

The Future of Perioperative Medicine

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The cost of health care is unsustainable. By 2020, with approximately 50 percent of adults predicted to have one chronic disease and 25 percent to have multiple diseases, an estimated 19 percent of the United States gross domestic product will be devoted to health care. Additional burdens on the system are expected from an aging population, with Americans aged 65 years or older projected to reach \$55 million by 2020 and \$72 million by 2030. As a consequence, Medicare spending (Part A, B and D) is expected to be \$542 billion in deficit by 2025.¹

Surgical care, in particular, accounts for half of hospital admission expenses, with the rate expected to increase as the population ages. However, the majority of this spending comes from a smaller proportion of the population. For example, it is estimated that 32 percent of the U.S. population aged 65 years or older undergoes surgery in the year before their death. That fact, taken together with knowledge that the average cost of a surgical complication is approximately \$12,000 per event,² is cause for alarm. The opportunities to alter this cost trajectory and add value to the health care system are enormous.

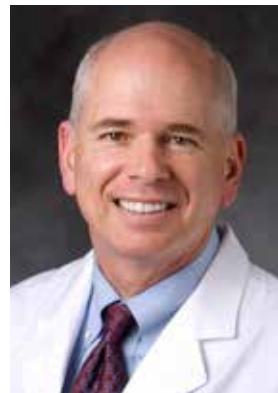
Homes, Enhanced Recovery and Beyond

The concept of a medical home or “Patient-Centered Medical Home” (PCMH) was first proposed in the late 1960s by the American Academy of Pediatrics and later adapted by the American Academy of Family Physicians to fulfill the goals

of the “triple aim.”³ The medical home concept has continued to evolve in primary care, and the traditional promise of cost savings from population health care within the PCMH model is being re-evaluated. It is now understood that the administrative overhead required to care for the largest (i.e., healthy) cohort of a population far exceeds the expected reduction in health care spending for that population segment. Currently, it appears that the asymptomatic early chronic disease cohort is served best by a traditional medical home model, whereas the opportunity for greatest impact may lie within the management of the most complex episodes for the sickest patients. In this latter cohort, early adaptation of multidiscipline-specialty driven, best practice-care design offers the greatest opportunity for value enhancement in population management. Since the recent introduction of the concept, we have seen several versions of the Perioperative Surgical Home (PSH) proposed as a surgical care model.^{4,5} It is noteworthy that individual programs have been received with varying degrees of acceptance and/or resistance. The concept of “Enhanced Recovery” after colorectal surgery was pioneered in the late 1990s⁶ in Denmark and has since expanded to other procedures throughout the world. Successful implementation of enhanced or accelerated recovery protocols portend decreased hospital length of stay and decreased postoperative complications. All require collaboration between surgeons, anesthesiologists and the perioperative nursing service to provide optimal perioperative care.



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Following early success at Duke with colorectal enhanced recovery⁷ and with interest to develop more comprehensive perioperative best practice care redesign, the Perioperative Enhancement Team (POET) was launched in 2012. The guiding principles of POET are to enhance the value proposition of perioperative care through a disciplined and multidisciplinary care re-engineering process. At Duke, POET has grown in scope and scale with support from other institutional key stakeholders, including general surgery, orthopedic surgery, gynecologic surgery, CT surgery, neurosurgery, neurology, hematology, endocrinology, gerontology, hospital medicine, hospital pharmacy and hospital administration.

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The collective competencies of a core team bring together strategy, operations, tactics, finance, workflow design, project management, information technology integration and data tracking. The POET process begins with generative discussion with an expectation for a supportive business case to implement care design change. Once the clinical outcome improvement and financial analysis are completed and judged to be compelling, care providers and clinical managers work with a project management team to redesign work streams and facilitate operational changes. At the same time, clinical metrics are developed and informatics resources are leveraged to enable continuous data tracking.

The first POET project was a preoperative anemia clinic (PAC). A proactive approach for perioperative blood management and reducing transfusion-related adverse outcomes requires the optimization of the patient’s preoperative red blood cell mass, thus avoiding the critical intra/postoperative

transfusion threshold decision altogether.⁸ Recognizing that preoperative anemia is one of the strongest predictors of perioperative transfusion, comparative research was first performed to determine the institution’s transfusion rate and procedure-specific triggers for transfusion. Volume projections for work flow and work need analyses were then conducted based on institutional historic rates of anemia. This was followed by a financial modeling of the anemia clinic’s impact. Subsequently, a comprehensive diagnostic and treatment workflow model was created, and downstream staff planning and training requirements were determined. Physical space options and needs for laboratory ordering, schedule integration and care team communication were also established before launching the program. Finally, patient education needs were assessed and met.⁹ Continuous data tracking and communication of program status are performed with a newsletter to all stakeholders describing progress and ongoing efforts.

Other POET projects aimed at risk stratification, risk reduction and care optimization of patients prior to surgery include a preoperative diabetes clinic, with the aim of enhancing glucose management in diabetic surgical patients at high risk

Continued on page 18



for perioperative infection and related adverse outcomes secondary to inadequate glucose control¹⁰ and the Patient Chronic Pain Management Center (PCPMC) for perioperative management of patients with complex pain syndromes. The PCPMC utilizes triggers¹¹ to identified patients likely to be high resource utilizers and re-engineers the perioperative care pathway for these chronic pain patients prior to and following elective surgery. In the spine optimization pathway, PCPMC plans to utilize telehealth visits before and after spine surgery. On deck, other risk reduction and care optimization concepts for POET include a preoperative nutrition clinic and a preoperative physical therapy clinic as a component of our preoperative optimization for senior health, or POSH, clinic.

Outside of the direct perioperative domain, POET initiated the Pain Assessment Risk Treatment for Novel Effective Recovery (PARTNER) program whereby “high utilizers” of the emergency department (ED) are identified and addressed. Hospitalists, anesthesiologists, neurologists and social workers collaborated to develop and implement an alternative clinical care pathway for patients with sickle cell disease, chronic headache disease and/or chronic pain with the goal to reduce avoidable ED visitation.

POET has also coordinated a multidisciplinary team to defined coagulopathy correction algorithms for hemorrhagic protocols in the setting of OB, CT surgery and trauma surgery as well as coagulopathy correction for hemorrhagic stroke. The Coagulation and Lysis Oversight Team, or CLOT, facilitates system development, dissemination and electronic medical record (EMR) integration of these protocols to monitor and thereby help ensure adherence.

Going forward, POET may contribute more broadly to population health management. Many patients with chronic disease only enter the health system when declared surgical. The Risk Evaluation-Care Optimization for Value Enhanced Recovery, or RECOVER, program could offer comprehensive preoperative management (where appropriate), dietary and/or smoking cessation counseling, preemptive muscular strength conditioning, and track compliance with preventive health care measures, including vaccinations, immunizations, blood pressure and lipid screening. In addition, POET proposes the Multidisciplinary Acute Postop Service (MAPS) Team. MAPS would engage vital contributions from surgeons, internists/hospitalists, anesthesiologists and nursing personnel to work as partners to provide effective care navigation and coordination,

ensuring adherences to enhanced recovery care maps, acute pain and acute or chronic medical condition management (exacerbated by the perturbation of surgery), and rehabilitation to facilitate throughput and expedited discharge.

In summary, the future of perioperative medicine will rely on, and be sustained by, the competencies of multiple disciplines and their respective coordination of care. This is especially true for patients with chronic and complex disease, whereby the greatest savings opportunity will be realized in reducing variation in care design and proactively engaging perioperative specialist teams to not just identify risk but to aggressively manage risk. The future of perioperative medicine is POETic.

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