

# Measuring Value for Low-Acuity Care Across Settings

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Increasing healthcare costs have created an emphasis on improving value, defined as how invested time, money, and resources improve health. The role of emergency departments (EDs) within value-driven health systems is still undetermined. Often questioned is the value of an ED visit for conditions that could be reasonably treated elsewhere such as office-based, urgent, and retail clinics. This paper presents a conceptual approach to assess the value of these low-acuity visits. It adapts an existing analytic model to highlight specific factors that impact key stakeholders' (patients, insurers, and society) assessments of the value of ED-based care compared with care in alternative settings. These factors are presented in 3 equations, 1 for each stakeholder, emphasizing how tangible and intangible benefits of care weigh against direct and indirect costs and how each perspective influences value. Aligning value among groups could allow stakeholders to influence each other and could guide rational change in the delivery of acute medical care for low-acuity conditions.

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Healthcare expenditures in the United States reached \$2.6 trillion in 2010, nearly 18% of gross domestic product (GDP).<sup>1</sup> Rising costs have led to discussion about value—how invested time, money, and resources improve health. An Institute of Medicine roundtable advocated rewarding “value over volume,” compensating effective care, not “more care.”<sup>2</sup> The Affordable Care Act (ACA) also supports the concept through value-based purchasing, accountable care organizations, and bundled-payment programs.<sup>3</sup>

The role and measurement of value in healthcare is just emerging.<sup>4-7</sup> There has been little focus on measuring value in emergency departments (EDs), where 28% of acute care in the United States occurs.<sup>8</sup> One subset of ED visits for which value is questioned is low-acuity encounters, often perceived by media, insurers, researchers, and emergency physicians as inefficient resource use.<sup>9-12</sup>

These visits are controversial for several reasons. Terms like *unnecessary*, *avoidable*, *preventable*, *ambulatory-case sensitive*, *inappropriate*, *non-urgent*, and *low-acuity* lack precise definitions and are used interchangeably despite subtle differences. They may refer to encounters for conditions that are not life-threatening, not time-sensitive, capable of improving without intervention, or better suited for different settings. They may suggest visits preventable through better primary care or public health measures or those for alternative purposes like seeking food, shelter, or narcotic medication.

Assessing urgency is also itself controversial. Urgency is complicated *ex ante* by its subjective and dynamic nature. A prudent layperson patient may perceive symptoms as urgent that a doctor does not.<sup>13-16</sup> Highly trained providers make inconsistent assessments of urgency at triage,<sup>17</sup> and even emergency physicians sometimes alter their initial assessments of urgency after ancillary testing data.<sup>14</sup> Urgency is complicated *ex post* by retrospective measurement. Final diagnoses do not always reflect the potential acuity of presenting complaints.

The estimated range of low-acuity visits (8%-50%) is wide, underscoring the difficulty in quantifying this problem.<sup>18-22</sup> The cost associated is unknown, though comparing these figures with total US emergency care expenditures of \$51 billion suggests a span of \$4 to \$26 billion.<sup>23</sup> In addition to variability in measuring the impact of low-acuity visits, discussion of this topic often fails to account for perspective—while payers prefer to limit expensive

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care, patients may desire immediacy or lack alternatives.

This paper aims to better the understanding of service setting and value for low-acuity encounters by adapting an existing business model to highlight qualitative and quantitative factors that affect key stakeholder perspectives (patients, insurers, and society). Finally, we discuss how aligning value among groups could guide stakeholders to influence each other and create rational change in the delivery of care.

### Value Model

In business, it is axiomatic that success requires producing value for customers. Although economics in medicine are distorted by the amorphous nature of health, the disconnect between patient expenses and those of third-party payers, and a lack of transparency, the goal of creating value remains unchanged. The Customer Value Equation by Heskett et al models customer perspective and is used to explain the success of companies in industries from airlines to auto insurers<sup>24,25</sup> (Figure 1).

In Heskett's equation, results are the quantity and quality of products. Process quality is customer experience: *tangibles* (appearance of personnel/facilities), *reliability* (dependable, accurate performance), *responsiveness* (timeliness and willingness to help), *assurance* (staff knowledge and ability to inspire trust), and *empathy* (caring, individualized attention).<sup>26</sup> Price is what the customer pays for the product. And, access cost denotes what the customer must do to acquire it (travel time).

We adapt this equation to low-acuity encounters to understand how setting and perspective affect value (Figure 2). The numerators represent *outputs* of care (benefits) and the denominators *inputs* (costs), highlighting the concept that, regardless of perspective, value varies directly with costs and benefits (Table 1). To simplify discussion, we assume patients desiring care will receive it somewhere and not avoid care entirely.

### Patient Value

Conscious and unconscious value assessments guide patients in choosing care setting. Table 2 summarizes variables that impact the Patient Value Equation (PVE). To understand how setting influences these variables, one must consider the characteristics and available resources of each (Table 3).

**Output: Outcomes as perceived by patient.** Patient perceptions dictate the outcome of the PVE. Some patients are less concerned with traditional quality indicators than the impact on their physical and emotional well-being. For exam-

### Take-Away Points

By adapting an existing analytic model, this paper highlights how key stakeholders (patients, insurers, and society) assess low-acuity medical care, and suggests the following:

- The value of using the emergency department for low-acuity visits depends on perspective taken.
- Both perceived and actual benefits and costs may push patients toward a specific setting for low-acuity medical conditions.
- Modifying the system to create net-positive value for each stakeholder group could increase the likelihood of sustainable change.

ple, a patient with a urinary tract infection may be unaware whether she received the recommended antibiotic; however, she is undoubtedly conscious of whether and how quickly her symptoms subsided.

Patients often equate “more” care with better care.<sup>27,28</sup> A patient with an upper respiratory infection may prefer knowing that a chest x-ray is normal to having a clinical diagnosis alone. The result is that immediate capabilities, medications, and on-site consulting specialists in EDs may enhance their appeal.

**Output: Patient experience.** Patients likewise value the experience associated with obtaining care—distance to care, facility quality, and staff courtesy. Patients cite non-clinical factors as playing a larger role than clinical reputation in guiding care site selection.<sup>29,30</sup> A need for after-hours care or safety net, difficulty obtaining traditional appointments, and a desire for immediate care drive patients to the ED.<sup>31,32</sup> Over time, patients may also develop loyalty to a particular care site based on positive prior experiences.

Survey data on factors that make patients choose retail and urgent care is lacking. Expanded service hours, same-day access, convenient locations, and minimal wait times could play a role. Yet some patients still prefer EDs to alternative settings. One survey concluded that patients were willing to pay an additional \$31 to see physicians in a non-retail setting compared with nurse practitioners in a retail setting.<sup>33</sup> Shortages or outright absence of retail and urgent care settings in medically underserved areas may also restrict alternatives to the ED.<sup>34</sup>

By comparison, office-based practices offer a longitudinal, established relationship with providers. Difficult same-day access may outweigh this benefit. Patients report a willingness to pay an additional \$82 to be seen the same day rather than to wait 1 or more days.<sup>33</sup> This perspective is understandable considering that patients in significant pain may prefer early evaluation over a familiar provider.

■ Figure 1. Heskett's Customer Value Equation<sup>32</sup>

$$\text{Value} = \frac{\text{Results} + \text{process quality}}{\text{Price} + \text{customer access cost}}$$

■ **Figure 2.** Proposed Healthcare Value Models

Patient Value =	$\frac{\text{Outcomes as perceived by patient + patient experience in process}}{\text{Out-of-pocket costs + opportunity costs}}$
Insurer Value =	$\frac{\text{Effect of outcomes on future costs + patient satisfaction with plan}}{\text{Cost of care + opportunity costs}}$
Society Value =	$\frac{\text{Effect of outcomes on productivity + citizen satisfaction with health}}{\text{Taxes devoted to healthcare + opportunity costs}}$

■ **Table 1.** Value as a Relationship Between Costs and Benefits

Cost	Output	
	Increase	Decrease
<b>Increase</b>	Larger increase in cost than output = Value decreases Larger increase in output than cost = Value increases	Value decreases
<b>Decrease</b>	Value increases	Larger decrease in cost than output = Value increases Larger decrease in output than cost = Value decreases

**Input: Out-of-pocket costs.** The denominator of the PVE includes inputs of care, or costs. Patients are often responsible for only a portion of direct expenses such as deductibles, co-payments/coinsurance, and a percentage of charges, depending on insurance status. Premiums likely have less impact on patient value because they are sunk costs already paid and unchanged regardless of utilization.

Some data suggest patient finances have minimal impact on seeking care. In a survey of ED patients, few rated ability to pay as an influence on setting selection despite perception that alternative care sites are cheaper.<sup>32</sup> Lack of insurance may not drive ED utilization, as visits have risen most among the insured.<sup>35-38</sup> ED visit out-of-pocket payments may be minimal for certain insured patients whose insurers pay the bulk of the cost and for certain uninsured patients whose EDs do not collect payment during the visit or pursue collections aggressively. Although several studies show reduction in ED utilization at higher copayments, the effect has been inconsistent.<sup>39-43</sup>

Few comparative data are available on the impact of patient costs in alternative settings. Uninsured or underinsured plans may limit access to office-based practices. Insurance coverage for retail visits is limited but expanding.<sup>44</sup> However, retail clinic users are less likely to be poor and may be able to

afford care regardless of coverage.<sup>34</sup> Also, transparent pricing at retail clinics may be alluring, as patients can predict their out-of-pocket payment.

**Input: Opportunity costs.** Indirect costs of seeking care are an important element of care-setting selection. These opportunity costs include hourly or self-employed workers who lose income receiving treatment during work hours or families who incur child care expenses for similar waits. Treatment in office-based settings may require visits to multiple venues (reference laboratory, outpatient radiology facility, etc) to complete a work-up compared with a single ED visit. Although opportunity costs remain difficult to quantify, they play a role in patient value and should not be ignored.

By comparing patients' perceptions of benefit and costs of care, the PVE provides a framework to discuss how patients obtain care. It demonstrates that components are dynamic and vary by illness, community, patient personality, and beliefs.

**Insurer Value**

Despite similarities to the patient equation, the Insurer Value Equation (IVE) reflects several key differences.

**Output: Effect on future healthcare use.** The numerator still reflects outcomes of care but gauges results by whether

## Value Model for Non-Urgent ED Visits

■ **Table 2.** Components of the Patient Value Equation Variables, in No Specific Order

Outcomes	Experience	Out-of-pocket Costs	Opportunity Costs
Cure or treatment (measured by quality-adjusted life-years)	Ease of access (distance, wait times, insurance status, language)	Deductible	Missed work
Primary, secondary, and tertiary prevention	Patient expectation of outcomes vs actual outcomes	Copayments or coinsurance	Child care
Alleviation of pain and discomfort	Quality of facilities Level of technology	Health maintenance (medicines, nutrition, exercise)	
Reassurance (knowledge of diagnosis and prognosis)	Staff (professionalism, knowledge, courtesy)		
Education regarding medical condition	Time to definitive diagnosis (single vs multiple visits)		

they prevent future healthcare consumption and fulfill contractual obligations more than their effect on patients' physical and emotional states.

Few quality metrics exist for low-acuity conditions; however, 1 study compared ED, urgent care, retail, and outpatient clinic quality and showed similar overall results among the settings, with ED outcomes being slightly poorer than others.<sup>45</sup>

Little is understood about how low-acuity visits impact future consumption. An upper respiratory infection will likely self-resolve such that receiving care may have little effect on future health. This visit may present scant benefit to the insurer.

Insurer type may also impact benefit. Private insurers and Medicaid presumably see limited enrollment duration and younger populations than Medicare. Treatments and preventive strategies with delayed effects are less likely to affect future healthcare consumption while still enrolled in the former plans. This suggests that private insurers and Medicaid are disproportionately affected by short-term future healthcare consumption while Medicare may inherit long-term consumption.

**Output: Patient Satisfaction.** The IVE proposes that patient satisfaction with the plan and care benefits the insurer. In particular, the provider network, scope of coverage, and options for care settings may affect satisfaction. Dissatisfied patients or employers may change plans, reducing profits and market share. Thus, outcomes independent of effect on future consumption indirectly affect insurer value.

Competition for government insurance may not be driven by patient satisfaction given that generally poor or elderly populations often lack alternatives. These plans may also be incentivized to reduce the number of enrollees to save taxpayer funds.

**Input: Insurer expense.** Direct expenses to insurers include payments for care and related administrative expenses. Some data suggest that higher expenses in EDs reduce the value of this setting to insurers. In 2003, median payments for ED visits across the spectrum of severity were \$299 while office-based visits were \$63.<sup>46</sup> Studies on common retail clinic conditions found average payments (patient plus insurer combined) of \$383 to \$570 for EDs, \$159 to \$166 for physician offices, \$144 to \$156 for urgent care clinics, and \$104 to \$110 for retail clinics.<sup>45,47</sup>

**Input: Opportunity costs.** Opportunity costs exist for insurers because money not spent on care could go toward marketing, financing, or profits. These pursuits may earn a greater return on investment than simply facilitating care. The controversy surrounding provisions in the ACA for a minimum medical loss ratio (expenses for medical care and quality improvement divided by total premium revenue) of 80% to 85% suggests that insurers are aware of these opportunity costs.<sup>48</sup>

A government report estimates that private insurer administrative expenses range from 7% to 30% of total expenses; of this, 16% represent medical activities like claims processing and 85% non-medical administrative activities like marketing.<sup>49</sup> Corresponding figures for government insurance plans are lacking except for 1 non-peer reviewed publication by an association of private insurers suggesting that administrative costs represented 5.2% of Medicare's expenses in 2003.<sup>50</sup>

The IVE provides a framework for discussing insurers' perspectives on value. It suggests that there may be fewer benefits to the insurer than to the patient for low-acuity visits, especially in high-cost settings.

■ **Table 3.** Characteristics and Resources of Care Settings

	<b>Emergency Department</b>	<b>Longitudinal Office Practice</b>	<b>Urgent Care Clinic</b>	<b>Retail Clinic</b>
<b>Hours of operation</b>	Open 24/7	Generally limited to normal business hours	Open extended hours	Open extended hours
<b>Location</b>	Generally in hospital	Generally in office space	Variable	In retail setting, along with other goods (groceries, etc)
<b>Appointment</b>	None required	Usually required	None required	None required
<b>Same-day access</b>	Yes	Limited or none	Yes	Yes
<b>Common sources for referral</b>	Self, family/friend, MD/NP in other setting	Self, family/friend, MD/NP in other setting	Self, family/friend	Self, family/friend
<b>Predominant type of care</b>	Episodic care	Continuity of care	Episodic care	Episodic care
<b>Immediate capabilities</b>	Extensive laboratories, imaging, and diagnostic equipment	Minimal laboratories, imaging, and other diagnostic equipment	Basic laboratories, imaging, and other diagnostic equipment	Minimal laboratories, imaging, and other diagnostic equipment
<b>Medications</b>	Numerous, including intravenous	Few administered on-site, usually by prescription	Limited, including some intravenous	Few administered on-site, usually by prescription
<b>On-site consulting specialists</b>	Yes	No	No	No
<b>Hospital admission</b>	Immediate, on-site access	May direct admit, but requires transfer	Requires transfer to ED for evaluation	Requires transfer to ED for evaluation
<b>Effect of insurance</b>	Minimal due to EMTALA	May limit access	May limit access	May limit access
<b>Type of provider</b>	MD, NP, and PA	MD, NP, and PA	MD, NP, and PA	Generally NP

ED indicates emergency department; EMTALA, Emergency Medical Treatment and Active Labor Act; MD, medical doctor; NP, nurse practitioner; PA, physician assistant.

**Society Value**

As healthcare accounts for a growing portion of the US economy, it is important to examine value from society’s perspective.

**Output: Productivity.** The Society Value Equation (SVE) posits that healthcare benefits society by improving productivity. Illness creates missed work days, unemployment, and possibly indirect effects such as poverty or crime. Low-acuity conditions may have minimal long-term effects on health but may directly affect productivity because of the large number of people they affect. The wait for scheduled care may slow access to definitive care, resulting in more missed work and a lower value for care in such settings. Additionally, the ED creates value through care for those with limited access, as well as surge capacity in large-scale epidemics or disasters.

**Output: Citizen satisfaction.** The SVE suggests that society benefits from citizen satisfaction since society depends on a social contract among citizens. Depending on a society’s perspective of healthcare as a right versus a privilege, citizens develop expectations of their system and this impacts their satisfaction. As a result, patient gains from healthcare play an integral role in the value.

**Input: Aggregate expenditures.** Society’s costs include total healthcare expenditures (individual expenditures and taxes devoted to healthcare) minus the wealth the industry creates through jobs and profits. In 2009, total ED services represented \$51 billion in expenditures.<sup>23</sup> Data for low-acuity visits are not available.

Some studies suggest EDs can treat low-acuity patients with minimal marginal cost (cost of seeing each additional patient). Applying cost-to-charge ratios to ED charges showed that fixed costs for facility and physician represented the majority of non-urgent visit costs and suggested potential economies of scale (ie, higher volumes lead to a lower per patient cost).<sup>51</sup> The average marginal cost for non-urgent visits was \$24, versus \$67 for semi-urgent and \$148 for urgent.<sup>52</sup>

Another study contradicted these results. It compared annual costs with ED volumes of discharged patients across several hospitals and found that average costs were not lower at higher volumes as one might expect. Hospital accounting data showed fixed costs (ie, capital) accounted for a smaller portion of total costs than variable costs (ie, labor). It found average marginal cost for discharged ED visits of \$295 to \$412.<sup>53</sup>

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These studies are imperfect due to methodological limitations. They use imprecise measures like cost-to-charge ratios and self-reported hospital accounting data.<sup>54,55</sup> The latter study inaccurately defines all discharged visits as non-urgent, and does not include costs for physician services.<sup>56,57</sup>

The effect of marginal costs on society may be muted for the following reasons. For one, low marginal cost is only possible with excess capacity, and many would argue that EDs have limited capacity. Additionally, they are only relevant to society if providers transfer savings to patients and insurers, resulting in lower expenses. Providers may not have incentive to do so, as it could reduce profits and because they may employ cost-shifting to offset poorly reimbursed care.

**Input: Opportunity cost.** Opportunity cost to society equals the value healthcare expenditures could create if dedicated to other purposes, for example, education. Low-acuity ED visits may cost \$4 to \$26 billion annually, representing anywhere from 0.16% to 1.0% of US healthcare expenditures and 0.03% to 0.18% of overall GDP.<sup>1,14-18</sup> The estimated range is wide, and the effect of care site is unknown. However, these figures offer a starting point to measure the impact on the US economy.

### Alignment of Value

Aligning stakeholders' values is necessary to effect meaningful change in care-seeking behavior, but numerous barriers exist. Patients lack incentive to consume care in a manner beneficial to society or their insurer. They may be influenced by social values of individualism and instant gratification.

Insurers and providers face different barriers. Insurers often depend on physicians for the selection of services provided, but physicians may be influenced by constrained resources, fear of legal repercussion, desire for profits, and fatigue in decision making. They may also resist changes to a historically paternalistic healthcare system.

Lastly, society, consisting of individuals with diverging interests, perspectives, and influence, has a difficult time actualizing value and depends on policy makers for whom healthcare is but 1 of many competing interests.

If stakeholders truly seek change in low-acuity encounters, it will be necessary to find some common ground in order to gain widespread acceptance. Insurers hoping to expand their business must consider patient drivers to structure plans that align patient value with their own through use of patient and provider incentives, copayments, and deductibles. For example, if patients value the convenience of after-hours care, an effective copayment must impose a cost higher than that value. Similarly, payment reforms like value-based purchasing should align provider and insurer value to influence providers. Organizations that begin by looking inward to their own strengths for sources to then take outward and create value

may find themselves at a strategic advantage in a competitive marketplace.

Policy makers seeking to maximize healthcare's value in society must consider perspective when creating policy. Aligning value could encourage patients to pursue care and insurers to supply care in a manner beneficial to society at large. For example, if preventive care creates value for society, it could provide incentives to patients and insurers who may otherwise discount long-term benefits over short-term costs. Helping reduce up-front costs by offsetting costs through public funds or by creating options for after-hours access could influence insurers and patients.

Although individual stakeholders may naturally focus on their own value, understanding value from other perspectives allows sharing costs and benefits with other stakeholders to create change. Ultimately, modifying the system to create net-positive value for each group could create buy-in across stakeholders and increase the likelihood of sustainable improvements.

### Limitations

The concepts proposed here have several limitations. The models include variables for which there is not yet publically accessible data. As such, the models represent a framework for discussion, not equations to calculate. Research on tangible and intangible outcomes as well as direct and indirect costs associated with acute, unscheduled care will add to this model in time. It will be vital to consider how, if at all, qualitative aspects can be measured in the application and validation of this model. Additionally, we limited our scope to 3 primary stakeholders; other relevant perspectives include family members, providers, employers, hospitals, and pharmaceutical/device companies. As this dialogue evolves, future examinations should address other stakeholders. Finally, we limited our scope by not addressing the option of "no care," which is also worth future consideration.

## CONCLUSIONS

Determining value from patient, payer, and society perspectives is vital to improving the delivery of acute, unscheduled care. Yet, the quantitative and qualitative elements make comparisons challenging. Heskett's customer value equation provides a framework to approach this discussion, and we present an application to low-acuity visits. This approach highlights areas where stakeholders can align incentives and improve care delivery.

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## REFERENCES

- Centers for Medicaid & Medicare Services (CMS).** National Health Expenditure Tables. <https://www.cms.gov/NationalHealthExpendData/downloads/tables.pdf>. Published 2011. Accessed May 24, 2011.
- Institute of Medicine (US) Roundtable on Evidence-Based Medicine.** The Healthcare Imperative: Lowering Costs and Improving Outcomes, Workshop Series Summary. Young PL, Saunders RS, Olsen LA, eds. Washington, DC: National Academies Press; 2010.
- Hawwood T.** The cost of confusion: healthcare reform and value-based purchasing. *Healthc Financ Manage*. 2010;64(10):44-48.
- Porter ME.** What is value in healthcare? *N Engl J Med*. 2010;363(23):2477-2481.
- AQA Cost of Care Workgroup.** AQA Principles of "efficiency measures." <http://www.aqaalliance.org/files/PrinciplesofEfficiencyMeasurement.pdf>. Revised June 2009. Accessed May 20, 2011.
- Physician Consortium for Performance Improvement (PCPI) Work Group on Efficiency and Cost of Care.** A Framework for Measuring Healthcare Efficiency and Value. [http://www.ama-assn.org/ama1/pub/upload/mm/370/framework\\_meas\\_efficiency.pdf](http://www.ama-assn.org/ama1/pub/upload/mm/370/framework_meas_efficiency.pdf). Published 2011. Accessed May 20, 2011.
- Smith PC.** Measuring value for money in healthcare: concepts and tools. London, UK: The Health Foundation; 2009.
- Pitts SR, Carrier ER, Rich EC, et al.** Where Americans get acute care: increasingly, it's not at their doctor's office. *Health Affairs*. 2010;29(9):1620-1692.
- Ballard DW, Price M, Fung V, et al.** Validation of an algorithm for categorizing the severity of hospital emergency department visits. *Med Care*. 2010;48(1):58-63.
- Weinick RM, Burns RM, Mehrotra A.** Many emergency department visits could be managed at urgent care centers and retail clinics. *Health Affairs*. 2010;29(9):1630-1636.
- Washington DL, Stevens CD, Shekelle PG, et al.** Next-day care for emergency department users with nonacute conditions: a randomized, controlled trial. *Ann Intern Med*. 2002;137(9):707-714.
- Derlet RW, Kinser D, Ray L, et al.** Prospective identification and triage of nonemergency patients out of an emergency department: a 5-year study. *Ann Emerg Med*. 1995;25(2):215-223.
- Kalidindi S, Mahajan P, Thomas R, Sethuraman U.** Parental perception of urgency of illness. *Pediatr Emerg Care*. 2010;26(8):549-553.
- Caterino JM, Holliman CJ, Kunselman AR.** Underestimation of case severity by emergency department patients: implications for managed care. *Am J Emerg Med*. 2000;18(3):254-257.
- Huang CJ, Poirier CP, Cantwell JR, Ermis PR, Isaacman DJ.** Prudent layperson definition of an emergent pediatric medical condition. *Clin Pediatr*. 2006;45(2):149-155.
- Langdorf MI, Bearie BJ, Kazzi AA, Blasko B, Kohl A.** Patients' vs physicians' assessments of emergencies: the prudent layperson standard. *Cal J Emerg Med*. 2003;4(4):75-81.
- Moll HA.** Challenges in the validation of triage systems at emergency departments. *J Clin Epidemiol*. 2010;63(4):384-388.
- National Hospital Ambulatory Care Survey: Factsheet, Emergency Department.** [http://www.cdc.gov/nchs/data/ahcd/NHAMCS\\_Factsheet\\_ED\\_2009.pdf](http://www.cdc.gov/nchs/data/ahcd/NHAMCS_Factsheet_ED_2009.pdf). Accessed June 10, 2012.
- Lowe RA, Bindman AB.** Judging who needs emergency department care: a prerequisite for policy-making. *Am J Emerg Med*. 1997;15(2):133-136.
- O'Brien GM, Shapiro MJ, Woolard RW, et al.** Inappropriate emergency department use: a comparison of three methodologies for identification. *Acad Emerg Med*. 1996;3(3):252-257.
- Cunningham PJ, Clancy CM, Cohen JW, et al.** The use of hospital emergency departments for nonurgent health problems: a national perspective. *Med Care Res Rev*. 1995;52(4):453-474.
- Sharma V, Simon SD, Bakewell JM, et al.** Factors influencing infant visits to emergency departments. *Pediatrics*. 2000;106(5):1031-1039.
- Agency for Healthcare Research and Quality.** Emergency Room Services-Mean and Median Expenses per Person with Expense and Distribution of Expenses by Source of Payment: U.S., 2009: Medical Expenditure Panel Survey Household Component Data. <http://tinyurl.com/7mwurz6>. Accessed June 10, 2012.
- Hesket JL, Sasser WE, Schlesinger LA.** *The Value Profit Chain*. New York, NY: The Free Press, a division of Simon and Schuster; 2003.
- Hesket JL, Jones TO, Loveman GW, Sasser WE, Schlesinger LA.** Putting the service-profit chain to work. *Harvard Business Review*. <http://hbr.org/2008/07/putting-the-service-profit-chain-to-work/ar/2>. Published July 2008. Accessed May 29, 2012.
- Parasuraman A, Zeithaml VA, Berry LL.** SERVQUAL: A multiple-item scale for measuring consumer perceptions of service quality. *J Retailing*. 1988;64(1):12-40.
- Carman KL, Maurer M, Yegian JM, et al.** Evidence that consumers are skeptical about evidence-based healthcare. *Health Aff (Millwood)*. 2010;29(7):1400-1406.
- Baumann BM, Chen EH, Mills AM, et al.** Patient perceptions of computed tomographic imaging and their understanding of radiation risk and exposure. *Ann Emerg Med*. 2011;58:1-7.
- Grote KD, Newman JRS, Sutaria SS.** A better hospital experience. *The McKinsey Quarterly*. 2007.
- Goldman D, Romley J.** Hospitals as hotels: the role of patient amenities in hospital demand. Cambridge, MA: National Bureau of Economic Research. [http://www.bcf.usc.edu/~romley/Hospitals\\_As\\_Hotels\\_current.pdf](http://www.bcf.usc.edu/~romley/Hospitals_As_Hotels_current.pdf). Published April 19, 2010. Accessed May 26, 2011.
- Kozioł-McLain J, Price DW, Weiss B, Wuinn AA, Hongiman B.** Seeking care for nonurgent medical conditions in the ED: through the eyes of the patient. *J Emerg Nurs*. 2000;26(6):554-563.
- Northington WE, Brice JH, Zou B.** Use of an emergency department by nonurgent patients. *Am J Emerg Med*. 2005;23(2):131-137.
- Ahmed A, Fincham JE.** Physician office vs. retail clinic: patient preferences in care seeking for minor illnesses. *Ann Fam Med*. 2010;8(2):117-123.
- Pollack CE, Armstrong K.** The geographic accessibility of retail clinics for underserved populations. *Arch Intern Med*. 2009;169(10):945-949.
- Tang N, Stein J, Hsia RY, Maselli JH, Gonzales R.** Trends and characteristics of US emergency department visits, 1997-2007. *JAMA*. 2010;304(6):664-670.
- Cunningham PJ.** What accounts for differences in the use of hospital emergency departments across US communities? *Health Aff (Millwood)*. 2006;25(5):w324-w336.
- Weber EJ, Showstack JA, Hunt KA, et al.** Are the uninsured responsible for the increase in emergency department visits in the U.S.? *Ann Emerg Med*. 2008;52(2):108-115.
- Long SK.** Emergency department visits in Massachusetts: who uses emergency care and why? Massachusetts Health Reform Survey, Policy Brief. Urban Institute. <http://www.rwjf.org/files/research/48929.pdf>. Published September 2009. Accessed November 15, 2009.
- Selby JV, Fireman BH, Swain BE.** Effect of a copayment on use of the emergency department in a health maintenance organization. *N Engl J Med*. 1996;334(10):635-641.
- Magid DJ, Koepsell TK, Every NR, et al.** Absence of association between insurance copayments and delays in seeking emergency care among patients with myocardial infarction. *N Engl J Med*. 1997;336(24):1722-1729.
- Hsu J, Price M, Ray GT.** Cost-sharing for emergency care and unfavorable clinical events: findings from the safety and financial ramifications of ED copayments study. *Health Serv Res*. 2006;41(5):1801-1820.
- Reed M, Fung V, Brand R, et al.** Care-seeking behavior in response to emergency department copayments. *Med Care*. 2005;43(8):810-816.

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- 43. Mortensen K.** Copayments did not reduce medicaid enrollees' nonemergency use of emergency departments. *Health Aff (Millwood)*. 2010;29(9):1643-1650.
- 44. Mehrotra A, Wang MC, Lave JR, Adams JL, McGlynn EA.** Retail clinics, primary care physicians, and emergency departments: a comparison of patients' visits. *Health Aff (Millwood)*. 2008;27(5):1272-1282.
- 45. Mehrotra A, Liu H, Adams JL, et al.** Comparing costs and quality of care at retail clinics with that of other medical settings for 3 common illnesses. *Ann Intern Med*. 2009;151(1):321-328.
- 46. Machlin, SR.** Expenses for a hospital emergency room visit, 2003. Statistical Brief #111. Agency for Healthcare Research and Quality, Rockville, MD. [http://meps.ahrq.gov/mepsweb/data\\_files/publications/st111/stat111.shtml](http://meps.ahrq.gov/mepsweb/data_files/publications/st111/stat111.shtml). Published January 2006. Accessed November 17, 2010.
- 47. Thygeson M, Van Vorst KA, Maciosek MV, Solberg L.** Use and costs of care in retail clinics versus traditional care-sites. *Health Aff (Millwood)*. 2008;27(5):1283-1292.
- 48. Jost TS.** Writing new rules for insurers—progress on the medical loss ratio. *N Engl J Med*. 2010;363(20):1883-1885.
- 49. Congressional Budget Office.** Chapter 3: factors affecting insurance premiums: key issues in analyzing major health insurance proposals. <http://www.cbo.gov/ftpdocs/99xx/doc9924/Chapter3.7.1.shtml>. Published December 2008. Accessed July 23, 2011.
- 50. Litow M.** Medicare versus private health insurance: the cost of administration. [http://www.cahi.org/cahi\\_contents/resources/pdf/CAHI-MedicareTechnicalPaper.pdf](http://www.cahi.org/cahi_contents/resources/pdf/CAHI-MedicareTechnicalPaper.pdf). Published 2006. Accessed July 23, 2011.
- 51. Williams RM.** Distribution of emergency department costs. *Ann Emerg Med*. 1996;28:671-676.
- 52. Williams RM.** The cost of visits to emergency departments. *N Eng J Med*. 1996;334(10):642-646.
- 53. Bamezai A, Melnick G, Nawathe A.** The cost of an emergency department visit and its relationship to emergency department volume. *Ann Emerg Med*. 2005;45(5):283-290.
- 54. Florence CS.** Nonurgent care in the emergency department: can we save by shifting the site of care? *Ann Emerg Med*. 2005;45(5):495-496.
- 55. Showstack J.** The costs of providing nonurgent care in emergency departments. *Ann Emerg Med*. 2005;45(5):493-494.
- 56. Kellermann AL.** Calculating the cost of emergency care. *Ann Emerg Med*. 2005;45(5):491-492.
- 57. Bamezai A, Melnick G, Nawathe A.** The costs of visits to emergency departments revisited. *Ann Emerg Med*. 2005;46(5):471-472; author reply 472-473. ■