Adoption of Patient Tracking Systems among Hospital Emergency Rooms in California

California HealthCare Foundation

ISSUE BRIEF

Introduction

With the burgeoning of health care technology, more and more systems throughout hospitals are becoming automated, including those in the emergency department (ED). The desire to streamline care systems in the ED is being driven in no small part by patient demand. Nationwide, an estimated 41 percent of all hospital admissions originate from the ED, and 48 percent of hospitals report that their ED is overcrowded, operating either at or over capacity.[1,2]

The California HealthCare Foundation retained The Abaris Group to conduct a survey of California hospitals and their emergency departments to understand to what extent they are using ED information systems (EDIS), also known as ED tracking systems. The research focused on determining which features are being used by EDs and what barriers hospitals encounter in either acquiring or using these systems. Additionally, Abaris looked for positive outcomes and best practices from the adoption of an EDIS.

The survey found that most hospitals have an EDIS and are taking advantage of many features of the technology; however they are doing so with varying levels of satisfaction and success.

This issue brief examines the survey results and provides a side-by-side comparison of some of the most common EDIS and hospital tracking systems.

Background

Many hospitals are transitioning to electronic medical records (EMRs) as well as EDIS. Most of these systems are comprehensive enough to include everything from the EMR, patient tracking, and computerized provider order entry (CPOE) to computerized discharge orders and instructions and billable charges. Others are "home-grown" by the hospitals' own information technology (IT) staff and simply used for patient tracking.

The patient-tracking component of an EDIS essentially time-stamps patient movement through the system. For example, it might capture the time of arrival to the ED, the time the patient is triaged, the time he or she is placed in an ED treatment station, the time when seen by provider, and the time a disposition decision is made—all the way to the final disposition. Additionally, the systems generally track other variables, such as laboratory and radiology orders, from the time of order entry to the time results are ready. Many systems also allow complete nursing and physician documentation, patient order entry, and business features from start to finish, including registration and the record of billable charges as a result of the clinician documentation.

The need to move these systems to an electronic format is hardly controversial. The literature overwhelmingly supports the benefits of doing so; however, many of the systems are prohibitively expensive and the personnel resources needed to implement them can be overwhelming, especially for smaller organizations. Additionally, there is often a resistance to the change from paper to electronic systems, as it can disrupt workflow in the busy ED environment.

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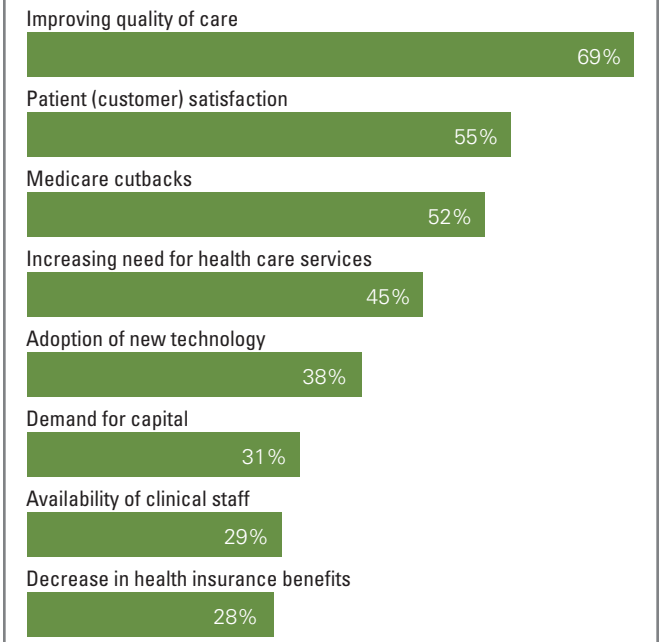
Nationally, the demand for ED treatment has increased the need to further streamline care systems. In 2005, there were approximately 115 million patient visits to EDs in the United States, or about 39.6 visits per 100 U.S. residents. From 1995 to 2005, the number of visits increased from 96.5 million to 115.3 million (up 19.5 percent), an average increase of nearly two million visits each year. During the same period there was a decrease in the number of hospital EDs from 4,176 to 3,795, meaning a total increase in visits per ED from 23,119 in 1995 to 30,388 in 2005.

In California, there were approximately 10.1 million ED visits in 2006, or 27.1 visits per 100 residents. ED visits increased 14.6 percent from about 8.8 million to 10.1 million during the ten-year period from 1997 to 2006, or about 1.4 percent annually. During the same time period, the number of hospital EDs decreased from 395 to 339; however, the inventory of treatment stations within the remaining EDs actually increased from 4,900 to 6,063. This data supports the findings of a 2003 issue brief published by the California HealthCare Foundation which found that ED capacity has been increasing in recent years, despite the fact that there have been a number of hospital closings in the state.[3] While visits per ED increased from 22,274 to 29,732, visits per treatment station actually decreased from 1,796 to 1,662.[4]

With this growing demand, hospitals and their EDs are pursuing numerous measures, including automation, to address the crowding dilemma by accelerating patient flow and improving throughput. This is not always a simple undertaking. In fact, a recent survey of over 400 rural hospital EDs showed they continue to use paper-based medical records.[5] Funding is commonly cited as a barrier, along with uncertainty about which vendor to choose and a lack of the personnel resources necessary for implementing complex systems and ensuring that they are compatible with existing systems. Nonetheless, adoption of new technology continues to be a major concern among hospital leaders across the country as demonstrated by a survey conducted by the Healthcare Information and Management Systems Society (HIMSS).[6]

Figure 1 shows the leading concerns expressed by some 750 U.S. hospitals and health care organizations who participated in the 2007 Annual HIMSS Leadership Survey. The survey gathers information and opinions regarding the use of IT to improve health care from IT executives and various health care providers across the nation. The survey asks about IT priorities, adoption of technology, application usage, and other issues relating to the use of IT in health care.

Figure 1. Top Health Care Business Concerns



Source: Annual HIMSS Leadership Survey, 2007.

Methodology

The Abaris Group obtained a list of all hospitals in California licensed for comprehensive, basic, or standby emergency medical services from the Office of Statewide Health Planning and Development's (OSHPD) Web site. The initial list contained 343 hospitals, of which five that did not have an ED were later eliminated.

The Abaris Group contacted each of the hospitals and asked the ED manager to participate in a brief survey for the California HealthCare Foundation. A general description of the study was provided and survey participants were asked a series of questions from a scripted survey. In several instances, the ED manager referred the call to someone else in the department who was more knowledgeable about the EDIS selection process and the expectations for the system. Given the frequent turnover in ED management positions, every attempt was made to interview those people who were present when the EDIS was implemented and to focus the research on actual users of the systems (e.g. ED managers) rather than IT personnel.

In the end, 47 telephone and four email surveys were completed, for a total of 51. Two surveys were not complete, although any responses provided for individual questions were included in the report.

The survey sample is generally representative of California hospitals in terms of the number of annual ED visits, admissions, treatment stations, and visits per treatment station, with no significant differences observed in any of these areas. This report highlights the pertinent findings from the study.

Vendor Comparison

Nine of the most well-known EDIS vendors were chosen to develop a side-by-side comparison for the purposes of this study. Of the nine vendors, only Medhost and Wellsoft are stand-alone EDIS products; Picis offers EDIS, intensive care unit and operating room products. The remaining vendors offer both EDIS and full hospital-wide patient-tracking and IT systems. StatCom is primarily a patient-tracking system and does not consider itself a "clinical" product for documentation and other features.

While the comparison initially indicated that these products generally offer similar features, anecdotal information from survey participants and other hospitals demonstrated otherwise. The product points described in the marketing materials were not always seen by hospital staff as being easily integrated with existing hospital systems. What's more, hospitals usually have the option of purchasing only a portion of the products, and those that do may not understand that full functionality typically requires a comprehensive system.

Some of the vendors also offer other options such as risk-management features, radiology image viewing, patient photo identification capture, and physician scheduling.

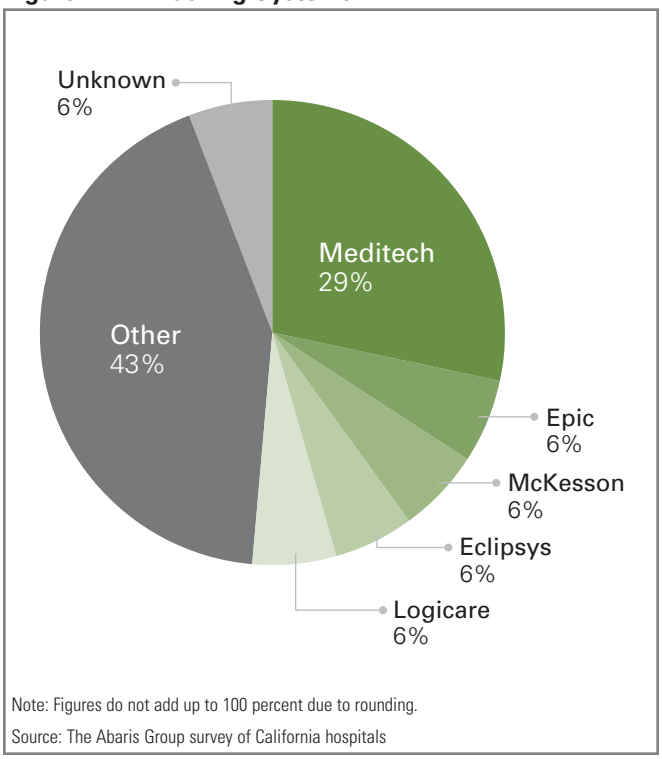
Survey Results

The survey responses by question are as follows:

If you have an ED tracking system, which system do you have?

Thirty-five (69 percent) of the hospitals interviewed have an EDIS. Figure 2 lists which they use.

Figure 2. ED Tracking Systems



Note: Figures do not add up to 100 percent due to rounding.

Source: The Abaris Group survey of California hospitals

Table 1. Vendor Comparison

	PATIENT TRACKING	RN/MD DOCUMENTATION	CHARGE CAPTURE	ANCILLARY ORDERS TRACKING	RX WRITING	CPOE	REGISTRATION/ TRIAGE
Cerner	✔	✔	✔	✔	✔	✔	✔
Medhost	✔	✔	✔	✔	✔	✔	✔
Wellsoft	✔	✔	✔	✔	✔	✔	✔
Meditech	✔	✔	✔	✔	✔	✔	✔
Picis	✔	✔	✔	✔	✔	✔	✔
McKesson	✔	✔	✔	✔	✔	✔	✔
Eclipsys	✔	✔	✔	✔	✔	✔	✔
Statcom	✔			✔			✔
Epic	✔	✔	✔	✔	✔	✔	✔

Note: ✔ Indicates system has the feature.

Source: The Abaris Group

Table 1 shows the standard products offered by these vendors in their most recent versions.

The most common ED tracking system is Meditech, which is used by 29 percent of respondents. Another 6 percent each use Epic, McKesson, Logicare, and Eclipsys. Only two respondents (6 percent) reported that they did not know the name of the system which they are using. "Other" responses include one hospital each using Cerner Firstnet, CPSI, Dairyland, EDIM, EmStat, Health Connect, Ibex, Healthmatics ED, Last Word, Medhost, MS4, and Wellsoft. Two hospitals are using home-grown systems.

Of the hospitals which have an ED tracking system, 51 percent are linked to the hospital's inpatient tracking system. At 34 percent of the hospitals, the two systems do not share data. The remaining 14 percent did not have an inpatient system.

System Functions

Survey participants were asked whether they use their EDIS for a series of common functions. The most commonly used function is real-time ancillary information, which is used by 84 percent of responding hospitals. The vast majority also reported using their tracking system for both data reporting and patient order entry. Of the hospitals that use the patient order-entry function, most reported that orders are entered by physicians, nurses, and the unit secretary. About 55 percent use their EDIS for capturing billable charges, half of them use the nurse documentation feature, and about 40 percent use the physician documentation function. Some respondents stated that although they are not now using some of the available functions, they plan to implement them soon.

How was the system selection decision made and who was involved in the implementation?

Only 31 percent of respondents said that the ED leaders made an independent decision about which EDIS to purchase; the remaining 69 percent said that the decision was made at a hospital-wide, corporate, or regional level.

At more than half of the hospitals (53 percent) the ED nurse manager was involved with the EDIS development and customization, 47 percent included ED physicians in the development, and 41 percent included both the ED medical director and ED staff nurses. At 22 percent of hospitals, all product development was done at a higher level, and did not involve ED input.

What kinds of implementation challenges did you face?

Respondents were asked what challenges they faced with implementing their EDIS and what they would have done differently to make the process smoother. Most (69 percent) said their implementation could have been better. The top improvements they identified included addressing integration capabilities from the start, more thorough training for staff, more research and testing prior to roll out, and customizing the system for the ED rather than simply adopting technology used by the rest of the hospital. Other responses included having additional nurses on duty during roll out so that patient care was not delayed due to the learning process, having better programming support, improved communication plans, valuing staff opinions more, and having an employee of the hospital serve as the project manager.

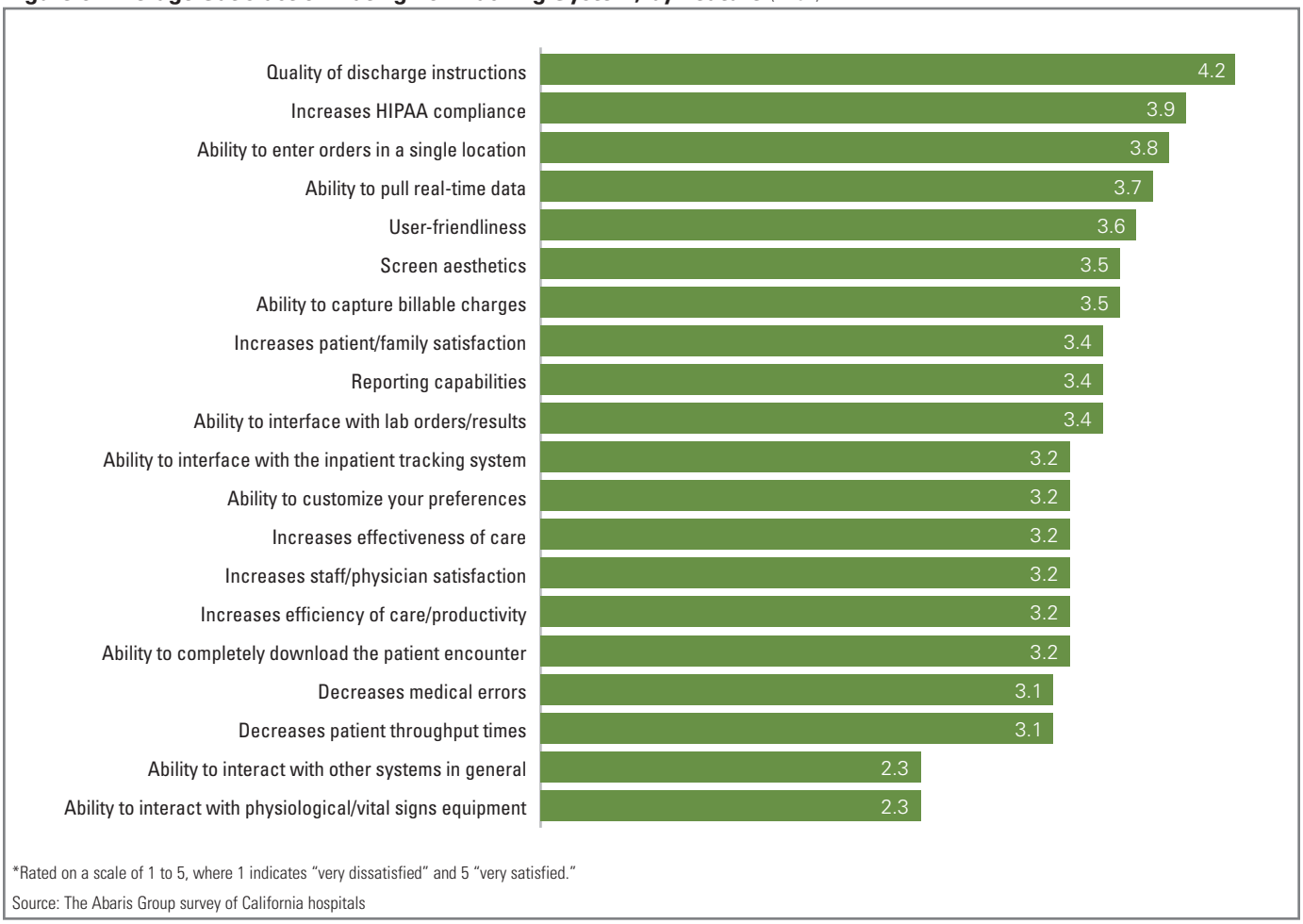
What would you change about the EDIS?

Survey respondents were also asked what they would like to change about their EDIS, if they could change anything. Twenty-six percent of respondents stated that they would not change anything about their system. The most common desired changes were more speed, better ability to track patient throughput times, increased user-friendliness, increased ability to share data with the hospital's inpatient system, and improved reporting capabilities.

What is your satisfaction post implementation?

Survey respondents were asked to rate how satisfied they are with certain features and outcomes of their EDIS on a scale of 1 to 5, where 1 indicated "very dissatisfied" and 5 "very satisfied." On average, participants were

Figure 3. Average Satisfaction Rating* of Tracking System, by Feature (n=32)



*Rated on a scale of 1 to 5, where 1 indicates "very dissatisfied" and 5 "very satisfied."

Source: The Abaris Group survey of California hospitals

most satisfied with the quality of discharge instructions provided by their tracking system (Figure 3). This feature received an average satisfaction score of 4.2, which fell between "satisfied" and "very satisfied." The second and third highest satisfaction scores were increased compliance with the Health Insurance Portability and Accountability Act (HIPAA) and ability to enter orders in a single location, respectively. The systems' ability to interact with other systems in general and ability to communicate with physiological/vital signs equipment in particular received the lowest average satisfaction scores: 2.3 (falling between "dissatisfied" and "moderate").

What three best practices has the EDIS brought to the ED?

Survey respondents were asked what three best practices their EDIS has brought to their ED. The top responses were improved patient tracking, improved patient throughput, and better tracking of laboratory/radiology status and results. "Other" responses included streamlined access to existing EMRs, improved communication among different areas of the ED, improved patient safety, guaranteed documentation in a timely manner, and guaranteed compliance with job expectations. Ten hospitals said that they did not know of any best practices produced by their tracking system because it was too new to evaluate at the time of the survey.

Hospitals with No EDIS

Thirty-one percent of responding hospitals reported that they do not have an electronic patient tracking system in the ED. The top reason given was that such a system would be too expensive and they lacked funding. This response was given by 75 percent of respondents. No hospital said that they did not have an EDIS because they were not convinced that an EDIS would be better than a paper system.

All of the hospitals without an EDIS felt that they could benefit from one, and expected that such a system could lead to a number of improvements related to efficiency, productivity, quality of care, and patient safety. However, some of these expectations differed from the actual outcomes realized by those hospitals which do have computerized patient tracking systems. Specifically, while 67 percent of hospitals with no EDIS believe that it would lead to a decrease in medical errors, none of the hospitals that have an EDIS reported being very satisfied with their system's ability to do so.

Hospital Characteristics

Table 2 shows the breakdown of various hospital characteristics in relationship to ownership of an EDIS.

Table 2. Hospital Characteristics

	HAS TRACKING SYSTEM	NO TRACKING SYSTEM
Part of Health System	69%	31%
Individual Organization	68%	32%
Licensed Beds		
<50	71%	29%
50–99	50%	50%
100–199	69%	31%
200–299	67%	33%
300–399	100%	0%
400+	71%	29%
ED Volume		
<10,000	50%	50%
10,000–19,999	73%	27%
20,000–29,999	56%	44%
30,000–39,999	80%	20%
40,000–49,999	70%	30%
50,000+	88%	13%
ED Treatment Stations		
<10	62%	39%
10–19	63%	37%
20–29	75%	25%
30–39	80%	20%
40+	83%	17%
Inpatient Tracking System		
Yes	91%	9%
No	28%	72%

Source: The Abaris Group survey of California hospitals

The percentage of hospitals that have an ED tracking system is nearly identical among those that are part of a larger health system and those that operate as individual organizations (69 and 68 percent, respectively).

There does not appear to be any correlation between the number of licensed beds a hospital has and whether or not the hospital has an ED tracking system.

Hospitals with the highest annual patient visits to the ED are more likely to have an ED tracking system than those with lower volumes. Only half of hospitals with less than 10,000 annual ED visits have an ED tracking system. The greater the number of ED treatment stations, the more likely it is that the hospital has an EDIS.

The vast majority of hospitals that have an inpatient tracking system also have an ED tracking system. Only 28 percent of hospitals that do not have an inpatient tracking system have an ED tracking system.

Participating Hospitals

Alameda County Medial Center, Highland Campus

Arrowhead Regional Medical Center

Coast Plaza Doctors Hospital

Coastal Communities Hospital (IHHI)

Community Medical Center, Clovis (Community Medical Centers)

Community Memorial Hospital

Corcoran District Hospital

Encino–Tarzana Regional Medical Center, Encino (Tenet)

Enloe Medical Center

Foothill Presbyterian Hospital, Johnson Memorial (Citrus Valley Health Partners)

Garfield Medical Center (AHMC, Inc.)

Hanford Community Medical Center (Adventist)

Hemet Valley Medical Center (Valley Health System)

Hi-Desert Medical Center

Kaiser Foundation Hospital, Hayward (Kaiser)

Kaiser Foundation Hospital, West L.A. (Kaiser)

Kern Medical Center

Lancaster Community Hospital (Universal Health System)

Los Angeles Community Hospital (Alta Healthcare System)

Madera Community Hospital

Mammoth Hospital

Marshall Hospital

Mendocino Coast District Hospital

Mercy Medical Center (Catholic Healthcare West)

Mercy Southwest Hospital (Catholic Healthcare West)

Methodist Hospital of Southern California

Modoc Medical Center

Monterey Park Hospital (AHMC, Inc.)

Northern Inyo Hospital

Oak Valley District Hospital (association of Catholic Healthcare West)

Ojai Valley Community Hospital (Community Memorial)

Peninsula Medical Center (Sutter Health)

Petaluma Valley Hospital (St. Joseph Health System)

Pomona Valley Hospital Medical Center

Presbyterian Intercommunity Hospital

Redlands Community Hospital

Ridgecrest Regional Hospital

Riverside Community Hospital (HCA)

San Joaquin General Hospital

San Leandro Hospital (Sutter Health)

Sharp Chula Vista Medical Center (Sharp Healthcare)

Sonora Regional Medical Center (Adventist)

St. Agnes Medical Center (Trinity)

St. Jude Medical Center (Sisters of St. Joseph of Orange)

Stanford Hospital

Sutter Delta Medical Center (Sutter Health)

Sutter Lakeside Hospital (Sutter Health)

Trinity Hospital

UC Davis Medical Center (University of California)

UCLA Medical Center (UCLA Health System)

Valley Care Medical Center

Summary

This survey showed that the majority of California hospitals are using both inpatient and ED tracking and IT systems, with Meditech being the most popular vendor. About half of the respondents were generally satisfied with the inpatient product, and there were a variety of levels of satisfaction with the EDIS features. Just over half of the hospitals have integrated their inpatient information systems with an EDIS, and the inability to share data with other systems was one of the most common complaints among respondents.

Most of the respondents were satisfied with the user-friendliness of their EDIS, and users reported being most satisfied with discharge orders in the ED. Interestingly, while those respondents who did not have an EDIS believe having one could potentially decrease medical errors, none of those with an EDIS reported being very satisfied that it had done so. Of those who did not have an EDIS, funding was clearly the greatest barrier; at the same time many best practices that could enhance revenue were cited by those with an EDIS. Results included improved patient tracking, improved patient throughput, and improved documentation—all of which can lead to improved recording of billable charges.

One additional conclusion from the survey is that tracking systems could be beneficial not only from a revenue perspective, but also a risk management standpoint. Improved patient safety was cited as a best practice, coupled with the enhanced clinical documentation and options for error reporting. It was evident that to achieve such outcomes, a multi-disciplinary team approach to implementation should be undertaken in order to maximize the results and return on investment from EDIS adoption.

Authors

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Endnotes

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