AboutUs/joint_commission_facts.htm. Facts about The Joint Commission accessed October 21, 2007.
- Jones, J. M. (2003). Dual or dueling culture and commitment. *Journal of Nursing Administration*, 30(4), 235-242.
- Jones, K. R., DeBaca, V., & Yarbrough, M. (1997). Organizational culture assessment before and after implementing patient-focused care. *Nursing Economic\$,* 15(2), 73-80.
- Jones, K. R., & Redman, R.W. (2000). Organizational culture and work redesign. *Journal of Nursing Administration*, 30(12), 604-610.

- Keppel, G. (1991). *Design and analysis: A researcher's handbook*. Upper Saddle River, NJ: Prentice Hall.
- King, L., & Lee, J.L. (1994). Perceptions of collaborative practice between Navy nurses and physicians in the ICU setting. *American Journal of Critical Care*, 3, 331-336.
- Knaus, W. A., Draper, E. A., Wagner, D. P., & Zimmerman, J. E. (1986). An evaluation of outcome from intensive care in major medical centers. *Annals of Internal Medicine*, 104, 410-418.
- Kosnick, L. K. (2002). The new paradigm of crew resource management: Just what is needed to reengage the stalled collaborative movement. *Joint Commission Journal on Quality Improvement*, 28, 235-241.
- Langan-Fox, J., & Tan, P. (1997). Images of a culture in transition: Personal constructs of organizational stability and change. *Journal of Occupational and Organizational Psychology*, 70, 273-293.
- Larson, E., Hamilton, H. E., Mitchell, K., & Eisenberg, J. (1998). Hospital talk: An exploratory study to assess what is said and what is heard between physicians and Nurses. *Clinical Performance and Quality Health Care*, 6, 183-189.
- Leonard, M., Graham, S., & Bonacum, D. (2004, Oct.). The human factor: The critical importance of effective teamwork and communication in providing safe care. *Quality and Safety in Health Care*, 13(Suppl. 1), i85-i90.
- Makary, M. A., Holzmueller, C. G., Thomson, D., Rowen, L., Heitmiller, E. S., & Maley, W. R. (2006). Operating room briefings: Working on the same page. *Joint Commission Journal on Quality and Safety*, 32, 351-354.
- Marshall, M. N., Mannion, R., Nelson, E., & Davis, H. T. (2003). Managing change in the culture of general practice: Qualitative case studies in primary care trust. *British Medical Journal*, 327, 599-602.
- McCarthy, D., & Blumenthal, D. (2006). Stories from the sharp end: Case studies in safety improvement. *The Milbank Quarterly*, 84, 165-200.
- Melia, K. M. (2001). Ethical issues and the importance of consensus for the intensive care team. *Social Science & Medicine*, 53, 707-719.
- Meterko, M., Mohr, D. C., & Young, G. J. (2004). Teamwork culture and patient satisfaction in hospitals. *Medical Care*, 42(5), 492-498.
- Miles, M. R., & Huberman, M. A. (1994). *Qualitative data analysis* (2nd ed.). Thousand Oaks, CA: Sage Publications.

- Miller, P. A. (2001). Nurse-physician collaboration in an intensive care unit. *American Journal of Critical Care, 10*, 341-350.
- More About the Institute of Medicine Web site.* (2006). Retrieved April 14, 2001, 2006, from <http://www.iom.edu/CMS/3239/4091.aspx>
- Mowday, R. T., Steers, R. M., & Porter, L. W. (1979). The measurement of organizational commitment. *Journal of Vocational Behavior, 14*, 224-247.
- Murphy, K. (2006). What pilots can teach hospitals about patient safety. *New York Times*.
- Narasimhan, M., Eisen, L. A., Mahoney, C. D., Acerra, F. L., & Rosen, M. J. (2006). Improving nurse-physician communication and satisfaction in the intensive care unit with a daily goals worksheet. *American Journal of Critical Care, 15*, 217-222.
- National Committee for Quality Healthcare. (2006). *CEO survival guide to pay for performance, 2006 Edition*. Retrieved June 2, 2007, from <http://www.ncqhc.org/executiveinstitute/performance.cfm>.
- Nelson, E. C., Batalden, P. B., Huber, T. P., Mohr, J. J., Godfrey, M. M., Headrick, L.A., et al. (2002). Microsystems in health care: Learning from high-performing front-line clinical units. *Joint Commission on Quality Improvement, 28*, 472-493.
- Nystrom, P. C. (1993). Organizational cultures, strategies, and commitments in health care organizations. *Health Care Management Review, 18*(1), 43-49.
- Ohlinger, J., Brown, M. S., Laudert, S., Swanson, S., & Fofah, O. (2003). Development of potentially better practices for the neonatal intensive care unit as a culture of collaboration: Communication, accountability, respect, and empowerment. *PEDIATRICS, III*, 471-476.
- O'Reilly, C. A., Chatman, J., & Caldwell, D. F. (1991). People and organizational culture: A profile comparison approach to assessing person-organization fit. *Academy of Management Journal, 34*, 487-513.
- Parker, V. A., Wubbenhorse, W. H., Young, G. J., Desai, K. R., & Charns, M. P. (1999). Implementing quality improvement in hospitals: The role of leadership and culture. *American Journal of Medical Quality, 14*(1), 64-69.
- Press Ganey Inpatient Survey Psychometrics.* (2006). South Bend, IN: Press Ganey Associates, Inc.

- Pronovost, P., Berenholtz, S., Dorman, T., Lipsett, P. A., Simmonds, T., & Haraden, C. (2003). Improving communication in the ICU using daily goals. *Journal of Critical Care, 18*, 71-75.
- Randolph, A. G., & Pronovost, P. (2002). Reorganizing the delivery of intensive care could improve efficiency and save lives. *Journal of Evaluation in Clinical Practice, 8*, 1-8.
- Rizzo, J. A., Gilman, M. P., & Mersmann, C. A. (1994). Facilitating care delivery redesign using measures of unit culture and work characteristics. *Journal of Nursing Administration, 24*(5), 32-37.
- Rogers, E. M. (1995). *Diffusion of innovations* (4th ed.). New York: The Free Press.
- Rondeau, K. V., & Wagar, T.H. (1998). Hospital chief executive officer perceptions of organizational culture and performance. *Hospital Topics, 76*, 1-10.
- Rousseau, D. M. (1990). Normative beliefs in fundraising organizations. *Group & Organizational Studies, 15*, 448-460.
- Salant, P., & Dillman, D. A. (1994). *How to conduct your own survey*. New York: John Wiley & Sons.
- Schein, E. H. (1986). *Organizational culture and leadership*. London: Jossey-Bass Publishers.
- Schoen, C., Osborn, R., Trang Huynh, P., Doty, M., Zapert, K., Peugh, J., & Davis, K. (2005). Taking the pulse of health care systems: Experiences of patients with health problems in six countries. *Health Affairs, 509-521*.
- Seago, J. A. (1996). Work group culture, stress, and hostility. *Journal of Nursing Administration, 26*(6), 39-47.
- Sherwood, G., Thomas, E., Bennett, D. S., & Lewis. (2002). A teamwork model to promote patient safety in critical care. *Critical Care Nursing Clinics of North America, 14*, 333-340.
- Shortell, S. M., Gillies, R. R., & Anderson, D. A. (1996). *Remaking health care in America: Building organized delivery systems*. San Francisco: Jossey-Bass Publishers.
- Shortell, S. M., Rousseau, D. M., Gillies, R. R., Devers, M. A., & Simons, T. L. (1991). Communication scales of the ICU Nurse-Physician Questionnaire. *Medical Care, 29*, 709-727.

- Shortell, S. M., Rousseau, D. M., Gillies, R. R., Devers, M. A., & Simons, T. L. (1991). Organizational assessment in intensive care units (ICUs): Construct development, reliability, and validity of the ICU nurse-physician questionnaire. *Medical Care, 29*, 709-727.
- Shortell, S. M., Zimmerman, J. E., Rousseau, D. M., Gillies, R. R., Wagner, D. P., Draper, E. A., et al. (1994). The performance of intensive care units: Does good management make a difference? *Medical Care, 5*, 508-525.
- Silvester, J., Anderson, N. R., & Patterson, F. (1999). Organizational culture change: An inter-group attributional analysis. *Journal of Occupational and Organizational Psychology, 72*(1-23).
- Smith, C. S., Francovich, C., & Gieselman, J. (2000). Pilot test of an organizational culture model in a medical setting. *Health Care Manager, 19*(2), 68-77.
- Thomas, E. J., Sexton, J. B., & Helmreich, R. L. (2003). Discrepant attitudes about teamwork among critical care nurses and physicians. *Critical Care Medicine, 31*, 956-959.
- Thompson, D., Holzmueller, C., Hunt, D., Cafeo, C., Sexton, B., & Pronovost, P. (2005). A morning briefing: Setting the stage for a clinically and operationally good day. *The Joint Commission Journal on Quality and Patient Safety, 31*(476-479).
- Tips for introducing SBAR in the OR. (2006). *OR Manager, 22*, 12.
- Traynor, M., & Wade, B. (1993). The development of a measure of job satisfaction for use in monitoring the morale of community nurses in four trusts. *Journal of Advanced Nursing, 18*, 127-136.
- Ulrich, B. T., Buerhaus, P. I., Donelan, K., Norman, L., & Dittus, R. (2005). How RNs view the work environment. *Journal of Nursing Administration, 35*, 389-396.
- Vazirani, S., Hays, R. D., Shapiro, M. F., & Cowan, M. (2005). Effect of a multidisciplinary intervention on communication and collaboration among physicians and nurses. *American Journal of Critical Care, 14*, 71-77.
- Welch, M., & Tulbert, B. (2000). Practitioners' perspectives of collaboration: A social validation and factor analysis. *Journal of Educational and Psychological Consultation, 11*, 357-378.
- Weiss, S. (1983). The Collaborative Practice Scales. Obtained directly from S. Weiss and used with her permission.
- Weiss, S. J., & Davis, H. P. (1985). Validity and reliability of the Collaborative Practice Scales. *Nursing Research, 34*, 299-305.

- Wheelan, S. A., Burchill, C. N., & Tilin, F. (2003). The link between teamwork and patients' outcomes in intensive care units. *American Journal of Critical Care*, 12(6), 527-534.
- Wilson, V. J., McCormack, B. G., & Ives, G. (2005). Understanding the workplace culture. *Journal of Advanced Nursing*, 50(27-38).
- Wooten, L. P., & Crane, P. (2003). Nurses as implementers of organizational culture. *Nursing Economic\$, 21*, 275-279.

APPENDIX A

COLLABORATIVE PRACTICE SCALE—N

© Weiss, 1983

1. I ask physicians about their expectations regarding the degree of my involvement in the health care decision-making process..

Never: _____ : _____ : _____ : _____ : _____ : _____ :Always

2. I negotiate with the physician to establish our responsibilities for discussing different kinds of information with patients.

Never: _____ : _____ : _____ : _____ : _____ : _____ :Always

3. I clarify the scope of my professional expertise when it is greater than the physician thinks it is.

Never: _____ : _____ : _____ : _____ : _____ : _____ :Always

4. I discuss with physicians the degree to which I want to be involved in planning and implementing aspects of patient care.

Never: _____ : _____ : _____ : _____ : _____ : _____ :Always

5. I suggest to physicians patient care approaches that I think would be useful.

Never: _____ : _____ : _____ : _____ : _____ : _____ :Always

6. I discuss with physicians areas of practice that reside more within the realm of medicine than nursing.

Never: _____ : _____ : _____ : _____ : _____ : _____ :Always

7. I tell physicians when, in my judgment, their orders seem inappropriate.

Never: _____ : _____ : _____ : _____ : _____ : _____ :Always

8. I tell physicians of any difficulties I foresee in the patient's ability to deal with certain treatment options and their consequences.

Never: _____ : _____ : _____ : _____ : _____ : _____ :Always

9. I inform physicians about areas of practice which are unique to nursing.

Never: _____ : _____ : _____ : _____ : _____ : _____ :Always

Note. The Collaborative Practice Scales copyright 1983 by S. Weiss and used with permission of S. Weiss.

APPENDIX B

COLLABORATIVE PRACTICE SCALE—P

© Weiss, 1983

1. I reinforce the value of nursing care when talking to the patient.

Never: _____ : _____ : _____ : _____ : _____ : _____ : Always

2. I ask for the nurse's assessment of what may be needed to strengthen the patient's support system

Never: _____ : _____ : _____ : _____ : _____ : _____ : Always

3. I discuss with nurses the similarities and differences in medical and nursing approaches to care.

Never: _____ : _____ : _____ : _____ : _____ : _____ : Always

4. I consider nurses' opinions when developing a treatment plan.

Never: _____ : _____ : _____ : _____ : _____ : _____ : Always

5. I discuss areas of agreement and disagreement with nurses in an effort to develop mutually agreeable health care goals.

Never: _____ : _____ : _____ : _____ : _____ : _____ : Always

6. I discuss with nurses the degree to which I think they should be involved in planning and implementing aspects of patient care.

Never: _____ : _____ : _____ : _____ : _____ : _____ : Always

7. I work toward consensus with nurses regarding the best approach in caring for patients.

Never: _____ : _____ : _____ : _____ : _____ : _____ : Always

8. I discuss with nurses their expectations regarding the degree of their involvement in the health care decision-making process.

Never: _____ : _____ : _____ : _____ : _____ : _____ : Always

9. I acknowledge to nurses those aspects of health care where they have more expertise than I do.

Never: _____ : _____ : _____ : _____ : _____ : _____ : Always

10. I clarify whether the nurse or I will have the responsibility for discussing different kinds of information with patients.

Never: _____ : _____ : _____ : _____ : _____ : _____ : Always

Note. The Collaborative Practice Scales copyright 1983 by S. Weiss and used with permission of S. Weiss.

APPENDIX C

BACKGROUND QUESTIONS FOR NURSES

Please check the appropriate blank for each question:

1. What is your gender:
 - a. Female
 - b. Male

2. In what year were you born? _____

3. Please check the **highest** level of education, which you have attained.
 - a. Associate Degree
 - b. Diploma RN
 - c. Baccalaureate Degree
 - d. Master's Degree
 - e. Beyond Master's Degree

4. Have you attained nursing professional certifications?
 - a. Yes
 - b. No

5. If yes, please list the certifications. _____

6. Which of the following applies? (Check one only.)
 - a. US native
 - b. US naturalized
 - c. Foreign national
 - d. Other

Note. Adapted with permission from the ICU Nurse-Physician Questionnaire (Shortell et al., 1991).

APPENDIX D
BACKGROUND QUESTIONS FOR PHYSICIANS

Please check the appropriate blank for each question:

1. What is your gender:
 - a. Female
 - b. Male

2. In what year were you born? _____

3. What is your medical department?
 - a. Anesthesia
 - b. Family Medicine
 - c. Internal Medicine
 - d. Surgery

4. Are you board certified in Family Medicine, Internal Medicine, or Surgery?
 - e. Yes
 - f. No

5. Please list any subspecialty. _____

6. Are you board certified in the subspecialty?
 - a. Yes
 - b. No

7. Which of the following applies? (Check one only.)
 - c. US native
 - d. US naturalized
 - e. Foreign national
 - f. Other

Note. Adapted with permission from the ICU Nurse-Physician Questionnaire (Shortell et al., 1991).

APPENDIX E

ICU NURSE-PHYSICIAN QUESTIONNAIRE—NURSE SCALE
 RELATIONSHIPS AND COMMUNICATIONS WITHIN THE ICU

For each of the following statements, please circle the number under the response that best reflects your judgment.

Statement

Statement	Strongly Disagree	Strongly Agree	Neither Disagree Nor Agree	Agree	Strongly Agree
1. I look forward to working with the physicians of this ICU each day.	1	2	3	4	5
2. It is easy for me to talk openly with the physicians of this ICU.	1	2	3	4	5
3. I can think of a number of times when I received incorrect information from physicians in this unit.	1	2	3	4	5
4. There is effective communication between nurses and physicians across all shifts.	1	2	3	4	5
5. Communication between nurses and physicians in this unit is very open.	1	2	3	4	5
6. It is often necessary for me to go back and check the accuracy of information I have received from physicians in this unit.	1	2	3	4	5
7. I find it enjoyable to talk with physicians of this unit.	1	2	3	4	5
8. Physicians associated with the unit are well informed regarding events occurring on other shifts.	1	2	3	4	5

	Strongly Disagree	Strongly Agree	Neither Disagree Nor Agree	Agree	Strongly Agree
9. It is easy to ask advice from physicians on this unit.	1	2	3	4	5
10. I feel that certain ICU physicians don't completely understand the information they receive.	1	2	3	4	5
<u>General Relationships and Communications.</u>					
11. Nurses have a good understanding of physician goals.	1	2	3	4	5
12. Physicians are readily available for consultation.	1	2	3	4	5
13. Nurses have a good understanding of physician's treatment plans.	1	2	3	4	5
14. Physicians have a good understanding of nursing objectives.	1	2	3	4	5
15. Nursing care plans are well understood by physicians.	1	2	3	4	5

Note. Communication Scales of the ICU Nurse-Physician Questionnaire used with permission (Shortell et al., 1991).

APPENDIX F

ICU NURSE-PHYSICIAN QUESTIONNAIRE—PHYSICIAN SCALE

RELATIONSHIPS AND COMMUNICATIONS WITHIN THE ICU

For each of the following statements, please circle the number under the response that best reflects your judgment.

Statement	Strongly Disagree	Strongly Agree	Neither Disagree Nor Agree	Agree	Strongly Agree
1. I look forward to working with the nurses of this ICU each day.	1	2	3	4	5
2. It is easy for me to talk openly with the nurses of this ICU.	1	2	3	4	5
3. I can think of a number of times when I received incorrect information from nurses in this unit.	1	2	3	4	5
4. There is effective communication between nurses and physicians across all shifts.	1	2	3	4	5
5. Communication between nurses and physicians in this unit is very open.	1	2	3	4	5
6. It is often necessary for me to go back and check the accuracy of information I have received from nurses in this unit.	1	2	3	4	5
7. I find it enjoyable to talk with nurses of this unit.	1	2	3	4	5
8. Nurses associated with the unit are well informed regarding events occurring on other shifts.	1	2	3	4	5
9. It is easy to ask advice form nurses on this unit.	1	2	3	4	5
10. I feel that certain ICU nurses don't completely understand the information they receive.	1	2	3	4	5

Statement	Strongly Disagree	Strongly Agree	Neither Disagree Nor Agree	Agree	Strongly Agree
<u>General Relationships and Communications.</u>					
11. Nurses have a good understanding of physician goals.	1	2	3	4	5
12. Physicians are readily available for consultation.	1	2	3	4	5
13. Nurses have a good understanding of physician's treatment plans.	1	2	3	4	5
14. Physicians have a good understanding of nursing objectives.	1	2	3	4	5
15. Nursing Care plans are well understood by Physicians.	1	2	3	4	5

Note. Communication Scales of the ICU Nurse-Physician Questionnaire used with permission (Shortell et al., 1991).

APPENDIX G

INTERVIEW QUESTIONS FOR NURSES

1. Please describe (a) a professional relationship with a physician that you considered collaborative and successful and (b) how that relationship affected patient care. Please comment on the relevancy, their importance, and appropriateness of the following actions to your story of collaborative nurse/physician care of the patient: (a) telling physicians when their orders seem inappropriate (CPS-N, 7); (b) suggest to physicians approaches to patient care that I think are useful (CPS-N, 5); (c) telling physicians my assessment of difficulties related to a patient's ability to deal with a treatment option and its consequences (CPS-N, 8); or (d) telling a physician that my area of professional expertise is greater than he thinks it is (CPS-N, 3).
2. How has the adoption of SBAR affected your communication or relationships with the physicians and patients? How has the adoption of SBAR affected (a) the understanding that occurs between you and physicians (ICU N-P Q, 6); (b) the openness between you and physicians (ICU N-P Q, 3); (c) the enjoyment of you talking with physicians (ICU N-P Q, 5,); and(d) the timeliness of information (ICU N-P Q, 10, 11,1 2, and 13)?

3. From a nurse's point of view, what are your feelings about making the *Recommendation* Phase of SBAR to a physician? What experiences have you had with physicians when you have made the *Recommendation*? How have you phrased the *Recommendation*?
4. As with any change, I am sure that you have made or heard remarks, told or heard stories, or heard or had conversations about SBAR and its implementation. Please share some of these to help us understand more fully the attitudes toward this communication tool.

(*Note:* The acronyms CPS-N and ICU N-P Q followed by numbers signify the relevant survey and its question number. These acronyms and numbers will not be used during the interview.)

APPENDIX H

INTERVIEW QUESTIONS FOR PHYSICIANS

1. Please (a) describe a professional relationship with a nurse that you considered collaborative and successful and (b) how that relationship affected patient care. Please comment on the relevancy, their importance, and appropriateness of the following actions to your story of collaborative nurse/physician care of the patient: (a) coming to consensus with nurses on the best way to approach care for a particular patient? (CPS-P, 7); (b) ask for nurse input into treatment plan development (CPS-P, 4); (c) ways to strengthen the patient's support system (CPS-P, 2); or (d) acknowledging to nurses the areas of healthcare where they have more expertise than I have (CPS-P, 9).
2. How has the adoption of SBAR affected (a) the understanding that occurs between you and nurses (ICU N-P Q, 6); (b) the openness between you and nurses (ICU N-P Q, 3); (c) the accuracy of information which you receive from nurses (ICU N-P Q, 2, 4,7); and (d) the timeliness of information (ICU N-P Q, 10, 11, 12, and 13)?
3. From a physician's point of view, what is the most acceptable verbiage for a nurse to use to make the *Recommendation*? What are your experiences or reactions to receiving the *Recommendation* phase of SBAR from a nurse?

4. As with any change, I am sure that you have made or heard remarks, told or heard stories, or heard or had conversations about SBAR and its implementation. Please share some of these to help us understand more fully the attitudes toward this communication tool.

(Note: The acronyms CPS-P and ICU N-P Q followed by numbers signify the relevant survey and its question number. These acronyms and numbers will not be used during the interview.)

APPENDIX I

THE FACTOR LOADINGS ON THE NURSE AND PHYSICIAN CPS SCALES

Nurse CPS items	Factor 1	Factor 2	Physician CPS items	Factor 1	Factor 2
1. I ask MDs about their expectations regarding the degree of my involvement in health care decisions.	-.23	.71	1. I reinforce the values of nursing care when talking to the patient.	-.10	.70
2. I negotiate with the MD to establish our responsibilities for discussing different kinds of information with patients.	.02	.59	2. I ask for the nurse's assessment of what may be needed to strengthen the patient's support system.	.03	.60
3. I clarify the scope of my professional expertise when it is greater than the MD thinks it is.	.51	.20	3. I discuss with nurses the similarities and differences in medical and nursing approaches to care.	.04	.59
4. I discuss with MDs the degree to which I want to be involved in planning aspects of patient care.	.14	.54	4. I consider nurses' opinions when developing a treatment plan.	.32	.48

Nurse CPS items	Factor 1	Factor 2	Physician CPS items	Factor 1	Factor 2
5. I suggest to MDs patient care approaches that I think would be useful.	.81	-.03	5. I discuss areas of agreement and disagreement with RNs in an effort to develop mutually agreeable health goals.	.68	-.01
6. I discuss with MDs areas of practice that reside more within the realm of medicine than nursing.	.19	.53	6. I discuss with RNs the degree to which I think they should be involved in planning and implementing patient care.	.58	.12
7. I tell MDs when, in my judgment, their orders seem inappropriate.	.55	.07	7. I work toward consensus with RNs regarding the best approach in caring for a patient.	.89	-.17
8. I tell MDs of any difficulties I foresee in the patient's ability to deal with treatment options and their consequences.	.81	-.09	8. I discuss with RNs their expectations regarding the degree of their involvement in the health care decision process.	.54	.20
9. I inform MDs about areas of practice that are unique to nursing.	.30	.53	9. I acknowledge to nurses those aspects of health care where they have more expertise than I do.	.42	.19

Nurse CPS items	Factor 1	Factor 2	Physician CPS items	Factor 1	Factor 2
			10. I clarify whether the nurse of I will have the responsibility for discussing different kinds of information with patients.	.14	.52

Note: From “Validity and Reliability of the Collaborative Practice Scales,” by S. J. Weiss and H. P. Davis, 1985. *Nursing Research*, 34, p. 300. Copyright 2000 by S. J. Weiss.

Adapted with permission of the author.

APPENDIX J

ERROR! SCORING FOR THE COLLABORATIVE PRACTICE SCALE

Sandra J. Weiss, PhD, DNSc
© copyright

The Collaborative Practice Scale for physicians consists of ten items which are divided into two factors of five items each. Each item is scored on a six point scale ranging from never to always (never = 1). Each factor has a maximum possible score of 30 with the total physician CPS having a maximum score of 60. Items #1, 2, 3, 4, and 10 constitute the first factor, measuring the degree to which a physician acknowledges the importance of nurses' unique contributions to different responsibilities in patient care. Items #5, 6, 7, 8, and 9 constitute the second factor, measuring the degree to which a physician seeks consensus with nurses regarding mutual responsibilities and patient care goals. The Collaborative Practice Scale for nurses consists of nine items with a possible score of 54. Each of its items is also scored on the same six-point scale. The nurse CPS also has two factors with one factor having a maximum score of 30 and the other 24. The first factor consists of items #1, 2, 4, 6, and 9 and measures the degree to which a nurse directly asserts professional expertise and opinion when interacting with physicians about patient care. The second factor consists of items #3, 5, 7, and 8, and measures the degree to which a nurse clarifies with physicians' mutual expectations regarding the nature of shared responsibilities in patient care. Higher scores imply greater use of collaborative

practice by the physician or nurse completing the scale based on self-report regarding interprofessional practices in patient care activities.

*Note*¹: Sandra J. Weiss, PhD, DNSc, author of the Collaborative Practice Scales sent this document with *Error* imbedded. The order of the Physician Factors were reversed in later publications.

APPENDIX K

BETWEEN-GROUP COMMUNICATION SCALES AND COMPONENT QUESTIONS OF THE ICU PHYSICIAN-NURSE QUESTIONNAIRE

*SOPENBG: Between-group Communication Openness

DEF: The degree to which physicians or nurses are able to "say what they mean"
 when speaking *with members of the other group*, without fear of
 repercussions or misunderstanding.

CITE: Roberts & O'Reilly (1974)

IOPNBG1 IT IS EASY FOR ME TO TALK OPENLY WITH THE [PHYSICIAN]S OF THIS ICU.

IOPNBG2 COMMUNICATION BETWEEN NURSES AND PHYSICIANS OF THIS UNIT IS
 VERY OPEN.

IOPNBG3 I FIND IT ENJOYABLE TO TALK WITH [PHYSICIAN]S OF THIS UNIT.

IOPNBG4 IT IS EASY TO ASK ADVICE FROM [PHYSICIAN]S IN THIS UNIT.

***SACCBG: Between-group Communication Accuracy**

DEF: The degree to which nurses [physicians] believe in the consistent accuracy of the information conveyed to them *by members of the other group*.

CITE: Roberts & O'Reilly (1974)

IACCBG1 I CAN THINK OF A NUMBER OF TIMES WHEN I RECEIVED INCORRECT INFORMATION FROM [PHYSICIAN] S IN THIS UNIT. (NEG)

IACCBG2 IT IS OFTEN NECESSARY FOR ME TO GO BACK AND CHECK THE ACCURACY OF INFORMATION I HAVE RECEIVED FROM [PHYSICIAN] S IN THIS UNIT. (NEG)

IACCBG5 I FEEL THAT CERTAIN ICU [PHYSICIAN] S DON'T COMPLETELY UNDERSTAND THE INFORMATION THEY RECEIVE. (NEG)

***SACCBG: Between-group (Nurse-Physician) Understanding**

DEF: The comprehensiveness and effectiveness of communication between nurses and physicians on this unit.

CITE: Northwestern

IRN1 NURSES HAVE A GOOD UNDERSTANDING OF PHYSICIAN GOALS.

IRN2 NURSES HAVE A GOOD UNDERSTANDING OF PHYSICIAN'S TREATMENT PLANS.

IMD1 PHYSICIANS ARE READILY AVAILABLE FOR CONSULTATION.

IMD2 PHYSICIANS HAVE A GOOD UNDERSTANDING OF NURSING OBJECTIVES.

IMD3 NURSING CARE PLANS ARE WELL UNDERSTOOD OBY PHYSICIANS IN THIS UNIT.

ISHCBG1 THERE IS EFFECTIVE COMMUNICATION BETWEEN NURSES AND PHYSICIANS ACROSS SHIFTS.

ISHCBG2 [PHYSICIANS] ASSOCIATED WITH THIS UNIT ARE WELL INFORMED
REGARDING EVENTS OCCURING ON OTHER SHIFTS.

ICOHBG1 I LOOK FORWARD TO WORKING WITH THE [PHYSICIAN]S OF THIS ICU
EACH DAY.

Note: Received from and used with permission of Stephen Shortell et al., 1991.

APPENDIX L

ADMINISTRATION PROTOCOL FOR THE CPS AND SELECTED SCALES THE ICU NURSE-PHYSICIAN QUESTIONNAIRE

Used the Initial Administration

PREPARATION: Survey Administrator arrives 15 minutes prior to agree upon administration time. She has all materials laid out face down. The order of pages follows: (a) University of Louisville consent preamble (b) Background Questions; (c) CPS scale appropriate to the population; and (d) the selected communication scales of the ICU Nurse-Physician Questionnaire.

INTRODUCTION: My name is Jackie Gerard; I will be administering three short surveys to you.

UNIVERSITY OF LOUISVILLE IRB CONSENT PROCESS: I will read the consent preamble approved by the University of Louisville Institutional Review Board.

ADMINISTRATION OF THE SURVEYS:

Please do not turn over the papers until I ask you to. Today we will ask you to think about approximately 30 questions and then complete these questions on three different surveys.

As you think about how to answer these questions, answer them ONLY in the context of the ICU and the time frame, which I will describe. When I say “in the context of the ICU,” if you often work on another floor, you want to limit your responses to your

attitudes about the critical care unit. In this setting that would include either/or or both CCU and ICU.

When I speak of the time frame, I want you to assess these questions on both surveys in the following timeframe: [(a) Prior to SBAR—Answer the questions as you have experienced relationships and the environment of the critical care unit for the past 6 months; (b) SBAR post one month—Answer the questions as you have experienced relationships and the environment of the critical care unit during the last month; and (c) 4 months after SBAR implementation commencement. Answer the questions as you have experienced relationships and the environment of the critical care unit during the last two months). Please be thoughtful about your responses.

INSTRUCTIONS: Please turn over your papers. The first survey is entitled The Collaborative Practice Scales. Note that there are eight (nine) questions on a six-point scale. The scale reads from the left *Never* over six spaces to *Always*. Put an X in the space that best describes the current way things are done in our critical care unit—either or both the ICU or the CCU. Be careful to not put your response on the word at each end or on the comma but in the space itself. The left three spaces will be a negative response and the last three will be a positive assessment.

Now, please look at the first page of the ICU Nurse-Physician Questionnaire. On this survey, you will not select your choice with an X, but you will circle the number with which you agree. Note that the scale is different with 5 responses, circling 1 signifies that you *strongly disagree*; 2 that you *disagree*; 3 that you *neither disagree nor agree*; 4 that you *agree* and 5 that you *strongly agree*.

What questions do you have?

When you have finished, please give me your surveys.

APPENDIX M

DEFINITION LIST FOR RQ3 INTERVIEWS

1. Collaboration is the teamwork of physicians and nurses and is characterized by their “working and communicating cooperatively together, sharing responsibility for problem-solving and decision making, and planning and implementing plans for patient care (as cited in Baggs & Ryan, 1990, p. 387).
2. Communication is the process of one person making common with another what he is thinking.
3. Situation, Background, Assessment, Recommendation Communication Protocol (SBAR) is a communication protocol, which the ICU/CCU implemented when nurses reported patient information to physicians or requests for physician action. SBAR consists of reporting four phases in which the nurse gives: (a) context or *Situation*; (b) a brief history or *Background*; (c) a clinical *Assessment* with clinical data; and (d) a *Recommendation*.
4. Adoption is the acceptance of the practice and use of it in daily work.
5. Verbiage is the language or diction which was used.

APPENDIX N

CHARACTERISTICS OF COLLABORATIVE PHYSICIANS

Categories and Subcategories Which Emerged from Nurse IP1a. Interviews and Analysis

I. Physician Communication Strategies

- a. created rapport upon entering the unit
- b. gave eye contact
- c. listened well
- d. explained fully
- e. gave positive reinforcement

II. Physician Practices

- a. visited patients at early, predictable times
- b. sat beside the nurse to review the chart and orders
- c. Requested that the nurse accompany him on his patient rounds.

III. Physician Behaviors Affirming Nurse Collegial Role

- a. professionally responded to nurse questions and telephone calls
- b. visited patient due to nurse request
- c. sought and valued nurse input related to patient care
- d. accepted and valued their questioning of orders

APPENDIX O
CHARACTERISTICS OF COLLABORATIVE NURSES

Categories and Subcategories Which Emerged from Physician IP1a. Interviews and Analysis

- I. Nurse Communication Strategies
 - a. Reported in an organized manner
 - b. Listened well
 - c. Dialogued with physicians
 - d. Advanced opinions and differences in an appropriate manner
- II. Nurse Knowledge and Competence
 - a. Had excellent clinical judgment and experience
 - b. Used critical thinking skills proactively
 - c. Was well-informed about her patient
 - d. Developed patient psycho-social assessment and problem-solving skills
- III. Nurse-physician rounding process.

CURRICULUM VITAE

NAME: Jacqueline Carter Gerard
ADDRESS: 709 Pear Orchard Rd.
Elizabethtown, KY 42701
DOB: Ft. Riley, Kansas-February 22, 1948

EDUCATION
& TRAINING: B.A. English and Speech
University of Kentucky
Lexington, KY 1966-1970

M.A. Counseling Psychology
Spalding University
Louisville, KY 1974-1977

Ph.D. candidate, Educational Leadership
and Organizational Development
University of Louisville
Louisville, KY 2003-present

PROFESSIONAL SOCIETIES: Phi Beta Kappa

PUBLICATIONS:

Chaney, M. & Gerard, J. C. (2003). Improving care of patients with alcohol withdrawal syndrome in a community hospital. *The Joint Commission Journal of Quality and Safety*, 29, 94-7.

Gerard, J.C. & Arnold, F.L. (1996). Performance improvement with a hybrid FOCUS-PDCA Methodology. *The Joint Commission Journal on Quality Improvement*, 22, 660-672.

NATIONAL MEETING PRESENTATIONS:

“A Team Redesign of a Antibiogram” at The National Congress on the Crisis of Antibiotic Resistance”, sponsored by The Juran Institute and the Institute of Healthcare Improvement, Boston, January, 1996.

“Improving Customer Satisfaction in ED with Communication Protocols” at The National Congress on Reducing Delays and Improving Customer Satisfaction in the ED, sponsored by the Institute of Healthcare Improvement, Orlando, November 1998.

INVITED PRESENTATIONS:

“The Big Ones that Did Not Get Away; Improving Patient Satisfaction,” Press, Ganey and Associates National Client Conference, Orlando, 2000.