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Pediatric wound care: Establishing a consensus group to develop clinical practice guidelines

Abstract

Introduction. Wound care practices for neonatal and pediatric patients have created a lack of standardized evidence-based guidelines for treatments in clinical practices. Unfortunately, published clinical guidelines for the evaluation and management of wounds in pediatric populations is limited. Consensus groups are used to develop clinical guidelines which define key aspects of the quality of health care, particularly appropriate indications for interventions. The aim of this initiative was to conduct the first two steps of the guideline development process, and to report on the findings from the expert consensus group for pediatric wound care.

Methods. The goal was to recruit a multidisciplinary team that consisted of board certified Pediatric Plastic and Pediatric General Surgeons, WOCN, and research specialists active in the International Society of Pediatric Wound Care (ISPEW). All recruited individuals were emailed and invited to participate. For this study, an adapted questionnaire was created to assess eligibility criteria, information sources, systematic review database search strategies, study selection criteria including keywords. Data was collected on the clinical consensus group's experience with clinical guideline development, and other clinically significant domains for which the the evidence should be evaluated.

Results. All six invited individuals agreed to participate. 100% of respondents provided the number of years in their current role within their respective institutions and their length of experience with pediatric wound care management. 17% of respondents had 7 to 10 years in their current role, while 66% had more than 10 years practice in pediatric wound care. Domains identified as important to consider included: Cost of Product/Treatment Duration of Treatment, Ease of Applying Product/Performing Treatment, Accessibility of Product, Storage of Product, Length of Time to Apply Product/Perform Treatment.

Discussion. The agreed-upon domains from our study align with previously published consensus group studies. We identified several domains to inform a future systematic review. At this time, no systematic review has been published that has been guided by consensus group domains and search terms for pediatric wound care.

Conclusion. Through the use of this consensus group and conducted surveys, we identified the primary domains necessary to complete a practice-informed systematic review, as well as other key domains that are important in clinical pediatric wound care management.

Keywords

Pediatric wound care, consensus group, clinical practice guidelines, wound care guidelines

Authors

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Introduction

The pediatric management of wound care in the United States is a growing concern among the few wound care clinics across the country. The increasing complexity of medical and surgical treatment plans used for the pediatric population has resulted in a population of significant risk for complications such as non-healing surgical wounds, pressure ulcers, and moisture associated skin damage. Wound care practices for neonatal and pediatric patients including the category of products, specific products within each category, and length of application of the products have created a lack of standardized evidence-based guidelines for treatments in clinical practices. Factors that have resulted in this variability in the practice gap include provider experience with the products, product availability, provider preference, or a small number of published clinical guidelines based on expert opinion. (Black et al., 2015; Boyar, 2019; King et al., 2014).

Treating pediatric wounds requires a complex decision-making process that is a much different approach than tending to wounds in adults (King et al., 2014; McCord & Levy, 2006). Understanding wound healing at multiple levels—biochemical, physiologic, cellular and molecular provides the provider with a framework for basing clinical decisions aimed at optimizing the healing response. (Chhabra et al., 2017). Using advanced wound treatments including debridement, negative pressure therapy, ointment-impregnated dressings, and skin grafting are key to healing chronic wounds such as pressure ulcers, surgical wounds, epidermal stripping, intravenous extravasation injuries, and moisture-associated skin damage wounds.

The development of Clinical Practice Guidelines is achieved by experts in the field who use an evidence-based approach to combine research with expert consensus on best practice (American Academy of Pediatrics, 2021). The five steps of guideline development include 1) Identifying and refining the subject area, 2) Convening and running guideline development groups, 3) On the basis of systematic reviews, group assessment of the evidence about the clinical question or condition, 4) Translate evidence into a recommendation within a clinical practice guideline and, 5) External review of the developed guideline.

The purpose of this initiative was to conduct steps one and two of the guideline development process, and to report on the findings from the expert consensus group for pediatric wound care. Our overarching goal of convening the expert group was to produce practice-informed recommendations for search terms and domains for a future systematic review (step three of guideline development).

Background

Wound Management Issues in Pediatrics

The weak point of evidence on the clinical efficacy of proper dressing criteria is reportedly related to the low strength of research and database efficiency. Despite rapid advances in medical and nursing care of pediatric patients and the increasingly complex level of care provided, there has been limited formal assessment of the prevalence, type, and management of wounds in this population. Four basic phases are considered when healing complex wounds: coagulation and hemostasis, inflammation, proliferation and repair, and wound maturation and remodeling. Current research reveals that hospitalized pediatric populations are at significant risk for the development of these complex wounds (King et al., 2014). Multisite studies of tertiary-care children's hospitals revealed 43% of patients had a wound associated with a surgical incision, 16% of patients developed diaper dermatitis and 6% of patients were thought to be at risk for developing pressure ulcers. Sixty-six percent of the patients who developed

pressure ulcers were found to be facility associated. Amongst those discharged from the hospitals and receiving home health care, 17% of children still had the chronic wound and relied heavily on provider knowledge and consensus for the most appropriate standard of care. Pressure ulcers and open surgical wounds among this pediatric population often were cleansed with hydrogen peroxide, household soap, or povidone-iodine, while 44% were treated with dry gauze, and 19% with normal saline dampened gauze. However, more than 90% of the home care nurses interviewed for this study described the pediatric wound care as appropriate (Baharestani, 2007).

Importance of Understanding Advanced Wound Care

Published clinical guidelines for the evaluation and management of wounds in pediatric populations is limited. Wound care practices and the selection of wound care product usage currently reflects the provider's experience with and knowledge of wound care management (Boyar, 2019; King et al., 2014). Not only is it imperative to understand the advanced treatment of wounds, it is also important to understand the cost analysis of clinician time and financial resources required to administer the proper treatment protocol. Nearly six million people, from adults to children, suffer from chronic wounds every year. Advanced wound healing has become a topic of ongoing research and debate with more than 1.25 million burns in the Unites States annually and 6.5 million chronic skin ulcers caused by pressure, venous stasis, or diabetes mellitus (Sood et al., 2014). The annual cost of caring for chronic wounds in the United States approaches 28 billion (Chandan, 2019). The wound management market is estimated to reach a value of \$4.4 billion in 2019 from \$3.1 billion in 2012 (Dabiri et al., 2016).

Practitioners can mitigate excessive resource utilization by selecting the optimal wound dressings for patients (Dabiri et al., 2016). The use of evidence-based practice in wound care is essential in achieving better patient outcomes and has the potential to reduce hospital wound care costs (Gillespie et al., 2015) Clinical Consensus Statements (CCS) are at the forefront of driving clinical decision-making processes in other fields of medicine; whereas, evidence-based guidelines for wound care management have been lacking for the last 20 years.

Clinical Consensus Statements and Expert Groups

Clinical Consensus Statements (CCS) reflect opinions drafted by content experts for which consensus is sought using explicit methodology to identify areas of agreement and disagreement. A CCS is most applicable to situations where the evidence base is insufficient for a clinical practice guideline (CPG) but for which significant practice variations and quality improvement opportunities exist (Rosenfeld et al., 2015). This CCS is based on the views of subject expect panelists who actively treat pediatric patients in the field of wound care. The outcomes of this type of CCS are to 1) identify domains of expert consensus regarding the costs associated with a wound care product and the treatment of the wound, the duration of the wound treatment, the ease of performing the wound treatment on pediatric patients, the accessibility of the product in the health care industry, the available storage of the product, and the length of time pertaining to applying the product or treatment to the wound; 2) identify the indications for surgical intervention on different types of wounds; 3) perioperative management of the wound, and 4) review the expected outcomes of the review. The core result of a CCS is derived from an adapted Delphi method survey. The Delphi method is a systematic, iterative approach to identifying consensus without face-to-face interaction (Rosenfeld et al., 2015).

The goals of the International Society of Pediatric Wound Care (ISPeW) are to: 1) set global standards for the assessment and treatment of pediatric wounds of varying etiologies; 2) provide a forum for international, interprofessional collaboration among healthcare professionals, researchers, educators and industry leaders dedicated to the care of pediatric wounds; 3) promote and support clinical research focused on the prevention, assessment and treatment of pediatric wounds; 4) collaborate with wound care organizations worldwide on pediatric wound care issues; and, 5) provide evidence based pediatric wound care education to healthcare professionals, parents and lay caregivers (International Society of Pediatric Wound Care (ISPeW), 2011). With the help of the International Society of Pediatric Wound Care (ISPeW), a multidisciplinary panel of experts can be assembled to build a CCS.

Clinical decision-making for the creation of CPG is defined as the process of gathering information to enable clinicians to make a judgment about a course of action (Gillespie et al., 2015). There are currently only a limited number of published clinical guidelines for the evaluation and management of wounds in the neonatal and pediatric populations. To date, none of these guidelines have undergone the rigorous assessment required for the generation of evidence-based guidelines. As such, wound care practices and selection of wound care products tend to reflect provider experience and preference. Three qualitative studies published over the last 20 years that described clinical decision-making in wound care found that decisions were informed by knowledge, based either on research, practice underpinned by experience, or commonsense (Gillespie et al., 2015; Luker & Kenrick, 1992). Ideally, a clinical guideline should be developed to assist practitioners treat infants and children with different types of wounds, and allow practitioners to make informed decisions appropriate wound care and treatment.

Developing Guideline Development Groups

Identifying stakeholders involves identifying all of the groups whose activities would be covered by the guideline, or who have other legitimate reasons for having an input into the process. This is important to ensure adequate discussion of the evidence (or its absence) when developing the recommendations in the guideline. When presented with the same evidence, a single specialty group will reach different conclusions than a multidisciplinary group while the specialty group will be systematically biased in favor of performing procedures in which it has a vested interest (Coulter et al., 1995; Kahan et al., 1996). Ideally the group should have at least six but no more than 12 to15 members. Too few members limit adequate discussion, and too many members make effective functioning of the group difficult (Schmeer, 2000).

Consensus groups are increasingly being used to develop clinical guidelines which define key aspects of the quality of health care, particularly appropriate indications for interventions. Given the resources required to identify all relevant primary studies, many guidelines rely on systematic reviews that were either previously published or created de novo by guideline developers. Systematic reviews can aid in guideline development because they involve searching for, selecting, critically appraising, and summarizing the results of primary research. Most systematic reviews rely substantially on the foundational understanding of the researcher on the topic of discussion.

Methods

Formation of the Expert Consensus Group

The first step in the initiative to produce practice-informed recommendations for search terms and domains for a future systematic review (step 3 of guideline development) was to recruit a multidisciplinary team that consisted of board-certified Pediatric Plastic and Pediatric General Surgeons Published by the Baylor College of Medicine, Division of Academic General Pediatrics, 2020 active in the International Society of Pediatric Wound Care (ISPEW). The President of ISPEW was contacted and the details of the proposed initiative was discussed. Criteria for selection of the consensus group members included: 1) Research graduates active in Pediatric Wound Care research, 2) Board certified Physicians actively practicing in their aforementioned pediatric general surgery or pediatric plastic surgery subspecialty, and, 3) Wound Ostomy Care Nurse actively practicing in pediatric wound care. The President selected six individuals (two from each category) and emailed them inquiring about their interest in participating in the research study. All recruited individuals were emailed and agreed to participate after a detailed description of the research project was provided.

Adaptation and Implementation of a Web-Based Questionnaire

An adapted questionnaire was created for this study using the Clinician Guideline Determinants Questionnaire, which is a comprehensive and validated instrument that addresses multiple potential determinants specific to guideline use from a clinician perspective (Gagliardi et al., 2019). The questionnaire can be used at multiple time points in the guideline development cycle to assess determinants of the use of new, updated, or adapted guidelines and before and after interventions to assess their impact on the determinants of guideline use (Boulkedid et al., 2011). For this study, the adapted questionnaire was created to address eligibility criteria, information sources, systematic review database search strategy, study selection criteria including keywords, the clinical consensus group's experience with clinical guideline development, and finally other clinically significant domains for which the evidence should be evaluated.

Domains were created and the consensus group was polled to determine if the evidence should be displayed using certain criteria. Additional domains considered included applicability of the evidence to the population of interest (its generalizability), costs, knowledge of the healthcare system, and beliefs and values of the panelists. These additional domains were extracted from pediatric wound care clinics in which patients voiced and experienced these concerns throughout their treatments. In the adapted survey used for this study, search domains included types of wounds treated by each of the consensus group members such as pressure ulcers, surgical wounds, and epidermal stripping. The conducted survey was then used to derive the most crucial information recorded at each of the members' practices and institutions pertaining to the listed types of wounds treated. Survey Monkey was used to create an online survey instrument for the expert consensus panel with 16 questions ranging from demographic related questions, systematic review details, and domain inquiries (see Appendix 1). Upon completion, responses were downloaded from Survey Monkey for descriptive analysis.

Results

The results from the survey of the expert consensus group yielded the demographic data shown in Figure 1 and Figure 2. Each of the six respondents provided the number of years in their current role within their respective institutions and the length of experience with pediatric wound care management. This data identified specific and general information as to the length of years consensus group members had in treating pediatric wounds. Seventeen percent (17%) of respondents had seven to 10 years in their current role while 66% had more than 10 years practice in pediatric wound care.

The survey asked each consensus group respondent to check types of Figure 1 Length of consensus group members in their current role







communication interactions experienced during participation with previous clinical consensus statement development groups. The analysis of the findings portrayed in Table 1 describes the type of communication processes that Table 1

were used in prior consensus development groups. In-person meetings and email communication exchanges were the dominate types of communication utilized, while 67% of the consensus panelists conducted conference call meetings during the process.

Table 2 shows the primary types of wounds consensus group members treated within their respective practices. Wound types included, but were not limited to, pressure ulcers, surgical wounds, intravenous injuries, extravasation epidermal stripping, moistureassociated skin damage and advanced wound therapy treatments.

The implications for intervention in pediatric wound care listed in Table 3 such as the cost of a product/treatment, duration of a treatment, ease of Types of recorded communications used during this survey and other reviewed surveys

Type of Communication	Number of Responses	Percentage Value
In-Person Meetings	5	83%
Conference Call Meetings	4	67%
Email Communication	5	83%
No Participation in Guideline Development	0	0%
Other	0	0%

Table 2

Types of Wounds Treated

Type of Wounds Treated	Number of Responses	Percentage Value
Pressure Ulcers	5	83%
Surgical Wounds	5	83%
Intravenous Extravasation Injuries	5	83%
Epidermal Stripping	5	83%
Moisture-associated Skin Damage	5	83%
Advanced Wound Therapy Treatments	5	83%

Table 3

Intervention Implications for Pediatric Wound Care

Intervention Implications for Pediatric Wound Care	Number of Responses	Percentage Value
Costs of Product/Treatment	5	83%
Duration of Treatment	6	83%
Ease of Applying Product/Performing Treatment	6	83%
Accessibility of Product	4	83%
Storage of Product	3	83%
Length of Time to Apply Product/Perform Treatment	5	83%
	1	

applying a product/performing the treatment, accessibility patients have to a product, storage of a product, the length of time necessary to apply a product/to perform the treatment, and, the types of wounds mentioned above were seen most commonly amongst the group members at their respective

practices. The pertinent information described in Tables 2 and 3 were used to create search domains for planned systematic reviews.

Discussion

There are a limited number of published clinical guidelines for the evaluation and management of wounds in the neonatal and pediatric populations available to guide practitioners. Consensus groups are increasingly being used to develop clinical guidelines for future wound care management (King et al., 2014). Questionnaires are a commonly used approach for identifying determinants for systematic reviews because they are relatively inexpensive, reach a large audience, and convenient for busy health care professionals, particularly when administered online. Although guideline developers often lack the resources and capacity to develop and validate determinant questionnaires, the need for a validated guideline determinants questionnaire is widespread (Gagliardi et al., 2019).

The years of experience of the five consensus group members polled in the survey were consistent with the years of experience that consensus groups of previous wound care studies have found. The majority of the polled members are leaders in their field and have all previously played a vital role in clinical guideline development consensus groups.

Previous clinical guideline development projects have recorded several key pieces of information pertaining to decisions concerning the domains of wound care management and which have been the most crucial for successful treatment and overall patient satisfaction (Rosenfeld & Shiffman, 2009). These domains have been driven by various methods of focus during the survey process in both our study and previously reviewed studies in literature including duration and lengths of discussion meetings, whether in person or via electronic interface, as well as how data collected was reviewed and analyzed, such as in person, face to face, or via conference call.

The survey process for this study yielded the resulting types of pediatric wounds treated and implications for intervention used in the decision-making process by the consensus group members and will play a vital role in determining the primary search domains necessary to complete a systematic review of literature required for a consensus-based clinical guideline development protocol in pediatric wound care. With the addition of a full systematic review of recently published literature, wound care treatments, procedures and products will be further analyzed and compared to provide one of the most up-to-date evaluations in pediatric wound care management.

Conclusion

The goal of this study was to obtain consensus among experts about pediatric wound care. Results showed that all the expert consensus respondents treat similar types of wounds and face similar implications for interventions in their respective clinical practice. Through the use of the consensus group and conducted surveys, we were able to identify the primary search domains necessary for a planned systematic review process, as well as other key domains that are important in clinical practice including wound care treatments, procedures and products in pediatric wound care management. This study has revealed several key pieces of information pertaining to decisions concerning the domains of wound care management and which domains have been the most crucial for successful treatment and overall patient satisfaction. A future study will conduct a systematic review and use the clinical consensus group data to develop clinical guidelines for standardization of treatment plans for the pediatric wound patient.

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Appendix A The Pediatric Wound Care Systematic Survey

- Pediatric Wound Care Systematic Consensus Survey
 - 1. What is your current title?
 - 1. What is your highest terminal degree? a. MD
 - b. RN

 - c. PhD
 - d. Other: Please specify (free text)
 - 2. How long have you been in your current role?
 - a. Less than one year
 - b. 1-2 Years
 - c. 3-5 Years
 - d. 5-7 Years
 - e. 7-10 Years
 - f. Greater than 10 years
 - 3. How many years of experience do you have with Pediatric Wound Care?
 - a. Less than one year
 - b. 1-2 Years
 - c. 3-5 Years d. 5-7 Years

 - e. 7-10 Years
 - f. Greater than 10 year 4. Are you currently employed in a?
 - a. Large practice
 - b. Solo practice
 - c. Hospital
 - d. Other: Please specify (free text)
 - 5. Have you ever participated in a clinical guideline development consensus group?
 - a. Yes
 - b. No
 - 6. If you have participated in guideline formation, what did the process include? Check all that apply. Free text is available if desired.
 - a. Face to face meetings
 - b. Skype or conference call meetings
 - c. Communication via email
 - d. Have not participated in guideline formation
 - e. Other: Please specify (free text)

- 7. Please indicate the frequency and duration of meetings if applicable.
- 8. If you have participated in guideline formation, were you satisfied with the process?
 - a. Yes
 - b. No
 - c. Have not participated in guideline formation
- d. Other: Please specify (free text) 9. If you have or have not participated in guideline formation, what methods of meetings would
- you prefer? Check all that you apply.
 - a. Longer meetings, less frequency
 - b. Shorter meetings, more frequency
 - c. Face to face meetings only
 - d. Communication via email only
 - e. Skype / telecommunication meetings only
 - f. Other (please specify) (free text)
- 10. If you were to do a clinical guideline development, which of the following would you recommend? Check all that apply.
 - a. Multiple face to face meetings with all consensus group members to review data in a series
 - b. Receive all information via email to individually review with one-2-hour Skype/face to face meeting to discuss guideline creation
 - c. One hour face to face meeting to review data with a mock clinical guideline developed by the PI, then to follow up via email to discuss edits and recommendations on the proposed clinical guidelines
 - d. Other: Please specify (free text)
- 11. Eligibility criteria will be determined a priori and require that studies focus on pediatric wound care. Please indicate eligibility criteria you believe should be included in the study.
 - a. Only systematic reviews with studies conducted in the United States will be included
 - b. If a systematic review includes studies in the US as well as other countries, it will [automatically be excluded] OR [included if data and findings for the US studies are readily ascertainable from the article].
 - c. Only systematic reviews published in English-language journals will be included; non-English systematic reviews will be excluded.
 - d. Other: Please specify (free text)
- 12. Databases will be searched with the assistance of a health sciences librarian experienced in developing search strategies for systematic reviews.
 - Please indicate all databases that you feel should be included in the study.
 - a. Medline (Ovid)

 - b. PubMed (NLM)
 - c. SocINDEX with Full Text (EbscoHOST)
 - d. Academic Search Complete (EbscoHOST)
 - e. the National Center for Biotechnology Information
 - f. PsycINFO (Ovid)
 - g. Other: Please specify (free text)
- 13. Example search terms are listed below. Please indicate all search terms that you feel should be used for the study:
 - a. pressure ulcers
 - b. surgical wounds
 - c. intravenous extravasation injuries
 - d. epidermal stripping
 - e. moisture-associated skin damage
 - f. the use of advanced wound therapy treatments
 - g. Other: Please specify (free text)
- 14. Domains that may influence clinical decision-making are below. Please indicate all domains that you feel should be considered when summarizing systematic review findings
 - a. Cost of product/treatment
 - b. Duration of treatment
 - c. Ease of applying product or performing treatment
 - d. Accessibility of the product
 - e. Storage of the product
 - f. Length of time to apply the product or perform the treatment
 - g. Other: Please specify (free text)

Is there any additional information you would like to share related to the research study?