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ANALYSIS

Navy Medicine Introduces Value-Based Health Care

ABSTRACT In 2016 the newly appointed surgeon general of the Navy launched a value-based health care pilot project at Naval Hospital Jacksonville to explore whether multidisciplinary care teams (known as integrated practice units, or IPUs) and measurement of outcomes could improve the readiness of active duty personnel and lower the cost of delivering care to them, their dependents, and local retirees. This article describes the formation of the project's leadership structure, the selection of four conditions to be treated (low back pain, osteoarthritis, diabetes, and high-risk pregnancy), the creation of the care team for each condition, outcomes and costs measured, and the near-term changes in outcomes during the twelve-month pilot period. Patient outcomes improved for three of the four conditions. We describe factors that contributed to the project's success. After the pilot concluded, the Navy combined the back pain and osteoarthritis IPUs into a single musculoskeletal clinical unit and established a similar IPU at another naval hospital and its clinics. The diabetes IPU was continued, but the high-risk pregnancy IPU was not. We offer several observations on the elements that were key to the success of the project, explore challenges and opportunities, and suggest that the pilot described here could be taken to greater scale in the Military Health System and elsewhere.

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The US Navy and Marine Corps are responsible for war readiness, ensuring the safety and security of American interests worldwide, sustaining global commerce, and providing emergency humanitarian relief and medical aid across the world.[1] In support of this mission, the Navy spent $9.5 billion in 2018 to deliver medical care to 2.8 million active duty Navy and Marine Corps personnel and their dependents, as well as retirees (health care represented about 5.5 percent of the Navy's total budget of $171.5 billion in 2018).[2] One-third of Navy care was delivered by 63,000 medical personnel at 128 naval health care facilities in the US and overseas, including two tertiary medical centers, sixteen other hospitals, two hospital ships, nine health clinics, and over one hundred branch medical/dental clinics; this is known as direct care.[3] The remaining two-thirds of health care was purchased from civilian systems.

Despite the Navy's substantial health care spending, at any given time approximately 10,000 sailors—equivalent to the staffing for two Nimitz-class aircraft carriers—were not available for duty because of illness or injury (as of May 2019 the Navy had eleven active aircraft carriers).[4] A 2014 Department of Defense review revealed that while the average quality performance in the Military Health System (MHS) was comparable to that of civilian health care, high variability occurred across facilities.[5]

Vice Admiral C. Forrest Faison III (one of the authors of this article) became the thirty-eighth surgeon general of the Navy in December 2015 and set out to improve Navy Medicine's performance and keep the Navy and Marine Corps "ready, healthy and on the job."[6] Faison launched a major initiative to apply the value-based health care (VBHC) model, to Navy Medicine.[7,8] Faison's initiative involved three of the key components of VBHC: forming multidisciplinary care teams, called integrated practice units (IPUs), to treat particular medical conditions; measuring and improving patient health outcomes for those conditions; and measuring the costs of treating patients over the cycle of care for each condition.

In this article we describe the IPU development and implementation process, early evaluation results, adoption and adaptations based on early experience, and lessons and challenges.

Launching The Value-Based Health Care Pilots

Between January and September 2016 Navy Medicine established the project's leadership structure, selected four high-impact medical conditions, formed IPUs for these conditions, and prepared to measure the outcomes and cost of treating each condition. Here we describe the implementation process that introduced the new care model.

ESTABLISH A LEADERSHIP STRUCTURE Faison wanted the new care model to be used not just for a few conditions at a single site, but as a prototype that could be applied to many conditions across multiple naval hospitals. He made several choices that would facilitate rapid adoption from pilot to scale. Faison selected Naval Hospital Jacksonville as the site for the VBHC initiative. Jacksonville, a 256-bed facility in Florida, was the Navy's third-largest hospital serving over 300,000 service members, dependents, and retirees. It had a track record of innovation and successful pilot projects that were later implemented across Navy Medicine.[9,10]

Faison designated Captain David C. Collins, who had prior change management experience at another naval hospital and was Jacksonville's incoming commanding officer, to be the initiative's on-site leader. Navy Medicine contracted with the Johns Hopkins Applied Physics Laboratory (APL) for project design and implementation consultation, as well as to provide staff support for the project.

Collins selected two full-time on-site project managers: a senior health systems engineer and government project manager in the Performance Improvement Office in the Navy Bureau of Medicine and Surgery, and an experienced APL senior health systems and project engineer. The three constituted the VBHC core team, charged with managing the design and rollout of the pilots, as well as coordinating research and communications and providing monthly progress updates to Faison. The core team met formally each week and on an ad hoc basis daily.

To secure engagement and commitment from a broad representation of Navy personnel, Faison assembled a central working group to provide overall direction and high-level decision-making support for the initiative. This group consisted of two admirals representing Navy executive leadership and two Navy Medicine regional leaders from Navy Medicine East and West, the two stateside Navy divisions. Also included were functional subject matter experts and clinical specialists (see the organizational chart in online appendix exhibit 1).[11] Consultants delivered a full-day training session on VBHC principles to the core team and central working group. The central working group met weekly for the first six months, and then biweekly and monthly.

SELECT MEDICAL CONDITIONS The central working group spent its first few months selecting the medical conditions for the project. It identified conditions with the highest incidence and the highest spending among active duty and non–active duty patients (exhibit 1).

Four conditions were selected because of their effect on readiness, spending, volume, and opportunity for care improvement based on the availability of evidence-based care pathways (estimates of total spending at Jacksonville in 2016, including direct and purchased care, are shown in parentheses):[12] low back pain ($6.4 million), osteoarthritis ($11.7 million), diabetes ($5.1 million), and pregnancy ($3.3 million). Given the high prevalence of anxiety and depression among both active duty and other populations, mental and behavioral health treatment were embedded within each of the four pilots.[13]

CREATE INTEGRATED PRACTICE UNITS Collins appointed physician and nurse co-champions to lead a working group for each condition (exhibit 2). The co-champions then recruited team members including other physicians and nurses, nutritionists, mental and behavioral health specialists, and physical therapists. Each team included the diverse clinical expertise and experiences required for the comprehensive and integrated management of the medical condition across its cycle of care and was tasked with designing the IPUs. The working groups received a half-day training session by external consultants on VBHC principles, which all hospital staff were also invited to attend. The IPU

working groups met weekly to define the specific eligibility criteria for patients to be treated by the IPU; the evidence-based care treatment pathways; the outcome metrics for the condition; and the location, structure, and schedule of the clinic. An APL health systems engineer was assigned to each IPU working group to develop meeting agendas, schedule meetings, perform clinical literature reviews, analyze patient population data at Jacksonville, and coordinate the flow of information among IPU team members.

After the design phase, a multidisciplinary clinical team (exhibit 3) was formed for each IPU. A hospital corpsman (an enlisted medical specialist) served as the care navigator for patients. The IPU clinical teams met weekly to monthly, depending on the IPU, to discuss individual patients, especially to develop alternative treatment plans when the prescribed clinical pathway did not produce the expected improvements. For example, if necessary, a patient could be referred to a specialist, such as a spine surgeon, who was affiliated with the IPU but not a full-time clinical team member. These meetings also enabled IPU teams to modify clinical pathways based on patients' experiences and preferences. Additionally, ancillary teams, such as radiology and clinical pharmacy, were affiliated with the IPU to promote awareness and care continuity.

SELECT AND MEASURE OUTCOMES Each IPU team selected process, clinical, and patient-reported outcome (PRO) metrics for its condition based on a review of the clinical literature and consultations with medical specialty societies, drawing on outcome standardization organizations such as the International Consortium for Health Outcomes Measurement. Traditional quality metrics, such as Healthcare Effectiveness Data and Information Set (HEDIS) measures, also continued to be collected.

A constraint was the inability to integrate PRO metrics into the Navy's legacy electronic health record (EHR) platform, or for the EHR to report aggregated clinical and process metrics. Also, naval security regulations would not allow clinicians to use web-based software to ease data collection. Corpsmen and clinical champions had to collect PROs on paper forms and manually review patients' charts to extract condition-specific clinical and process metrics.

The working groups decided not to establish a randomized control group of patients for several reasons. The clinical teams would be using feedback from team members, interim patient outcomes, and patients' preferences to modify staffing, eligibility, scheduling, and care pathways during the project. Such changes would nullify a stable treatment group. They also did not want to deny any eligible patient access to the anticipated superior care from the IPU teams' use of evidence-based pathways, which reduced care variation and fragmentation. Finally, APL statisticians advised that the sample sizes and time periods required to achieve statistical significance of comparison-group differences would be challenging to achieve, given the size of IPU patient populations at Jacksonville and the pilot's one-year duration.

EXHIBIT 1

Highest-volume medical conditions at Naval Hospital Jacksonville, by volume among active duty patients, January 2015–April 2016

	Number of patients	
Condition (diagnosis-related group)	**Active duty**	**Non-active duty**
Chronic back pain	4,152	8,524
Nondependent abuse of drugs	2,268	3,221
Hyperlipidemia	1,889	9,301
Cold/cough/URI/UTI	1,716	10,384
Adjustment reaction	1,493	2,160
Hypertension	1,435	11,551
Anxiety	929	3,305
Episodic mood disorders	759	1,725
Pregnancy	614	2,303
Depressive disorder, not elsewhere classified	473	1,773
Anemia	417	2,489
Substance abuse	414	—[a]
Sexual deviations and disorders	289	—[a]
Chronic obstructive pulmonary disease	239	1,624
Neurotic disorders	239	—[a]
Kidney disease	228	1,485
Hypothyroid	216	2,725
Diabetes	196	4,755
Osteoarthritis	187	2,146
Sleep disorder	173	—[a]
Attention deficit hyperactivity disorder	—[a]	1,466
Asthma	—[a]	1,271
Hyperkinetic syndrome of childhood	—[a]	1,219

SOURCE Authors' analysis based on internal Naval Hospital Jacksonville documents. **NOTES** For conditions in the non–active duty population, the volume significantly dropped off after the nineteenth condition, so only the top nineteen are listed. URI is upper respiratory tract infection. UTI is urinary tract infection. [a]Condition not among the twenty most prevalent among active duty or non–active duty patients.

MEASURE COSTS Jacksonville's existing costing system could not trace costs accurately to individual patient encounters. In response, Collins appointed a dedicated costing team to implement time-driven activity-based costing[14] at all four IPUs. Led by a consultant with costing expertise, the team included members from each working group.

Time-driven activity-based costing is a methodology that calculates costs based on the actual clinical and administrative processes used in

EXHIBIT 2

Integrated practice unit (IPU) working group structure in the Navy Medicine value-based health care pilot

	Working group			
Team member	**Diabetes**	**Low back pain**	**Osteoarthritis**	**Pregnancy**
Primary care/internal medicine physician (MD)	•	•	•	•
Nurse	•	•	•	•
Behavioral health specialist	•	•	•	•
Care navigator	•	•	•	•
Nutritionist	•		•	•
Laboratory specialist	•	•		
Wellness nurse (RN)	•	•	•	
Obstetrician (MD)				•
Midwife				•
Clinical pharmacist	•	•	•	
Pain management physician (MD)		•	•	
Physical therapist		•	•	
Orthopedic surgeon (MD)		•	•	
Radiologist (MD)		•	•	
Neurologist (MD)		•		
Sports medicine physician (MD)			•	
Diabetes educator (RN)	•			
HEDIS champion	•			
Patient	•			

SOURCE Authors' analysis based on internal Naval Hospital Jacksonville documents. **NOTES** Circles indicate that a group has the indicated team member. HEDIS is Healthcare Effectiveness Data and Information Set.

each patient's complete cycle of care and the actual quantity, type, and cost of employees and other resources used in each process step. The costing team completed its work for all four IPUs over eight months.

LAUNCH THE INTEGRATED PRACTICE UNITS After seven months of planning, the IPU pilots went live in October 2016. The working groups recruited patients based on data in the Military Health System EHR (for example, high hemoglobin A1c for diabetes patients and specific comorbidities for osteoarthritis) as well as from referrals by primary care providers. Some IPUs relaxed eligibility criteria from those selected at the pilot's onset to increase patient volume. For example, the diabetes IPU team lowered the minimum HbA1c eligibility level from 9.0 to 7.5 to permit more patients to join (of note, the level subsequently had to be reinstated during the pilot because volume became too great for the IPU to manage). By the completion of the pilot, all new enrollments in the IPUs came via referrals by patients' physicians.

Each IPU scheduled its clinic based on the availability of clinical team providers and the number of patients enrolled. The diabetes and low back pain IPUs saw patients four half-days per week, while the osteoarthritis and pregnancy IPUs offered two half-day clinics per month.

Prior to their initial visit, patients filled out questionnaires that included baseline PROs. At the visit, a corpsman enrolled the patient and provided basic education about the IPU. For the osteoarthritis, pregnancy, and diabetes IPUs, the patient then met sequentially with each member of the clinical team over a two-to-three-hour period. For the low back pain IPU, the patient had a single appointment with a physical therapist within seventy-two hours of enrollment in the IPU. When these meetings were concluded, the corpsman scheduled subsequent appointments. At each subsequent meeting, clinicians used PROs to focus discussions on metrics showing poor progress. The frequency of subsequent meetings, and the providers seen by patients, were based on the individual patient's needs. Some IPUs had initially overestimated the needed frequency of patient visits, leading to extra IPU costs and inconvenience for patients.

As the pilots progressed, IPUs modified several care pathways and outcome metrics, guided by APL staff members' analysis of process, clinical, and PRO measures. The osteoarthritis IPU, for example, modified the initial visit protocol to have the patient see all providers at the same time, rather than sequentially. The change was made in response to patients' feedback expressing a preference to tell their story only once and hear the various providers discuss and collaborate on their care plan. Learning that some diabetes patients could benefit from bariatric surgery, the IPU began to refer appropriate patients to a nearby weight loss clinic that could optimize their perioperative care. The diabetes IPU also formed a partnership with ophthalmology at Jacksonville to achieve 100 percent compliance for routine annual eye screenings.

Early Results And Findings

Early results from the IPU teams are described below and shown in appendix exhibit 2.[11] As previously noted, the results could not be statistically analyzed to isolate program effects, although they suggest topics that could be studied more formally in future research.

In the low back pain IPU, patients experienced faster time to diagnosis than pre-IPU patients (4.6 days versus 13.1 days). Patients' Oswestry Disability Index, which measures disability on a scale of 0 (least disability) to 30 (most disability),[15] decreased by an average level of 13, which exceeds the minimal clinically important difference (MCID) of 8 for this condition. (MCID is the clinical threshold for when a medical intervention produces a change in outcomes large

EXHIBIT 3

Integrated practice unit (IPU) clinical team structure in the Navy Medicine value-based health care pilot

	Core clinical team			
Team member	**Diabetes**	**Low back pain**	**Osteoarthritis**	**Pregnancy**
Primary care/internal medicine physician (MD)	•			
Sports medicine physician (MD)			•	
Obstetrician (MD)				•
Doctor of physical therapy (DPT)		•		
Nurse (RN)	•	•	•	
Nurse midwife (RN)				•
Wellness nurse (RN)				•
Physical therapist		•	•	
Behavioral health specialist	•	•	•	•
Care navigator	•	•	•	•
	Ancillary clinical team			
Psychiatrist (MD)	•	•	•	•
Optometrist/ophthalmologist (DO/MD)	•			
Pain management physician (MD)		•	•	
Orthopedic surgeon (MD)		•	•	
Radiologist (MD)		•	•	
Neurologist (MD)		•		
Neurosurgeon (MD)		•		
Wellness nurse (RN)	•	•	•	
Diabetes educator (RN)	•			
Nutritionist	•	•	•	•
Laboratory specialist	•			
Clinical pharmacist	•	•	•	

SOURCE Authors' analysis based on internal Naval Hospital Jacksonville documents. **NOTE** Circles indicate that a group has the indicated team member.

enough to be perceived by patients.)[16] Patients spent 60 percent less time in physical therapy (fifty-four days versus ninety days pre-IPU), which increased readiness by allowing them to return to active duty faster. Patients also achieved almost complete elimination of morphine use (from a mean morphine equivalent dose of 2.7 mg per patient per month, pre-IPU, to 0.25 mg per patient per month). Of the 201 patients enrolled in the low back pain IPU, 68 graduated from the program with their symptoms resolved.

In the diabetes IPU, patients experienced an average decline in HbA1c levels of 2.5 percentage points (from 10.6 percent, pre-IPU, to 8.1 percent). Professional Quality of Life Scale (ProQOL)[17] scores showed improvement in quality of life and ease of disease management.

In the osteoarthritis IPU, average hip disability and knee injury osteoarthritis outcome scores (known as HOOS Jr. and KOOS Jr.)[18] increased from 46 to 59, exceeding the MCID threshold of 8. The percentage of patients enrolled with appropriate imaging increased from 62 percent in the pre-IPU period to 76 percent.

In the high-risk pregnancy IPU, twelve of fifteen patients delivered at term at Jacksonville rather than at a civilian hospital, and they made greater use of behavioral health and nutrition resources.

Limitations in the hospital's existing costing system prevented the project from rigorously comparing the costs of IPU treatment to pre-IPU costs. Overall, quarterly costs, as measured by time-driven activity-based costing, declined during the pilot. Lacking baseline information, however, we cannot know whether end-of-year costs were lower than pre-IPU costs. The new costing approach will provide baseline data for tracking progress in future years and for similar IPUs established at other Navy hospitals.

Postpilot Responses

Upon completion of the twelve-month pilot, the leadership teams decided to merge the low back pain and osteoarthritis IPUs into a single musculoskeletal IPU at Jacksonville, and its scope was expanded to include upper back, neck, knee, and shoulder pain. All of these conditions could be treated effectively using the same clinical pathways and with similar clinical and behavioral resources.

Navy Medicine established new musculoskeletal IPUs, using Jacksonville's clinical pathways and personnel mix, at Camp Pendleton naval

hospital and its outlying clinics, which serve one of the highest concentrations of active duty Marines.

The diabetes IPU continued to operate, registering ongoing improvements in patient outcomes and satisfaction, until September 2018, when care for all military dependents and retirees was transferred, to transition toward the mandate in the National Defense Authorization Act for Fiscal Year 2017, to the Defense Health Agency. Navy Medicine stopped the diabetes IPU to allow the agency to develop its own uniform diabetes care model, building upon Jacksonville's experience.

The high-risk pregnancy IPU was discontinued because of high variability in the condition, limited patient volumes, and some leadership weaknesses.

Observations

Navy Medicine leadership evaluated the introduction of Jacksonville's new health care delivery model as a success, pointing to the improved outcomes from the low back pain, osteoarthritis, and diabetes IPUs and the expanded scope and scale of the new musculoskeletal IPU. Several factors can be identified as contributing to this assessment.

CLEAR LEADERSHIP STRUCTURE The pilot benefited from a well-defined leadership structure and process at multiple levels. The most senior health care officer in the Navy, Surgeon General Faison, sponsored the project, and the project leader was the site's commanding officer, with experience in change management. These two leaders received continual support from two senior staff members with strong project management skills. The central working group included members with subject-matter expertise, institutional knowledge, and authority to scale the pilots quickly.

All members of the leadership teams understood and were personally committed to the initiative's central goals of improving the readiness of the active duty force and the health of dependents and retirees.

The leadership teams made high-level decisions about IPU selection, ensured that adequate resources were provided, and provided high-level monitoring of the performance of IPU working groups. They decentralized detailed planning and implementation to the IPU working groups, which decided where, when, how, and to whom the care would be delivered. Local IPU clinical teams, staffed with experts from the multiple disciplines and from different backgrounds, delivered the care. The low back pain working group, for example, appointed a doctor of physical therapy to be medical co-champion, signaling that therapy, not surgery or medication, was the preferred treatment option.

Leadership teams met frequently and were continually available for bilateral communications with the local working groups and clinical teams. This allowed resolution of concerns such as workload and incentives for IPU personnel. All of these factors allowed the new care delivery model to be implemented without encountering typical resistance to change.

INTEGRATED PRACTICE UNIT SELECTION CRITERIA The three successful IPUs shared several important features: clear alignment with the Navy's mission to improve readiness and lower the total costs of care; high patient volumes; readily available outcome measures; the existence of standardized, evidence-based clinical pathways; and duration of care cycles that enabled useful feedback to clinicians.

▶ **MISSION ALIGNMENT:** Navy Medicine has a clear focus on improving access to care and outcomes for its covered population. The Navy spends up to $100,000 per person to train new recruits for active service. With 10,000 sailors currently on the sidelines for health reasons, the Navy has a $1 billion investment in human capital stranded and unavailable for work. The low back pain IPU addressed the number-one cause for unavailability, or degraded capabilities, of active duty personnel. Mental health care treatment for conditions such as depression, representing some of the most prevalent conditions among active and non–active duty personnel at Jacksonville, was embedded within each of the four IPUs.

▶ **HIGH VOLUME:** Diabetes, low back pain, osteoarthritis, and pregnancy are among the most prevalent conditions in Navy Medicine's covered population. Improving the treatment of these high-volume conditions offers opportunities for greater efficiency and a large potential impact on the Navy's health care spending.

▶ **AVAILABLE OUTCOME MEASURES:** The central working group purposefully selected conditions with outcome measurement tools that were well accepted by the clinical community. This allowed IPU working groups to quickly agree on the outcomes and the processes used to measure them. The three successful IPUs had pre-IPU data against which improvement could be tracked and improved. Choosing conditions for which no well-established outcome measurement existed would have required more time up front to develop new measurement processes, leaving less time to realize improvements.

▶ **CARE STANDARDIZATION OPPORTUNITIES:** The successful IPUs, while treating well-defined medical conditions, had high current treatment

variability and care fragmented across multiple clinicians and staff. For example, providers who joined the diabetes IPU had been using more than forty-five different care pathways. Each IPU drew upon current best practices and scientific literature to establish standardized clinical and behavioral treatment by collaborating multidisciplinary teams. The successful IPUs ultimately converged around a single care pathway, with the clinical teams able to adapt the pathway for the few patients for whom the pathway was not working or inappropriate. Reducing treatment variability for high-impact medical conditions contributed to better outcomes being achieved faster.

▶ **CARE CYCLE DURATION:** Improving the treatment of diabetes, low back pain, and osteoarthritis could deliver near-term improvement in patient outcomes in periods measured in weeks and months (with additional benefits to be realized in future years). The one-year pilot gave the successful IPUs several cycles of feedback from outcome measures to use in improving care.

TERMINATION OF THE HIGH-RISK PREGNANCY UNIT The high-risk pregnancy IPU was discontinued for several reasons. The central working group had defined the condition as "pregnancy," a high-volume condition, affecting readiness and morale among active duty forces. The IPU's decision to narrow the scope to high-risk pregnancy caused the number of patients treated to be too small to achieve meaningful results. In addition, it involved several different complex conditions, each requiring different treatment. Also, pregnancy's long natural treatment cycle meant that few outcomes were available during the twelve-month pilot to drive care improvement. Finally, unlike the three other IPUs, the high-risk pregnancy IPU had leadership turnover during the project, and its members had lower commitment to the IPU care model.

Challenges, Opportunities, Next Steps

CHALLENGES The VBHC initiative described in this article had several limitations. Some could be overcome, while others warrant further research and attention.

First, the legacy health information systems at Jacksonville complicated implementation. Clinicians and patients could not use tablets or portable workstations to enter data since the hospital had inconsistent or limited access to WiFi or cellular services. As a consequence, personnel had to use handwritten medical records and PROs for data collection and review. The IPUs could not modify the information technology system to customize electronic scheduling, monitoring, and communication with patients, leading to time-consuming and higher-cost work by IPU personnel, which would be mitigated in the case of organizations with more advanced information technology infrastructure.

Second, primary care providers, separate from IPUs, had concerns about losing patients to the IPU, adversely affecting their scope of practice. Physicians working within the IPU also felt the potential for decline in measured productivity since their IPU patients were sicker and required more of their time. Collins spent considerable time speaking with both groups and provided "safe harbor" protection from decreases in the relative value unit productivity metric for those working in the IPU.

Third, with the existing military costing system not being accurate at the condition level, the IPUs could not compare patient costs in the IPU with those incurred pre-IPU. The costing information, available only at the project's end, could not be used by the IPUs to reduce costs, redesign processes, or identify staff working below the top of their licenses. The availability of time-driven activity-based costing information at the condition level should be valuable, in future studies, to optimize care over the patient's care cycle and to compare and improve costs across multiple sites.[19,20] Additionally, future improvement efforts should institute time-driven activity-based costing in advance of a pilot to facilitate evaluation costs.

Fourth, the impact of the IPUs on outcomes and costs was not statistically validated. Once the Navy has stabilized the staffing and clinical pathways for treating a medical condition, it could consider a field experiment with random selection of personnel between IPU-treated and conventionally treated patients to quantify the magnitude and significance of changes in outcomes and cost.

OPPORTUNITIES AND NEXT STEPS The Jacksonville experience suggests several opportunities that the Navy, Department of Defense, and others might consider. As a concrete first step, Navy Medicine could continue to extend musculoskeletal IPUs to all hospitals and clinics serving active duty personnel. This could reduce the large number of personnel currently not available for mission-related activities and expand the opportunity to conduct further research on the intervention.

The goals and outcomes of the IPU project are also consistent with broader objectives of the Defense Health Agency as mandated in the National Defense Authorization Act for Fiscal Year 2017, particularly with respect to the aims of readiness, efficiency, and seamless care through integration. Under this mandate, the Defense

Health Agency could establish an Office for Value-Based Health Care Innovation with a mission to accelerate the adoption of integrated care delivery models across military treatment facilities. Such an office would provide leadership and expertise to help each facility introduce IPUs for high-volume, high-cost conditions, along with the tools to measure and compare improvements in readiness, outcomes, and cost across the Military Health System.

At a broader level, given the positive experience with this value-based health care pilot, the Navy's implementation model could serve as a model for other organizations, including the Veterans Health Administration and those in the private sector, that are interested in new ways of organizing, measuring, and improving the care they deliver to patients. ■

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11 To access the appendix, click on the Details tab of the article online.

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