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Controversies

A “Top Five” list for emergency medicine: a policy and research agenda for stewardship to improve the value of emergency care ☆

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ABSTRACT

United States health care costs are growing at an unsustainable rate; one significant contributor has been the overuse of health services. Physicians have a professional ethical obligation to serve as stewards of society's resources and take responsibility for health care costs. We propose a framework for identifying overused services and a research and implementation agenda to guide stewardship efforts to demonstrate the value of emergency care. Examples of interventions to reduce the cost of emergency care along six value streams are discussed: laboratory tests, high-cost imaging, medication administration, intravenous fluids and medications, hospital admissions and post-discharge care. Structural and political hurdles such as the Emergency Medical and Active Labor Act mandate, medico-legal concerns, lack of provider knowledge about costs and economic conflicts are identified. A research agenda focused on identifying low value clinical actions and potential interventions for overuse reduction is detailed. A policy agenda is proposed for organized emergency medicine to convene a structured, collaborative process to identify and prioritize clinical decisions that are of little value to patients, amenable to improvement through standardization, and actionable by front-line providers. Emergency medicine cannot wait longer to identify areas of low value care, or else other groups will impose external standards on our practice. Development of a Top Five list for emergency medicine will begin to demonstrate our professional ethical commitment to our patients and health system improvement.

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1. The imperative for emergency physician stewardship

The cost of health care in the United States is growing at an unsustainable rate. Historically physicians have practiced in a manner that focuses on individual patient's health without including the implications these decisions have on public or social resources. Norman Livinsky clearly articulated this view in 1984: “When practicing medicine, doctors cannot serve two masters. It is to the advantage both of our society and of the individuals it comprises that physicians retain their historic single-mindedness. The doctor's master must be the patient” [1]. In 2010, Howard Brody, a prominent medical ethicist argued that physicians have a professional ethical obligation to serve as stewards of society's resources and take some responsibility for health care costs [2]. He called upon medical specialty societies to develop “Top Five” lists of tests and treatments

that are frequently performed, high-cost, and “that have been shown by the currently available evidence not to provide any meaningful benefit to at least some major categories of patients for whom they are commonly ordered” [2]. The American Board of Internal Medicine's “Choosing Wisely” campaign recently answered this call by mobilizing 34 medical specialty societies to release Top Five lists by the end of 2013 [3]. The specialty of emergency medicine, represented by the American College of Emergency Physicians, joined the Choosing Wisely campaign in February of 2013 despite initially deciding to forgo on campaign membership in the fall of 2012 [4]. This decision creates a tremendous opportunity for emergency physicians to set a research and policy agenda to begin with a Top Five list as a start to identifying low value care.

As the pressure to reduce health care spending increases, other groups such as private insurers, government regulators and other medical specialties will be willing and able to implement policies to reduce the cost of emergency care. This pressure is illustrated by Washington State's recent efforts to broadly minimize Medicaid patients' access to the emergency department (ED) [5]. Payers are also defining measures of appropriate tests, such as the recently proposed Center for Medicare and Medicaid Services imaging utilization measure “Use of Brain Computed Tomography in the Emergency

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Department for Atraumatic Headache" (OP-15) that was unable to garner National Quality Forum endorsement [6]. **Emergency physicians have an ethical obligation of stewardship to our patients and to society to address the cost of care, and as experts in emergency care we should define the measures of appropriateness for tests and procedures. We propose a framework for identifying overused services and a research and implementation agenda to guide this demonstration of the value of emergency care.**

2. Identifying overuse in emergency care

Given the diversity of patient populations and clinical conditions seen by emergency physicians, attempting to compare and prioritize the relative impact of overused services will be challenging. Should emergency physicians focus on reducing high-cost imaging in a narrow group of patients or high quantity (low unit cost) blood tests across a wider population? Should we reduce referral for needless outpatient follow-up, or reduce admissions for conditions that could be discharged home?

We propose using a framework that is organized along specific emergency care value streams in order to **select tests, treatments, and disposition decisions that are of little value to patients, amenable to improvement through standardization, and actionable by front-line providers.**

2.1. Laboratory tests

In 2010, 42% of ED patients had at least one blood test performed [7]. Many such tests are ordered as part of "routine" or "screening" labs or in chief complaint-based order sets, and are often ordered by protocol, sometimes from triage. The ease of obtaining blood and the ready availability of laboratory facilities with rapid turnaround in the ED helps reinforce overuse patterns. Despite decades of research documenting its lack of diagnostic accuracy for conditions ranging from appendicitis to other bacterial infections in the ED, the complete blood count (CBC) stubbornly remains part of "routine labs" and is often used to screen for infection [8-10]; **37% of ED patients have a CBC drawn during their ED visit** [7]. Similarly, coagulation studies, which are rarely of value in patients without a significant hemorrhage or an acquired or suspected coagulopathy, were acquired in 8% of ED patient in 2010, and are considered unnecessary in 70% of admissions from the ED [11]. These proportions may seem small at first, particularly to emergency physicians practicing in tertiary referral or trauma centers; however, when considering that nationally only 13% of patients are admitted to the hospital and that the median ED has annual volume of 20,351 visits, these are remarkable figures [12]. Likewise, while the standard unit charges used for these tests by the Centers for Medicare and Medicaid Services (\$12.02 for a CBC and \$7.30 for a Prothrombin time/INR [13] seem negligible in isolation, their high frequency results in large associated costs. The list of lab tests which are used much more widely than there is evidence to support use is broad and ranges from newer proprietary tests such as brain natriuretic peptide to older tests such as the erythrocyte sedimentation rate (ESR) and blood cultures [14-17]. Many lab tests may be performed to provide physicians and patients "reassurance" in the setting of ED evaluations that are perceived to be abbreviated or by a care provider with whom they have no previous relationship. **We must refocus our efforts to provide what most patients actually seek – doctoring –empathic listening, physician examination, and clear communication, rather than using technology as a crutch.** Tools such as computer enabled clinical decision support can provide immediate evidence- feedback on appropriateness and cost to ordering providers and can reduce orders for inappropriate lab tests [18-20].

2.2. High-cost imaging

In response to high costs and the risks associated with ionizing radiation and intravenous contrast exposure imaging overuse has become a national priority [21]. **National studies demonstrate that ED use of computed tomography (CT) has increased by 330% to 51 million annual studies since 1996, without an increase in diagnostic yield** [22,23]. In a large study of commercially insured patients, imaging costs grew over 100% in the past decade—a rate of growth that persisted regardless of age, insurance type or disease [24]. The pressures behind this trend will continue as patients and providers look to EDs to serve as the primary acute diagnostic center. Well-validated clinical decision rules such as the Ottawa ankle rules, the NEXUS or Canadian Criteria for cervical spine imaging, and the Wells Score for pulmonary embolism have been shown to safely decrease imaging in clinical trials, but are not widely used in practice [25-27]. For some conditions, such as pulmonary embolism, recent data suggest that one third of CT studies may be avoidable, and interventions that combine evidence-based clinical decision rules with point-of-care decision support have been shown to safely reduce chest CT use in these patients [28,29]. Identifying specific indications and patient groups in which imaging can be safely minimized should be a primary focus of emergency physicians seeking to develop a Top Five list for cost reduction.

2.3. Medication administration and prescribing

Over 75% of ED patients are administered or prescribed a medication during their ED visit, some of which are inappropriate or avoidable [7]. For example, studies document the **emergency providers both overuse antibiotics for upper respiratory tract infections and acute bronchitis and discharge elderly patients with multiple medications from the ED that are potentially harmful** [30,31]. Efforts to reduce the volume of low-value medication prescriptions, which place patients at risk of adverse drug events, represent an actionable opportunity for cost reduction and quality improvement in the ED. Overuse of opioids and antibiotics leads to patient harm in addition to the direct costs. Recent policy efforts directed at favoring generic drug use and rational prescribing programs have reduced costs [32]. All 20 of the most frequently prescribed drugs in the ED are available in a generic formulation, and 10 of these medicines are available as part of \$4 drug programs at large national retailers. Given the association between medication costs and patient adherence to discharge prescriptions, emergency physicians can play an important role in stewardship by engaging patients in discussions that maximize the use of generic or discount prescriptions [33].

2.4. Intravenous fluids and medications

Placement of an intravenous line and administration of intravenous fluids is *de rigor* for almost all ED patients with complaints ranging from abdominal pain or vomiting, to chest pain. In 2008, **27% of ED patients received intravenous fluids for which the minimum Medicare Ambulatory Payment Classification for an IV injection is \$35 and \$127 for one hour of an IV infusion**, and many departments have done extensive documentation projects to capture revenue associated with IV therapy [34]. The potential to reduce overuse is large as a recent study demonstrated that **fifty percent of intravenous cannulas inserted in the ED went unused** [35]. The potential overuse of IV therapy goes beyond fluids to medications such as antibiotics [36]. In fact, 9 of the 20 most frequently administered medications in the ED are usually given intravenously rather than orally [7]. If emergency physicians regularly ordered oral medications that have been shown to have equal clinical effectiveness, such as corticosteroids for asthma exacerbations or quinolone antibiotics, then meaningful IV associated costs could be avoided [37]. Also, nursing initiated treatment

protocols for common conditions such as gastroenteritis that begin with oral rehydration and oral anti-emetics, while removing default IV order sets, enable EDs to facilitate more timely treatment and reduce IV infusion costs [38].

2.5. Hospital admissions

The decision to admit a patient to the hospital is the single most expensive decision that emergency physicians make. Over one half of hospital admissions in the United States now originate in the ED [39]. The average cost of inpatient hospitalization is \$1853 per day across the United States, but ranges from \$985 to \$2696 across states [40]. Studies have shown that geographic, institutional and provider specific variation in rates of admission from the ED for Medicare beneficiaries overall and for specific conditions such as pneumonia [41,42]. Although some variation can be explained by patient disease severity and social factors, much of the variation cannot. Emergency physicians can improve the efficiency of health care delivery by using critical pathways for outpatient management of select conditions [43]. By applying evidence-based clinical decision rules such as the Pneumonia Severity Index for community acquired pneumonia, emergency physicians can safely risk-stratify patients and identify those suitable for outpatient management [44]. While such pathways are not perfect predictors of risk, the true question is how they perform compared to current practice and what is the cost of current practice. Stewardship opportunities also exist in better application of rapid diagnostic and treatment pathways through observation care, which can provide outcomes equivalent to inpatient admission at lower costs for many conditions [45].

2.6. Post-discharge care

The ability of the ED to serve as the definitive site of care is a potential value stream for emergency care. National data from 2010 reveals that 85% of patients seen in the ED were discharged to home, but only 6% were discharged without a recommendation for planned follow-up [7]. There has been virtually no research to date studying the role or need for post-emergency department care for many self-limited conditions, which leaves emergency physicians facing a tension between coordinating with a patient's outpatient providers and recommending low-value follow-up appointments. Some emergency physicians feel obliged to universally recommend follow-up to compensate for poor care coordination or in fear of medical liability in the case of a bad outcome. Yet, outpatient visits are potentially avoidable after many common, self-limited ED conditions such as viral processes or a low-grade sprained ankle, which will improve on its own with no evidence to suggest any benefit from a follow-up with a primary physician or orthopedist. Similarly, scheduled return ED visits for conditions such as simple wound checks that are amenable to patient self-assessment are avoidable. Given the national primary care shortage, and the average \$70 cost for an ambulatory care visit, emergency providers could free up significant capacity in the health care delivery system by providing definitive diagnosis, treatment and patient education for self-limited conditions.

3. Potential barriers to emergency physician stewardship

Taking accountability for the costs of emergency care will not be easy. As a specialty, we are under public attack from both payers and politicians who frame the emergency department as purveyors of low-value, high-cost care that is often inappropriate [46]. Many emergency physicians feel that our work environment is unique and includes many forces that drive overuse including the Emergency Medical and Active Labor Act mandate, variation in patient severity, lack of access to follow-up care, the requests of referring physicians, consultants or admitting physicians, and patient preferences. While

personal anecdotes illustrate each of these examples, this does not refute recent estimates that one fifth of the overall medical services delivered in the United States are of little or no value to the patient, and could safely be eliminated [47]. Emergency physicians' obligation to patients: *primum non nocere* or "first do no harm" is aligned with the role to be stewards of society's resources.

Many emergency physicians cite medico-legal motivations for overtesting. The evidence regarding liability's contribution to "defensive medicine" has been equivocal [48], and emergency physicians are sued at the same rate as the medical profession's average [49]. More importantly, the assumption that additional testing provides medico-legal protection, to our knowledge, has not been demonstrated in any medical specialty to date. If testing or treatment is done in patients in whom evidence shows no value for example in patients who pass the NEXUS or Canadian C-spine rules, then it does not reduce legal risk. Furthermore, there is no evidence that tort reform alone would eliminate "defensive" medicine [50]. Regardless of legal liability, emergency physicians find themselves under pressure to test due to their personal risk tolerance, professional culture or to avoid the emotional costs associated with the stress, time and reputational damage that follow litigation from a missed diagnosis. The high degree of variation found between providers caring for the same population under the same malpractice environment shows that individual practice patterns are more important determinants of medical service use than medical liability [41]. As the patient's agent, physician's greater understanding of the downstream risks associated with avoidable, or "defensive", tests should prevail in the physician-patient interaction. Conversely, the success of patient engagement campaigns such as Choosing Wisely may change patient expectations and leave emergency physicians more vulnerable to medical liability risk due to the unintended consequences of avoidable tests.

Emergency physicians may find addressing resource stewardship challenging due to poor knowledge about health care costs and lack of applicable cost data [51,52]. Most physicians cannot estimate personal utilization or appropriateness for use of specific tests or treatment. While some critics note that the charges and actual costs of emergency care are not well correlated, this is immaterial to the imperative for stewardship. Measuring the costs of care is a complex endeavor. Deciding whose cost perspective to measure, the institution's, the patients, the payers, or society's, and deciding who is responsible for each avoidable cost in a confusing cost-accounting system will needlessly detract from the goal. Focusing on reducing overuse by reducing charges allows emergency physicians to improve the affordability of care for patients.

Stewardship will be challenging given some inherent economic conflicts. Increased testing augments visit complexity which garners higher evaluation and management fees, and many hospitals may look upon EDs that reduce admissions or imaging unfavorably given the pressure to generate revenue from fixed assets. Emergency medicine can counter this conflict by advocating for the development of distinct billing codes that favor stewardship by reimbursing the use of clinical decision rules, providing payment for chief complaint based episodes of care, or even participating in the shared savings programs in which hospitals have recently been engaged [53]. Emergency physicians may find engaging patients in shared decision making challenging. Patient satisfaction is a common quality metric in emergency medicine and many physicians have incentive-based compensation based on their patient satisfaction scores. There is reasonable concern that reducing testing, IV treatment and admission may put physicians in conflict with patients leading to decreased satisfaction. An essential component of the Choosing Wisely campaign has been the expectation of physician and patient agreement to avoid low-value tests and treatments. The traditional paternalistic health care model, in which doctors order tests and inform patients of the results afterwards, is evolving toward a patient-centered model that emphasizes autonomy, informed consent, and empowerment [54].

Successful patient engagement in the ED can be challenging for physicians who lack the trust gained by a longitudinal patient relationships, the time needed to effectively explain the harms and benefits of each high-cost test and the tools to effectively communicate with a diverse patient populations with varying levels of both English and health literacy. Encouragingly, research has shown that shared decision making tools that engage patients in testing decisions for conditions as serious as myocardial infarctions have demonstrated equivalent clinical outcomes and reduced testing and hospitalizations while improving patient satisfaction [55]. **Emergency physicians should advocate for payment systems that reward engaging patients in testing and treatment decisions in a manner that maximize patient-oriented outcomes while reducing health care spending.**

Many of the interventions and scenarios presented in this proposal highlight the poor knowledge translation of longstanding clinical guidelines to change physician behavior [56]. A meaningful Top Five list for emergency medicine will need to address this challenge by assessing the actionability and feasibility of proposed interventions to ensure that traditional barriers do not preclude success.

4. A research agenda to promote stewardship

The concept of physician-led resource stewardship is not new, yet to implement such a change in practice will require new research. The current clinical research paradigm focuses on efficacy—which patients will benefit from an intervention by studying the treatment in a tightly defined population. Similarly, quality improvement research identifies patients who have not received evidence-based actions and to improve compliance with recommended care. The research needed to demonstrate stewardship, however, is distinct because it will begin with the hypothesis that specific interventions provide little value and potential harm to patients, and then use structured methods to demonstrate this clinical waste. Comparative effectiveness methods, such as non-inferiority trials, can help define tests or treatments with equal efficacy at lower cost. Emergency care researchers have a long tradition of using LEAN process improvement to reduce operational waste [57]. A similar focus on clinical waste would be a starting point for translating new research directed at improving stewardship.

There are many research gaps that investigators can address. First, the identification of low value interventions based on the aforementioned value streams will focus stewardship efforts on meaningful targets for cost reduction. Clinical decision rules are the most familiar method to define such groups in a clinical setting. Second, implementation studies that determine the predictors of physician and patient engagement, as well as tools that successfully support behavior changes, will be important to demonstrate that stewardship is actionable. Such tools will need to be built in a manner that engages both the referring physicians and consultants with whom emergency physicians interact to ensure that stewardship is a shared goal across a patient's care team and not a reshuffling of cost-accountability. Finally, future research should develop tools that can consistently abstract patient preferences and then be used in clinical care to ensure patient engagement and improved patient-oriented outcomes.

Creating a Top Five list will stimulate a set of research priorities directed at understanding the current magnitude of overuse, the drivers of this overuse and the clinical and economic implications of these care patterns. This new body of literature will likely demonstrate many more than five opportunities to reduce overuse and improve the value of emergency care.

5. The Top Five list: a suggested path forward

An emergency medicine Top Five list alone will not solve the national health care cost crisis. However, a top 5 list represents an

important statement of purpose, showing that emergency physicians are serious about stewardship and reducing waste. **While some will suggest that emergency care is different, either due to the Emergency Medical and Active Labor Act mandate, legal liability, crowding or a lack of definitive evidence to proceed, we believe that emergency physicians are best positioned to identify and define waste in our practice.** As the ACEP' statement of values affirms, "Emergency physicians have the responsibility to play the lead roles in the definition, management, evaluation, and improvement of quality emergency care." **If we abdicate this prerogative, others will step into the void: whether it is CMS, commercial insurers, or other physician specialty societies.**

Waiting for future research to initiate action, or denying that cost-effective care is a physician's obligation is no longer tenable—many other specialties have demonstrated their ability to make insightful recommendations. The decision by ACEP to join the Choosing Wisely campaign represents just the beginning for organized emergency medicine—all of the primary physicians, nurses and physician assistant societies should use the Top Five list as the beginning of the journey towards resource stewardship. Unlike the ad-hoc or unstructured processes used by other specialties, emergency medicine has the opportunity to set the standard and demonstrate that organized, collaborative assessment can identify evidence-based practices that are highly actionable by front line providers. This process must not only identify high-cost tests and interventions that lack an evidence base to suggest value but also identify changes in practice that emergency physicians feel is feasibly within their control. The first step would be a review of the scientific and economic evidence to identify potential low value activities. This process should use the many content experts who are Society of Academic Emergency Medicine members as well as existing expert committees within the American College of Emergency Physicians. Once a consensus Top Five list is generated, organized emergency medicine should develop and promote a quality improvement campaign designed to help emergency physicians improve the affordability of care. The Choosing Wisely campaign demonstrates the feasibility of professional societies in guiding this process, and organized emergency medicine could serve an important role as convener of a registry enabling both performance measurement as well as public reporting of these measures in programs such as the CMS Value Based Payment Modifier.

Physician specialty societies have traditionally advocated for their members livelihood, as a traditional guild does, so there is a real conflict. One mechanism that could be used to minimize the influence of reimbursement considerations on the selection of a Top Five list would be to set up an independent review and recommendation workgroup to select tests or treatments that currently erode the value proposition of emergency care. The specialty societies would be given the option of voting for or against the entire group of the Top Five, but not influencing its contents. A similar process has been used when selecting military bases for closure in order to avoid conflicts of interest by individual members of Congress.

6. Conclusion

Demographic trends ensure that the use of emergency care will continue to rise in coming years. Society is pressuring the health care delivery system to address rising costs by demonstrating the resource efficiency and clinical effectiveness of our decisions. Emergency Medicine has a professional ethical responsibility to be stewards of society's resources and improving the value of care. It is critical to establish explicit targets and goals in order to measure improvement and hold ourselves accountable. **As Don Berwick has famously said, "some is not a number, and soon is not a time" [58]. Establishing a list of tests, treatments and clinical decisions which are avoidable is the first step to addressing stewardship in emergency care.** If the specialty

does not lead the way, others, whose interests and expertise are not aligned with emergency patients or providers, will impose cost standards on emergency care.

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