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Let's pick up the iPace Leveraging innovative educational research to redesign healthcare delivery

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Let's pick up the iPace Leveraging innovative educational research to redesign healthcare delivery

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Let's pick up the iPACE!

*Leveraging innovative educational research
to redesign healthcare delivery*



We are better together!

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Executive Summary

The Interprofessional Partnership to Advance Care and Education (iPACE) model is an innovative blueprint designed to improve patient and healthcare team experience. It has been shown to provide more efficient and cost-effective care, as well as prepare current and future healthcare team members to meet the challenges of working in a rapidly evolving clinical environment. The iPACE model was developed through an iterative and adaptive design process that has been formulated to empower inter-professional inpatient teams to construct new collaborative systems of care and communication. The pilot project, funded by a grant from the Accreditation Council for Graduate Medical Education (ACGME), re-designed healthcare delivery on a novel 11-bed Internal Medicine unit by centering the interprofessional team around the patient. Outcome data from this innovation demonstrated high levels of patient and family satisfaction, improved team functionality (well-being and communication), willingness to work on patient safety as a team, improved feedback to learners and shorter lengths of stay and cost of care.^{1,2} The success of the iPACE pilot led Maine Medical Center (MMC) to be awarded a \$2M American Medical Association (AMA) grant through the “Reimagining Residency” initiative. The “iPACE Across, Out and Over” project was funded for five years with the goal to inspire the creation of new healthcare delivery models based on the iPACE principles (Appendix 1). iPACE team care is care that meets the needs of each patient, provided by *one team* during *one* round with *one message* for the patient and family.

Let's pick up the iPACE

This proposal would leverage the remaining funding (Appendix 2) over the next three years, to facilitate the transition from iPACE as an innovative education project (iPACE-Innovate) to the standard of practice within MaineHealth inpatient units (iPACE-Ops). Inspired by the motto; ‘**We are better together**’, this project would

streamline the current six-step, research-focused implementation strategy to one that allows teams to efficiently build their own unit-specific iPACE care models. Patient safety and quality metrics would continue to be collected, analyzed and utilized to improve healthcare delivery and refinement of the iPACE model. Those processes would transition to the MaineHealth Integrated Quality and Safety Department and the Operational Excellence program in the form of unit-specific balanced scorecards and relevant Key Performance Indicators (KPIs). Educational outcomes would remain a medical education research endeavor to achieve the grant's obligations to the AMA.

MaineHealth is a values-based academic healthcare system, with a commitment to patient-centered, respectful, high-quality care. Team-based collaboration is an essential component to the effective execution of the six values. The iPACE model is an innovative, locally- and nationally-endorsed interprofessional team-based care and education model that has successfully operationalized these values while improving the efficiency of care and optimizing patient and family experience. The success of iPACE as a focused medical education innovation should no longer be confined to small scale, grant-funded projects. The iPACE model is ready to be the catalyst to redesign inpatient healthcare delivery at MaineHealth. iPACE is how we collectively provide the best care to our patients, the best support to our teams, and the highest value to the health system.

We are better together!



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Introduction

Fifty years ago (1972), the Institute of Medicine³ (IOM) recommended that academic health centers prioritize interprofessional education (IPE) as a way to improve health outcomes. Yet, it wasn't until the release of the subsequent IOM reports: *To Err is Human*⁴ and *Crossing the Quality Chasm*⁵ that IPE and IPCP (interprofessional collaborative practice) were broadly recognized as successful strategies to increase the quality and consistency of healthcare.

In 2009, a collaboration of national associations of schools of health professions first met with the goal of creating core competencies to prepare students to practice team-based care, these were later published as the *Core Competencies for Interprofessional Collaborative Practice*⁷ (Appendix 3). Since the release of these competencies, IPE and IPCP skills have become an integral and frequently mandatory part of healthcare education. Wide acceptance of these competencies and their inclusion in pre-clinical curricula have led learners to expect that IPCP should be the standard of care in the “real world”. The Accreditation Council for Graduate Medical Education (ACGME) has also mandated that residents and fellows care for patients in an environment that maximizes communication and provides them the opportunity to work in effective interprofessional teams⁸.

Yet the care that patients experience is very different than the collaborative ideal. Our healthcare systems are disjointed and duplicative and diminish trust and confidence in the team and plan of care, especially in the inpatient setting. The inpatient environment has been structured to allow healthcare workers to efficiently perform their unique care roles for a large volume of acutely ill patients. The behaviors and systems that make this possible have been developed primarily in silos by and for those disciplines and are often not collaborative. Unfortunately, these healthcare worker-centric systems do not always serve patients as well as they do providers. View *Faith Foster's story* of her experience at MMC.

Interprofessional education (IPE): “when two or more professions learn about, from, and with each other to enable effective collaboration and improve health outcomes.”⁶

Interprofessional Collaborative practice (IPCP): “when multiple health workers from different professional backgrounds provide comprehensive services by working with patients, their families, caregivers and communities to deliver the highest quality of care across settings.”⁶



Accreditation Council for
Graduate Medical Education

[ACGME Commits Funding for Pursuing Excellence in Clinical Learning Environments](#)

Highly effective, functional teams are those that cultivate habits that meet both the needs of healthcare workers and patients. This is achieved by creating and delivering care that is efficient, high quality, clearly communicated, unified and patient-centered. Best practices to foster interprofessional collaboration in the inpatient setting have been identified^{9, 10, 11, 12} and include:

- geographic co-location of clinicians and patients
- structured, scheduled interprofessional rounds
- physician – nurse leadership dyads
- interprofessional educational sessions to promote cross-disciplinary learning and collaboration.

The iPACE model was developed through an iterative and adaptive design process inspired by these best practices. It empowers interprofessional inpatient teams to construct new collaborative systems of care and communication. iPACE has been shown to provide more efficient and cost-effective care, improve patient and healthcare team experience and prepare current and future healthcare team members to meet the challenges of working in a rapidly evolving clinical environment¹.

The Genesis of iPACE: Pursuing Excellence in Innovation

In 2016, MMC was awarded an ACGME *Pursuing Excellence in Innovation (PEI)* grant to redesign the clinical learning environment (CLE) and prepare residents to work as members of high-functioning teams. The iPACE model started with the conviction that *the patient* is the center of healthcare delivery around whom the team should unite around to provide coordinated care and consistent communication.

This core tenet led to the development of the iPACE principles (Appendix 1). The principles were adapted and refined based on recommendations found in the inpatient interprofessional collaborative practice literature. The result was a multi-pronged intervention to promote interprofessional care and education that became the pilot “iPACE Unit” - a new 11-bed inpatient internal medicine (IM) teaching unit. View *iPACE in Action* at MMC.



[Play video here](#)

Faith Foster's Story

Born in Rochester, NY in 1945, Faith Foster was a lifelong teacher and candy store owner in Boothbay, Maine. She shared the story of her care at Maine Medical Center where she experienced variable communication, lack of cohesion, and the need to advocate for herself. Her story is presented at annual new resident orientation to teach new doctors about the importance of patient safety and quality improvement at MMC. (4:22)



[Play video here](#)

iPACE in Action

Watch care team members provide exceptional care through the iPACE model. (3:56)

Note: This video was produced before the COVID-19 pandemic.

The iPACE principles were manifested on this pilot unit as structured interprofessional bedside rounds that included all members of the care team and the patient/family. The iPACE unit also featured co-located patients and care teams and had dedicated time for learning lead by and for the interprofessional team. The pilot unit was intentionally designed as a “learning laboratory” to allow the team to continually self-assess the model and systems with the goal of continual improvement in care. As a quality improvement project, early iPACE metrics were carefully chosen to assess the iPACE model based on:

- patient and family experience
- team functionality (well-being and communication)
- financial impact (length of stay and cost of care)
- educational impact.

The outcomes of the initial iPACE pilot were published in the *Journal of Graduate Medical Education and Medical Teacher*^{1,2}.

Key Findings

Patient and Family Experience

Early anecdotal feedback from patients, families, and the care team about the iPACE pilot model was overwhelmingly favorable. This led to the development of a patient survey.

Although the results were limited by small numbers, patient/family surveys were uniformly positive, showcasing improvements in understanding and communication of the care plan early in the day. High rates of perceived patient and family satisfaction were captured in team member focus groups.

Team Functionality – Well-being and Communication

Several important measures of team well-being were detected in the pre- and post-implementation analysis of the iPACE model (Table 1). Care team members reported having a more professionally rewarding experience while working on the iPACE unit ($p<0.0001$). Additionally, care team members reported that the team was actively doing things to improve patient safety ($p=0.05$). Complete results of the team functionality survey are included in Appendix 4.

“My family has been notified of every move. We have NOT felt confused at any time. It has been made very clear who does what! The communication has been exceptional and we appreciate it so much.”

“This team of doctors...has been the best communicators yet”

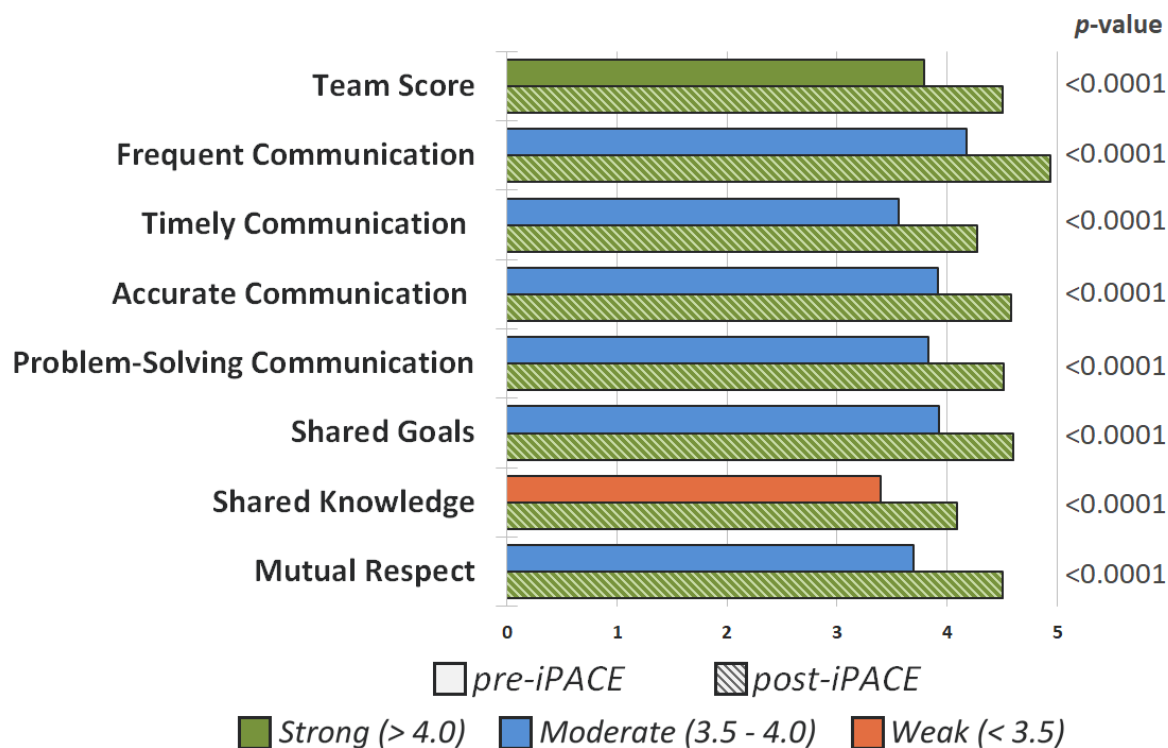
“Each team member has been on the same page and has been wonderful including the RN's. I am completely comfortable leaving mom alone.”

Table 1. Team functionality survey results of pre- and post-iPACE implementation

Measure	pre-iPACE ^a Mean (SD)	post-iPACE ^a Mean (SD)	p-value
Experience professionally rewarding	3.5 (1.00)	4.4 (0.62)	<0.0001
Team communication	3.7 (0.81)	4.1 (0.84)	0.03
Team actively doing things to improve patient safety	4.0 (0.95)	4.4 (0.83)	0.05

^aLikert scale from 1 - 5, where 5 is strongly agree and 1 is strongly disagree

Team communication and functionality were assessed utilizing Relational Coordination (RC), a well-established theoretical framework and validated survey. The RC framework states that good teamwork is reliant on a “mutually reinforcing process of communicating and relating for the purpose of task integration¹³.” These reinforcing processes are captured in two categories: dimensions of communication (frequency, timeliness, accuracy and problem-solving) and attributes of relationships (shared knowledge, shared goals and mutual respect)¹⁴. High RC scores have been found to be predictive of strategic performance outcomes like quality, efficiency, customer satisfaction, workforce resilience, well-being, and innovation¹⁵. The RC scores of the pre- and post-iPACE implementation improved ($p < 0.0001$) across all seven domains (Figure 1).

Figure 1. Relational Coordination survey results of pre- and post-iPACE implementation

Financial Impact

The iPACE model demonstrated potential cost savings, sustained over two years of the pilot, when compared to a similar non-iPACE unit. This was largely driven by a decreased length of stay without a significant increase in 30-day readmission rates. Patients on the iPACE unit, on average, experienced a length of stay of 4.48 days versus a length of stay of 5.22 days for those on the comparison unit for all diagnostic related groups (DRGs). Cost of care for patients on the iPACE unit was statistically significantly less, on average (\$9,762 vs. \$12,589) than for patients on the comparison unit (Table 2).

Table 2. Financial Impact of iPACE on Length of Stay (days) and Cost of Care (dollars)

Diagnosis related groups (DRGs)	Average length of stay (in days)		Average cost of care (in dollars)	
	iPACE	Comparison Unit	iPACE	Comparison Unit
871 – Septicemia	5.24	6.09	\$10,676	\$14,743
291 – Heart Failure	4.25	5.92	\$8,977	\$11,872
All DRGs, average	4.48	5.22	\$9,762	\$12,589

Data presented:

- Represents the period from October 2017 – September 2018
- 30-day readmission rates were utilized as a balancing metric and were not statistically different
- The comparison unit was selected based on a similar patient population (average age and gender), payor source; disposition (discharged to home or long care term facility); case mix index (CMI), and diagnosis.

Educational Impact

The iPACE model was initially developed as an intervention to transform the CLE and prepare residents to practice in high-functioning healthcare teams. Overall, learners and faculty agreed that the iPACE model was successful in teaching best practices in interprofessional care and allowed for more direct observation of learners.

A retrospective study of narrative resident rotation evaluations was subsequently conducted to determine what impact, if any, the iPACE model had on the length and quality of written feedback of residents by attendings compared to other internal medicine teaching teams². A total of 692 evaluations were reviewed and results showed that evaluations of iPACE residents were significantly longer than those of residents on other teaching teams ($p < 0.001$); contained

“There’s a lot of things that I learned... that we’re not trained in medical school... You’re not trained about the jobs of other people. And where do you fall in that hierarchy? And what is the responsibility of those people? ... We’re not told how that works. So yes, it helped understand the goal of the interprofessional team.” –Intern

a significantly higher percentage of direct observations of patient/family interactions and feedback on interprofessionalism, as well as more specific, actionable, and corrective feedback ($p \leq 0.001$) (Table 3).

Resident focus groups did reveal a need for better orientation to and preparation of both residents and attendings for teaching at the bedside, to improve confidence and presentation skills in front of patients and family. Aligned with the ACGME's priority of reducing burnout and addressing well-being, practice models like iPACE help physicians rediscover joy and meaning in work. ([Back to Bedside](#)). Further study is needed to determine what additional effect interprofessional decision-making may have on all learners.

"I think the biggest benefit is just seeing and observing how other providers communicate with patients about their diagnosis, therapies, doing shared decision-making. I think observing each other is really the biggest thing that they gain that they get less of—not that they don't get at all, but they'll get less of in other models."

—Attending

Table 3. Percentage of Faculty Evaluations of Residents on that Contained at Least One Example of Feedback per Category (iPACE™ vs. Usual)

Type of Feedback	iPACE™ % (N) N = 193	Usual % (N) N = 499	p-value ^a (Alpha = 0.05)
Direct Observation	48.2 (93)	25.9 (129)	<0.001
Interprofessionalism	14.5 (28)	5.2 (26)	<0.001
Specific	91.2 (176)	79.8 (398)	<0.001
Actionable	61.7 (119)	44.5 (222)	<0.001
Reinforcing	97.4 (188)	93.4 (466)	0.03
Corrective	66.3 (128)	50.7 (253)	<0.001

^a p values represent results from a chi-squared test between models of care, iPACE™ vs. usual

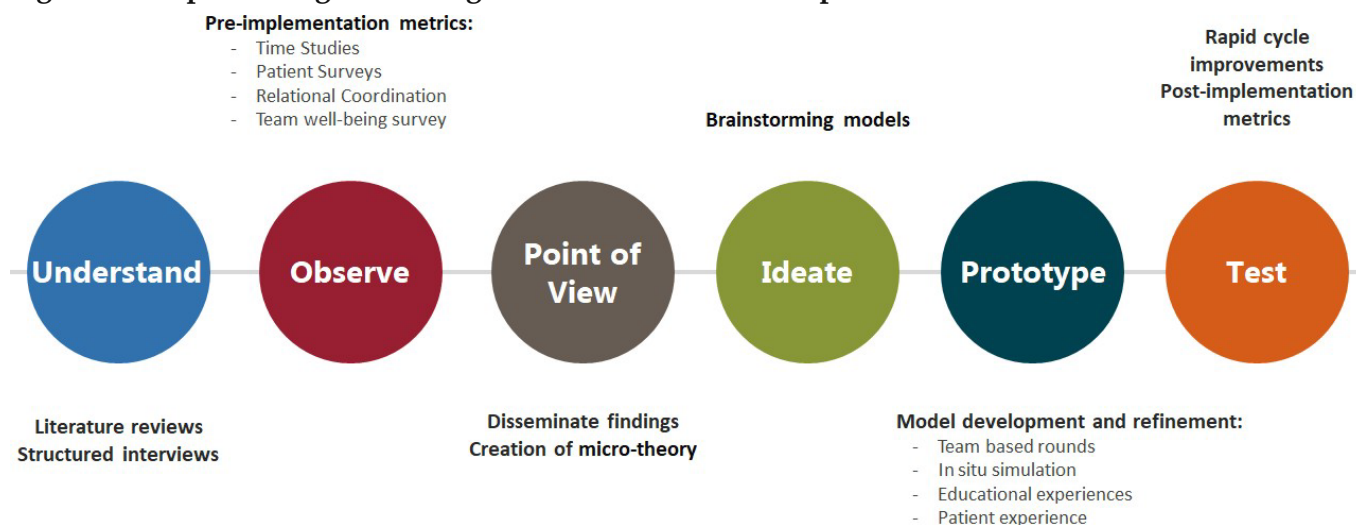
Expansion and Evolution of iPACE: Reimagining Residency

By 2019, the iPACE model had spread beyond the original iPACE pilot unit to the inpatient Family Medicine service at MMC and to Stephens Memorial Hospital's Intensive Critical Unit (ICU) and inpatient service. MMC leveraged the success of the iPACE pilot project and growing expansion and momentum of the model to apply for a prestigious American Medical Association (AMA) *Reimagining Residency* grant. ([Reimagining Residency Initiative](#)). MMC was awarded a \$2M grant to continue to expand and evolve the iPACE model. The project, "*iPACE Across, Out, and Over*" has the goal of creating generalizable core iPACE principles and spreading the model to inpatient units **across** MMC; **out** to outpatient and rural settings; and **over** into undergraduate medical educational to provide students with a strong foundation for IPCP. The iPACE principles were vetted and updated by a large interprofessional team in November 2019 to serve as the foundation of new adaptations of the model.

Critical to the expansion of iPACE is the customizability of the design based on each unique patient-care setting informed by the principles. Each iPACE model needs to be guided by the experiences of its own interprofessional team and must account for existing priorities and limitations. This requires study, refinement and optimization through scheduled interprofessional rapid cycle improvement sprints and identification of KPI goals relevant to the care, the patient setting and iPACE model.

As a way to provide a consistent, systematic approach to iPACE model implementation in new patient-care settings, the iPACE team adopted and adapted the Design Thinking (DT) framework^{16,17}. The implementation framework (Figure 2) employs a six-step process that engages interprofessional teams throughout the design of each new iPACE model. As in the pilot, the team develops its own learning laboratory where, together, staff and learners can observe, practice and improve healthcare delivery.

Figure 2: Adapted Design Thinking framework for iPACE implementation



Given the success of the iPACE pilot and expansion into the family medicine service and Stephens Memorial Hospital, there was enthusiasm from many MMC clinical leaders to become the next iPACE unit. In the spring of 2020, the iPACE team was poised to implement the DT framework to expand the iPACE model on several services including: Cardiovascular service, Cardiothoracic Surgery, Nephrology, and Medical Oncology. A fully developed unique iPACE model using DT had been created for Surgical Oncology service and had been poised to launch in March 2020.

Unfortunately, the onset of the COVID-19 pandemic halted much of this work before it reached implementation. The original iPACE unit was converted early in the pandemic to provide care for

“As the pandemic became a priority, we lost our cohorting, we were spread throughout the hospital, and a lot of those really deep relationships and cool projects we had started obviously took a back burner. We clung to as many of the guiding principles of iPACE as we could.”
-- Family Medicine Attending

COVID patients. However, the Family Medicine inpatient iPACE teaching service continued and was able to adapt to serve patients dispersed across the hospital, working with nurses unfamiliar with the model, in the setting of unstable nursing staffing, and ongoing outbreaks. As a result, the Family Medicine inpatient iPACE teaching service is the longest continuously operating iPACE model at MMC.

Within the last year, interest in the model has returned. The Pediatrics department developed their own unique iPACE model using DT and this was successfully launched in June 2021. Southern Maine Health Center (SMHC) has made iPACE adoption an annual implementation plan (AIP) goal and the iPACE team co-developed a unique iPACE model for that system. However, its launch has been delayed due to ongoing staffing shortages worsened by the pandemic. The iPACE team has also explored new partnerships including the development of a Surgical Intensive Care Unit (SICU) iPACE model and an iPACE-informed interprofessional Substance Use Disorder (SUD) recovery care team.

"COVID has been challenging in every element of life, iPACE included. I think that we have adapted the model well over the last couple of years. But, one of the most challenging parts of iPACE during the pandemic has been the changes to visitor restrictions. So much of the iPACE model is based around having the family present. That is truly one of the most valuable aspects of iPACE."

- Family Medicine Resident

"I know that at 10 or 10:30 the provider team will be there and I can get my questions answered. I could get my orders changed. Even for parents, before iPACE and throughout my day, I would be asked 'when are we going to see this doctor?' and now I can answer them. That feels really good; that feels like I am providing better care."

- Pediatric Nurse

The longitudinal outcomes from iPACE support the transition of iPACE from an innovative education research project to the catalyst to redesign inpatient healthcare delivery at MaineHealth. iPACE is how we collectively provide the best care to our patients, the best support to our teams, and the highest value to the health system.

"We are better together".

Proposal: Let's pick up the iPACE!

This proposal leverages the remaining funding from the AMA grant over the next three years to facilitate the transition of the iPACE model from an innovative medical education research project (*iPACE-Innovate*) to a coordinated, standardized initiative to redesign healthcare delivery across MaineHealth (*iPACE-Ops*). “**We are better together!**” is the motto that inspires this effort. The design and implementation of interprofessional team-based healthcare delivery models based on iPACE principles would need to look different in each patient care setting. Care team members will need to be engaged in co-creating team-based care delivery models based on the original iPACE ‘one patient, one round, one message, one team’ premise. The outcome data would need to be selected based on its relevance to the mission of each patient care setting. Patient safety and quality metrics will drive the redesign and refinement of the model. The time and resources available through AMA funding makes *now* the perfect time to *pick up the iPACE!*

Why do this?

The iPACE project is an example of how a successful local educational innovation to reimagine residency can be used as a catalyst for redesigning healthcare delivery. The iPACE model, principles, and proven outcomes align with:

- the **Quadruple Aim**
- the **MaineHealth mission** to educate tomorrow's caregivers
- other **MaineHealth initiatives**.

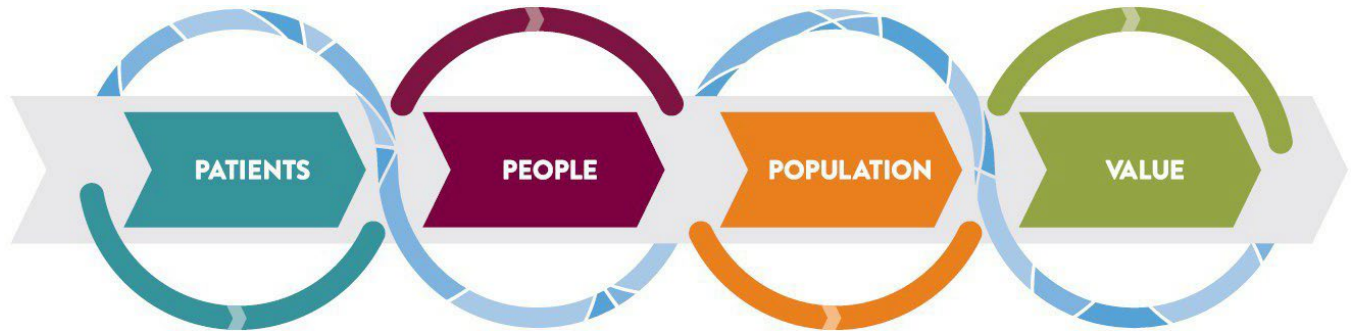
The Quadruple Aim

The quadruple aim has guided the development of both the design and evaluation of the iPACE model. iPACE model has and would impact MaineHealth’s strategic priorities – patients, people, population, and values – as described below.

Enhancing the experience of care for individuals

Patient safety, quality, and outcomes: Patient safety and quality improvement are prime principles in healthcare delivery at MaineHealth. It has been fifty years since the IOM³ recommended prioritization of IPCP as a successful strategy to increase the quality of care. The iPACE model and

principles support this quality improvement recommendation. iPACE pilot pre- and post-implementation survey data noted that care team members reported that the team was actively doing things to improve patient safety ($p=0.05$). Strong IPCP has been proposed as the way to break down silos and foster good communication, the creation of shared mental models and the culture of safety essential to quality patient care.



The emphasis on team-based improvement inherent in the iPACE model further fosters the development of KPI's that have real-world relevance to patients and providers.

Patient and family satisfaction: Patient and family satisfaction with the iPACE model has been exceptionally positive. With iPACE, patients fully engage with the interprofessional team in devising *their own* plan of care. The clarity of receiving **one message** from a cohesive team has been highlighted as a strength of the model.

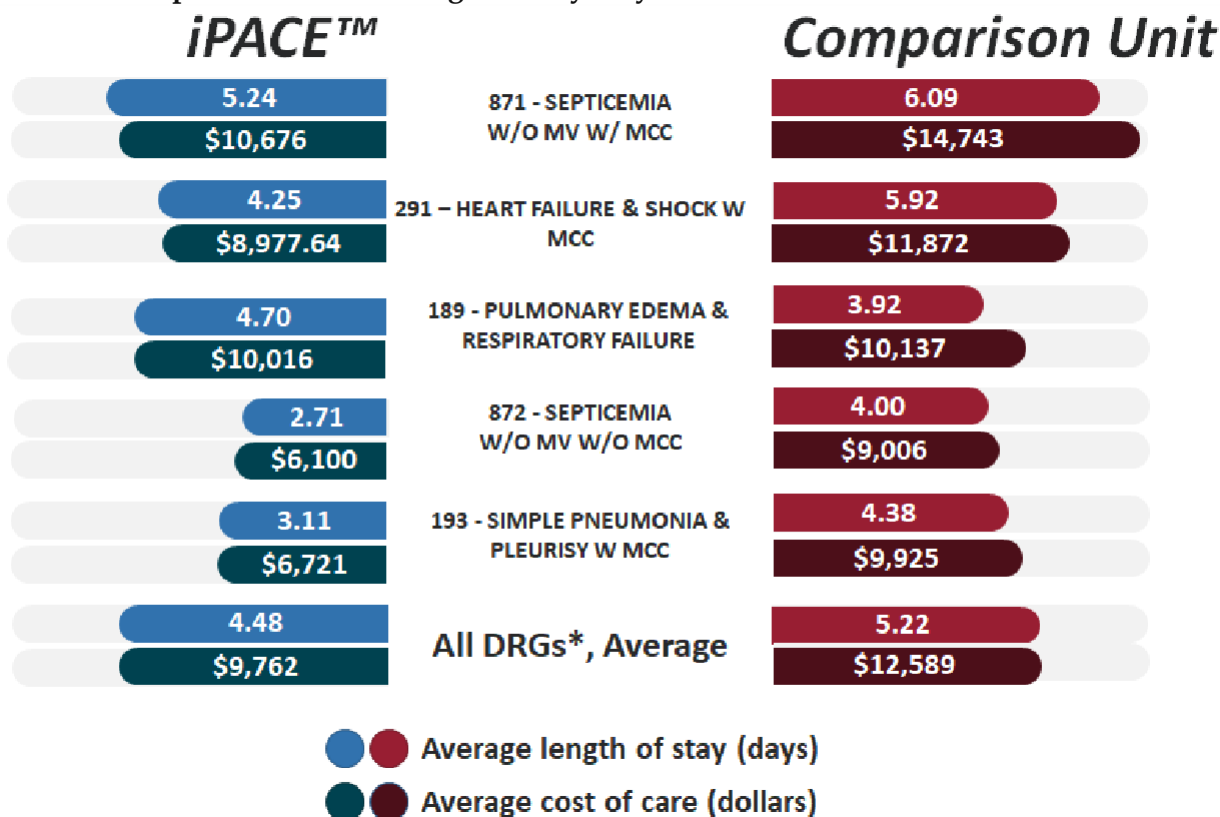
Reducing the costs of healthcare

The **MaineHealth Accountable Care Organization's** mission to engage and support providers, payers and community members in advancing integrated, value-based patient care falls in line with the iPACE principles. The iPACE model demonstrated sustained reduction in cost of care and length of stay. Data suggest that MMC would have had *savings of approximately 800 hospital days and \$2.7M in cost of care* for all DRGs had the iPACE model been

Value in healthcare: outcomes and patient experience balanced by the cost of care.

utilized by all medicine providers during the two-year pilot period (Figure 3), while improving care-team well-being and engagement.

Figure 3. Financial impact of iPACE on length of stay (days) and cost of care (dollars)



Data presented:

- Represents the period from October 2017 – September 2018
- 30-day readmission rates were utilized as a balancing metric and were not statistically different
- All DRGs found in the iPACE unit with a sample size of 3 or more cases for a total of 964 cases

Attaining joy in work.

One of the most noteworthy findings in the pre- and post-intervention survey on the iPACE pilot unit was that significantly more team members felt that their work experience was more professionally rewarding (p<0.0001). The iPACE pilot results also demonstrated significantly improved teaming scores in all seven domains of communication and relationships, which are key predictors for improved employee engagement and performance. Based on these data, implementation of the iPACE model should have a positive impact on team well-being, staff retention as well as reduce stress and burnout.

Improving the health of populations

The iPACE model also has the potential to impact population health. The development of an iPACE substance use disorder team should increase access to and improve the quality and standardization of care for this population. The iPACE model at Stephens is aiming to reduce readmission rates from skilled nursing facilities (SNFs) by including key interprofessional personnel from the facilities via telehealth during inpatient iPACE rounds. These are just two examples of the untapped potential of the model to improve the coordination of care across the continuum and address healthcare disparities.

Educating Tomorrow's Caregivers

With over 20 ACGME approved residency programs, the Tufts University School of Medicine Maine Track Program, partnerships with nursing and allied health programs across New England, and a robust pharmacy residency program, the spread of the iPACE model has the opportunity to shape the way our future care team members effectively work together so our communities are the healthiest in America.

Emphasis on teaming

The ACGME, through the Clinical Learning Environment Review (CLER) Program, has emphasized how the settings and health systems that train residents can shape their future values and performance. The ACGME recently added “teaming” to the six core elements of the CLER⁸ program. The iPACE model reinforces the IPEC competencies and trains future healthcare providers across the interprofessional spectrum to work collaboratively in teams.

Retention and recruitment

As approximately 50% of MMC residents and fellows stay to work at MaineHealth, there is a unique opportunity to train and nurture future healthcare providers to value and thrive in interprofessional teams. By creating and retaining a workforce of clinician educators who have been trained in the iPACE model, the iPACE principles and

“The concept of teaming recognizes the dynamic and fluid nature of the many individuals of the clinical care team that come together in the course of providing patient care to achieve a common vision and goals. It also recognizes the benefits of purposeful interactions that allow team members to quickly identify and capitalize on their various professional strengths—coordinating care that is both safe and efficient⁸.”

practices can be 'hardwired' and imprinted into future generations of clinicians for decades to come.

Scholarship

Operationalizing iPACE at the system level will continue to provide extensive opportunities for research in care pathways, undergraduate, graduate and interprofessional medical education, quality improvement and patient safety.

iPACE Supports Other MaineHealth Initiatives

Interdisciplinary Care Rounds (IDCR)

The iPACE model is complementary to the IDCR initiative in that it improves timely, efficient and safe discharges and transitions of care by incorporating the expertise of all team members in a structured, coordinated manner. iPACE and IDCR serve similar but distinct functions in healthcare delivery. iPACE is a comprehensive model of care and aims to bring all care team members to the bedside and conduct clinical decision making with the patient and family *to deliver* a cohesive plan of care. IDCR, on the other hand, serves as a touch point for professions *to ensure* the plan of care is on track and revised as changes occur. The alignment between these two initiatives is evident by the length of stay outcomes presented in Figure 3.

Magnet and Nursing Initiatives

MaineHealth has had the honor of being recognized as an [ANCC Magnet®](#) health system since 2006. Integral to the Magnet® philosophy is the development of nursing leaders and allowing these leaders to be "...empowered to find the best way to accomplish the organizational goals and achieve desired outcomes." The nurse/physician dyad integral to iPACE local leadership reflects this philosophy. The involvement of all members of the care team in the design, implementation, and improvement of iPACE units reinforces this standard for current and future healthcare team members.

How do we do this?

When iPACE was an innovative project (iPACE-Innovate), the six step Design Thinking Toolbox (Figure 2) was utilized to create each unique iPACE model. The framework focused on literature reviews to inform the model and extensive pre- and post-implementation data collection to report relevant outcomes. With the transition of iPACE from an innovation to a healthcare delivery model (*iPACE-Ops*), the DT six-step process would be condensed into a four-step process of model design that incorporates the iPACE core principles. Deliberate and continuous engagement of the interprofessional team and stakeholder groups would continue to shape new iPACE models and direct the collection of outcome data needed to refine the model design.

Appendix 1.

iPACE™: Interprofessional Partnership to Advance Care and Education

PREAMBLE

The interprofessional team includes diverse professionals whose main objective is to provide **excellent patient-centered** care while **respectfully** learning from, with, and about each other; **innovating** with one another; and **owning** their continuous improvement with passion and **integrity**.

CORE PRINCIPLES

- Patient-centered care that involves an interprofessional team that includes the patient and their family (**one team**)
- Intentional, structured collaborative team practice (**one round**)
- Full involvement of the care team in formulating and communicating patient-care plans (**one plan** that gives **one message**), with utilization of telecommunication technology as necessary
- Purposeful learning by the interprofessional team
- Co-location of patient and care team to optimize teaming potential
- Promoting team members' full scope of practice and well-being
- Commitment to and participation of the full team in rapid cycle improvement



However, in the *iPACE-Ops* process, design, implementation and refinement of the new iPACE units would be supported by the MaineHealth Integrated Quality and Safety Department and supported by the local Operational Excellence program in the form of project management support, unit-specific balanced scorecards, and relevant KPIs. Educational outcomes would remain a medical education research endeavor, which is also important to achieve the grant's obligations to the AMA.

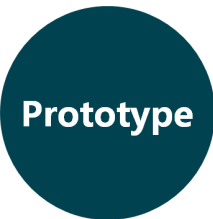
MMC and MaineHealth leaders will use their expertise and experience to determine the timeline and spread of the *iPACE-Ops* initiative at the institutional and system levels. However, a four-step approach to operationalizing *iPACE-Ops* model at the unit level is proposed below.



Understand current state. The iPACE team will gather information to better understand the existing rounding and care model of each unit. During this phase, educational materials, including videos, will be available to clinical leaders to provide background and a shared model of desired outcomes. The initial data collection process will consist of a standardized intake form, coupled with structured interviews with key leaders and stakeholders, and identification of patient safety and quality metrics. Findings will be disseminated amongst all key stakeholder groups for additional comments and feedback. The data will inform recommendations for the ideate phase.



Brainstorming model features. Instead of creating care delivery models *de novo*, the iPACE team will provide customizable templates of models that have been successfully implemented in similar units. Team design meetings will allow teams to choose the right template and to brainstorm key features unique to the patient care setting, team culture, and current problems. The outcome of this step will be unit-specific workflows that emphasize interprofessional team-based care and resources needed to implement the model. The iPACE team has developed resources (i.e., rounding schedule, IPE session guidelines, scripts) that can be easily adapted to meet specific needs. The first draft of the unique iPACE model will be shared with all key stakeholder groups for additional comments and feedback. The feedback will inform model refinement in the prototype phase.



Model refinement – it is all in the details! The prototype phase will provide the interprofessional team the opportunity to refine the model and outline the details and logistics of the various features (the schedule of the day, rounding script and format, patient orientation to care setting, documentation efficiencies, interprofessional educational experiences, and communication and logistics for daily operations). Resources (people, equipment, and software) will be identified and secured for launch. Communication and education for all staff and impacted departments will also be completed during this stage.



Don't let perfect be the enemy of better. The test phase will set the foundation and expectation for continuous improvement of healthcare delivery in each patient care setting. This phase is divided into three stages: (1) soft launch, (2) fine-tuning, and (3) stabilization. In the soft launch, the team will be able to trial the logistics and workflows of the model with a select number of patients. The fine-tuning stage will take place at full model implementation and will be characterized by just-in-time rapid improvement cycles. The stabilization stage will formalize the rapid cycle improvements by establishing short, scheduled, and structured interprofessional improvement meetings. At maturity, the team will be conducting larger quality improvement projects and utilizing KPIs to impact patient safety and quality metrics through the iPACE model.

Appendix 5 summarizes the similarities and differences of iPACE-Innovate and iPACE-Operationalize (*iPACE-Ops*).

Periodic reassessment of fidelity to the care delivery structure would be scheduled, including a focus on alignment with iPACE principles. Institutional metrics already available to leadership will enable evaluation of the impact of widespread adoption of an interprofessional iPACE patient care model has on a hospital. These include: financial metrics (length of stay and cost of care), staff retention, culture of safety, care team well-being and engagement, and patient experience. Incorporating iPACE at the institutional level would provide robust fodder for further quality and safety innovations and improve the interprofessional learning climate within the MaineHealth system. The lessons learned from the expansion of the iPACE model would result in best practices that can be shared within the system and will showcase at the national level the innovative work done at MaineHealth to improve patient care and collaborative practice.

MaineHealth is a values-based academic healthcare system, with a commitment to patient-centered, respectful, and high-quality care. Team-based collaboration is an essential component to the effective execution of the six values. The iPACE model is an innovative, locally- and nationally-endorsed interprofessional team-based care and education model that has successfully operationalized these values while improving the efficiency of care and optimizing patient and family experience. The success of iPACE as a focused medical education innovation should no longer be confined to small scale, grant funded projects. The iPACE model is ready to be the catalyst to redesign inpatient healthcare delivery at MaineHealth. iPACE is how we collectively provide the best care to our patients, the best support to our teams, and the highest value to the health system.



We are better together!

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Appendix 1. iPACE Preamble and Principles

PREAMBLE

The interprofessional team includes diverse professionals whose main objective is to provide **excellent patient-centered** care while **respectfully** learning from, with, and about each other; **innovating** with one another; and **owning** their continuous improvement with passion and **integrity**.

CORE PRINCIPLES

- Patient-centered care that involves an interprofessional team that includes the patient and their family (**one team**)
- Intentional, structured, and collaborative team practice (**one round**)
- Full involvement of the care team in formulating and communicating patient-care plans (**one plan** that gives **one message**), with utilization of telecommunication technology as necessary
- Purposeful learning by the interprofessional team
- Co-location of patient and care team to optimize teaming potential
- Promoting team members' full scope of practice and well-being
- Commitment to and participation of the full team in rapid cycle improvement

Appendix 2. Remaining AMA funding and transitional budget proposal

The iPACE grant has two and a half years of full funding to support this proposal as well as approximately four months of additional funding to support 1.9 Administrative FTE in Fiscal Year 2025 and a final grant funded retreat in the Fall of 2024.

Year 5 Budget transitions (August 1, 2023 – July 31, 2024)

Potential budget savings in grant year 5.

- Research Data Analyst transition: Secure institutional funds for reduction in data analyst support from 50% to 25%, with 1-yr transitional period for hand-off to MaineHealth Q&S data analyst. (\$26K)
 - o Any new data requests will be handled by MaineHealth Integrated Q&S
 - o Existing reports/dashboards will be handed off to MaineHealth Integrated Q&S data analyst during this time.
- Assistant Designated Institutional Officer (DIO): Secure institutional funds for Assistant DIO at .1 FTE. (\$25K)

Year 6 – No cost extension grant period (August 1, 2024 – January 31, 2025)

- Program Manager and Program Coordinator salaries covered for approximately 5 months of grant year 6 (\$90K). This is equivalent to a quarter of salaries (3 months) of funding for FY25.
- Grant funding would also be available for a funded retreat for Fall of 2024 (\$10K)

Grant year	Funding	Budgeted	Residual Operating	Residual Travel	Total Residual	Potential Savings
Year 2 (8/1/2020-7/31/2021)	\$360,000	\$262,434	\$72,566	\$25,000	\$97,566	\$0
Year 3 (8/1/2021-7/31/2022)	\$360,000	\$422,922	(\$62,922)	\$15,000	(\$47,922)	\$33,870 ^a
Year 4 (8/1/2022- 7/31/2023)	\$360,000	\$373,686	(\$13,686)	\$0	(\$13,686)	\$0
Year 5 (8/1/2023-7/31/2024)	\$360,000	\$379,884	(\$19,884)	\$0	(\$19,884)	\$50,884 ^b
6 months of Year 6 (8/1/2024-1/31/2025)	\$0	\$115,000 ^c	\$0	\$0	\$0	\$0
Grand Total			(\$23,926)	\$40,000	\$16,074	\$84,754

^a Budgeted, unfilled positions.

^b See Year 5 above.

^c See Year 6 above.

Appendix 3. Member organizations of the Interprofessional Education Collaborative (IPEC)



Appendix 4. Complete team functionality survey results of pre- and post-iPACE implementation

Measure	pre-iPACE^a Mean (SD)	post-iPACE^a Mean (SD)	p-value
Experience professionally rewarding	3.5 (1.00)	4.4 (0.62)	<0.0001
Improve medical documentation	3.6 (0.99)	3.0 (0.94)	0.01
Team communication	3.7 (0.81)	4.1 (0.84)	0.03
Team actively doing things to improve patient safety	4.0 (0.95)	4.4 (0.83)	0.05
Overall rating for patient centered care	3.9 (0.73)	4.2 (0.71)	0.07
Team will speak up about problems with patient care	4.2 (0.82)	4.5 (0.69)	0.08
Minimize redundant care processes	3.0 (1.09)	3.4 (0.98)	0.11
Mini-Z	24.8 (4.5)	23.6 (4.2)	0.22
Team relationship	3.8 (0.68)	4.0 (0.94)	0.31
Ability to make change for patient safety	3.9 (0.98)	4.1 (0.80)	0.33
Improve patient communication	3.8 (0.93)	4.0 (0.84)	0.34
Improve clinical reasoning	3.7 (0.92)	3.6 (0.79)	0.41
Improve skills teaching other health professionals	3.2 (1.15)	3.4 (1.17)	0.44
Communicate effectively with patients	4.1 (1.00)	3.9 (1.00)	0.47
Contribute to understanding clinical problem	3.9 (1.01)	4.1 (1.04)	0.48
Improve clinical knowledge	3.8 (1.07)	3.9 (1.21)	0.56
Respect patients' preferences	4.0 (0.99)	3.9 (1.06)	0.59
Ability to raise concerns about patient safety	4.4 (0.67)	4.5 (0.58)	0.64
Contribute to management plan	3.9 (1.06)	3.8 (1.14)	0.68
Overall rating for patient safety	4.0 (0.65)	4.0 (0.66)	0.73
Quality of professional education	3.5 (0.91)	3.5 (1.14)	0.83
Ability to identify threats to patient safety	4.3 (0.73)	4.4 (0.68)	0.84
Identify opportunities to improve care	3.5 (1.04)	3.4 (1.12)	0.95
Balance (patient care vs education)	2.5 (0.86)	2.5 (0.88)	1

^aLikert scale of 1 - 5, where 5 is strongly agree and 1 is strongly disagree

Appendix 5. Differences between iPACE-Innovate and iPACE-Operationalize implementation

Design Thinking	iPACE	iPACE-Ops	Modified Design Thinking
UNDERSTAND	Literature reviews Structured interviews	Define existing model - intake questionnaire - select interviews with key groups - disseminate findings to interprofessional team	UNDERSTAND
OBSERVE	Pre-implementation metrics: - time studies - patient surveys - relational coordination - team well-being survey		
POINT OF VIEW	Disseminate findings Creation of micro-theory		
IDEATE	Brainstorming ideas de novo	Team works with existing template options for interprofessional (medical, surgical, ICU, Peds, rural) and adapts template to meet unique unit challenges	IDEATE
PROTOTYPE	Model development and refinement: - team based rounds - educational experiences - patient experience - in situ simulation	Model refinement: - team based rounds - educational experiences - patient experience - in situ simulation	PROTOTYPE
TEST	Rapid cycle improvements Post-implementation metrics	-sustainability of model and PDSA tweaks - existing metrics* - KPIs relevant to the unit, in context of Operational Excellence	TEST

*HCAHPS, Mini-Z, RL solution reports, etc.