

EMERGENCY DEPARTMENT OPERATIONS:

A Practical Guide to Management

Ted Matson, MA, FACHE
FreemanWhite Healthcare Consulting



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the outpatient care institute

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A national and international speaker, he has also published several texts: *The Hospital Emergency Department: Returning to Financial Viability* (1986), *Restructuring for Ambulatory Care: A Guide to Reorganization* (1990), *Information Systems for Ambulatory Care* (1990), *The Hospital Emergency Department: A Guide to Operational Excellence* (1992), and *Outpatient Case Management: Strategies for A New Reality* (1994), all published by American Hospital Publishing, Inc., in Chicago.

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Table of Contents

About the Author	iii
Contributors	v
List of Figures	xi
Foreword	xix
Chapter 1 Introduction	21
Chapter 2 Perspectives on Today's Emergency Departments, Past and Present	25
Chapter 3 ED Leadership	43
Chapter 4 Assessing Strategic Options—Hospital-Based and Freestanding	59
Chapter 5 Operational Assessment—ED Metrics	65
Chapter 6 Operational Assessment—System Infrastructure	79
Chapter 7 ED Benchmarks	87
Chapter 8 ED Best Practices	111
Chapter 9 Functional Re-Design Strategies	119
Chapter 10 Programmatic Re-Design Strategies	149
Chapter 11 Physical Re-Design Strategies	157
Chapter 12 Reality-Based Re-Design—Utilizing Simulation-Based Modeling	175
Chapter 13 Determining ED Financial Contribution	185
Chapter 14 ED Financial Management Under APCs	193
Chapter 15 Measuring and Enhancing Staff, Provider, and Patient Satisfaction	209
Chapter 16 Expanding Beyond the Campus ED	251
Chapter 17 The Future	261

Table of Figures

Figure 2.1	Hospital/Emergency Department Utilization, 1980 to 2000	43
Figure 3.1	Sample ED Organizational Chart	45
Figure 5.1	Emergency Department Flowchart of Overall Patient Experience	67
Figure 5.2	Emergency Department Flowchart of Triage—Disposition Experience	67
Figure 5.3	Emergency Flowchart of Admissions Process	68
Figure 5.4	Emergency Department Patient Flow Sequence—All Patients	68
Figure 5.5	Emergency Department Patient Flow Sequence—Discharged Patients	69
Figure 5.6	Emergency Department Patient Flow Sequence—Admitted Patients	69
Figure 5.7	Operational Assessment Data Parameters	70
Figure 5.8	Patient Flow Enhancement Parameters	71
Figure 5.9	Emergency Department Visits by Time of Day	71
Figure 5.10	Category of Service (Triage)	71
Figure 5.11	Emergency Department Visits by Time of Day	71
Figure 5.12	Emergency Department Ancillary Tests	73
Figure 5.13	Age of Emergency Department Patients	73
Figure 5.14	Duration of Emergency Department Visit	73
Figure 5.15	Day of Emergency Department Visits	74
Figure 5.16	Disposition After Emergency Department Visits	74
Figure 5.17	Emergency Department Visits by Time of Day	74
Figure 5.18	Emergency Department Ancillary Tests	75
Figure 5.19	Duration of Emergency Department Visit	75
Figure 5.20	Duration of Emergency Department Visit	75

Table of Figures (continued)

Figure 5.21	Day of Emergency Department Visit	76
Figure 5.22	Age of Emergency Department Visit	76
Figure 5.23	Emergency Department Ancillary Tests	76
Figure 5.24	Day of Emergency Department Visit	77
Figure 5.25	Emergency Department Ancillary Tests	77
Figure 5.26	Emergency Department Ancillary Tests	78
Figure 7.1	ED Length of Stay	88
Figure 7.2	ED Patient Processing Metrics	89
Figure 7.3	ED LOS—All Patients	90
Figure 7.4	ED LOS—Admitted Patients	91
Figure 7.5	ED LOS—Discharged Patients	91
Figure 7.6	ED LOS—Fast Track Patients	92
Figure 7.7	ED Visits/Admissions by Range of Visits	93
Figure 7.8	Average LOS by Range of Visits	93
Figure 7.9	Average LOS by Range of Visits	94
Figure 7.10	ED Visit Acuity by Range of Visits	95
Figure 7.11	ED Admissions by Range of Visits	95
Figure 7.12	Monthly Admission Waits in Hours by Range of Visits	96
Figure 7.13	Monthly Admission Waits in Hours by Range of Visits	96
Figure 7.14	Ancillary Turnaround Times by Range of Visits	97
Figure 7.15	Patients Per Hour by Range of Visits	98
Figure 7.16	Triage Functions by Range of Visits	99

Table of Figures (continued)

Figure 7.17	Triage Functions by Range of Visits	100
Figure 7.18	FTE Staffing by Range of Visits	101
Figure 7.19	FTE Staffing by Range of Visits	101
Figure 7.20	FTE Staffing by Range of Visits	102
Figure 7.21	Existing/Planned Rooms by Range of Visits	103
Figure 7.22	Existing/Planned Rooms by Range of Visits	103
Figure 7.23	Existing/Planned Rooms by Range of Visits	104
Figure 7.24	Existing/Planned Rooms by Range of Visits	105
Figure 7.25	Existing/Planned Rooms by Range of Visits	106
Figure 7.26	Existing/Planned Rooms by Range of Visits	106
Figure 7.27	Existing/Planned Rooms by Range of Visits	107
Figure 7.28	Existing/Planned Ancillary Service by Range of Visits	107
Figure 7.29	Existing/Planned Ancillary Service by Range of Visits	108
Figure 9.1	Assessing ED Admission Process Flow	144
Figure 9.2	ED Admission Process Flow—Goals in Minutes	145
Figure 12.1	Baseline Simulation Model	179
Figure 12.2	Physical Layout Comparison	180
Figure 12.3	Patient Throughput Time	181
Figure 12.4	Estimated Triage Classification	182
Figure 12.5	Patient Throughput Times	182
Figure 12.6	Patient Throughput Times with Increasing Census	182
Figure 12.7	Increased Triage Classification	183

Table of Figures (continued)

Figure 12.8	Estimated Triage Classification	183
Figure 12.9	Patient Throughput Times with Changing Acuity Distribution	183
Figure 12.10	Patient Throughput Times with Increasing Admission Rate	184
Figure 13.1	Sample Volume Worksheet	186
Figure 13.2	Sample Volume and Payor Mix	187
Figure 13.3	Sample Personnel Cost Analysis	189
Figure 13.4	Sample Other Operating Expenses	189
Figure 13.5	Sample ED Performance Pro Forma	190
Figure 14.1	Inpatient/Outpatient Revenue Growth	195
Figure 14.2	Inpatient Documentation/Billing Architecture	198
Figure 14.3	Outpatient Documentation/Billing Architecture	198
Figure 14.4	APC Facility Payment Rates Effective January 1, 2004	199
Figure 14.5	Historical/Current APC Facility Payment Rates	200
Figure 14.6	APC Financial Impact for Sample EDs	201
Figure 14.7	Calculated APC Index for Sample EDs	202
Figure 15.1	Sample of a Completed ED Staff Survey	213
Figure 15.2	Sample of a Completed Medical Staff Survey	222
Figure 15.3	Sample of a Completed Patient Satisfaction Survey	231
Figure 15.4	Blank ED Staff Survey	236
Figure 15.5	Blank ED Medical Staff Survey	240
Figure 15.6	Blank ED Patient Satisfaction Survey	246

Emergency Department Operations: A Practical Guide to Management

Not long ago, the emergency department was known as the "accident room" or "emergency room" or among physicians assigned to obligatory emergency medicine rotations from their preferred specialties as "the pit." Those terms convey a limited view of purpose and capability, suggesting a small, undesirable space where seriously ill and injured patients were evaluated and treated by physicians in training for practices outside emergency medicine. Now outmoded, this concept was an important early step for the specialty practice of emergency medicine and for today's sophisticated emergency care arenas. As the "front doors" of urban, suburban, and rural hospitals, emergency departments are staffed by dedicated specialists with access to sophisticated diagnostic technology and to other medical specialists for consultation. Emergency department teams assess and treat anyone who enters, no matter the condition or complaint.

The orchestration of a multidisciplinary staff tending to multiple patients simultaneously and interacting with a host of support services requires intense coordination among clinical staff and administrators, not only those affiliated with the emergency department but also those directing the parent hospital or medical center. As we gain experience in this new world of emergency medicine, we are realizing that our understanding of the complexities of good emergency department management is only beginning to emerge.

Emergency departments are unlike any other medical entity. They are not private practice offices and they do not fit a simple business model.

Traditional views of hospital financial spreadsheets suggest that emergency departments are money pits...necessary operations that operate at a loss. However, by looking at spreadsheets in a different way, we are beginning to understand that an emergency department can have a central role in the business operations of a health care organization. Because of the diagnostic efficiency of emergency physicians, patients' conditions are identified quickly, allowing appropriate discharge/disposition decisions to be made and implemented. Patients admitted through the emergency department have shorter lengths of stay and consume fewer hospital resources yet have better outcomes from the personal as well as the institutional perspective.

The continued maturation of emergency medicine will benefit from this book by Ted Matson and his associates. A much-needed addition to the health care management

literature, it is an impressive compendium of practical knowledge about the inner workings of an efficient and cost-effective emergency department. ***Emergency Department Operations: A Practical Guide to Management*** presents insights that will help emergency department managers do their jobs better, with an expanded view of internal operations and interdepartmental interactions. This book will also open the eyes of hospital administrators who seek to better understand the complexities of emergency department management and the integral role of the emergency department in a medical institution's public image and financial well-being.

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It has often been said that healthcare is the most complex industry. It is difficult to forecast, almost impossible to stay abreast of (regulations), and even harder to staff-all with the promise of fixed or declining revenues.

Still, our industry is rather dynamic. For nearly two decades, it seemed as though managed care and a declining inpatient population would spell doom for the American hospital. Yet, these trends have reversed course. Continued population growth and an aging population are the drivers of healthcare revenues and profitability, and will be for a long time to come.

If healthcare is the most complex of industries, the emergency department (ED) must certainly be the most challenging operating environment within hospitals. This single department accounts for the highest patient utilization among hospital-wide outpatient services, all of whom are undiagnosed and unscheduled arrivals. The ED is also the single largest referral source of all inpatient admissions with many reflecting markedly higher acuity levels than could have been imagined just several years ago. Today, it is not uncommon to find hospitals that admit up to 70 percent of all inpatient admissions from the ED.

This outpatient/inpatient conflict of diverse patient needs, acuities, resource consumption, and functional space requirements has rendered the typical ED obsolete. This situation is no longer a trend, but a reality-lengthening waiting times for patient processing, management, and admission; ambulance bypass due to ED crowding; and declining levels of patient satisfaction. As the ED positions for a new future of care delivery, redesigning systems will be paramount to achieve high performing operations.

Like all healthcare programs, much has been written about the ED-its focus, challenges, opportunities and imperatives for change. Even with such an expansive body of knowledge, however, hospitals and their EDs continue to struggle to achieve operational excellence. Hundreds of variables literally conflict in each department every day. When these functional impediments reach a critical mass or trigger a specific sequence of events, the entire system breaks down and delays become inordinate. Recovery to full strength status may require days and not just hours.

To this end, this publication was developed to assist hospital executives, physicians, nurses, and other members of the ED team as they strive to enhance the operational performance of their department. It is based on over ten years of direct field experience in assisting hospital EDs with strategy execution and operational redesign efforts. These hospitals range from small, rural institutions to some of the largest integrated health systems in the country.

Many operational guidelines in this book are presented in practical, easy to reference text; thus, it is clearly for the benefit of the ED team as a quick and valuable resource. While straightforward in its presentation of potential solutions, this book is not an authority on legal or even consulting advice, given that all hospitals and their EDs have individual circumstances and must be assessed accordingly. In brief, a synopsis of the book is provided here:

Chapter 1: Introduction

Chapter 2: Perspectives on Today's Emergency Departments, Past and Present

Trends and quantitative research findings on the changes that have occurred in ED utilization over the past two decades, including current issues

Chapter 3: ED Leadership

New organizational structures to enhance ED management

Chapter 4: Assessing Strategic Options-Hospital-Based and Freestanding

Review of major options to enhance ED performance, according to particular options, advantages, and disadvantages

Chapter 5: Operational Assessment-ED Metrics

Review of major utilization and clinical data which are imperative to evaluate current delivery of services for critical decision-making, including specific case examples of individual data elements and provider profiling summaries

Chapter 6: Operational Assessment-System Infrastructure

Step-by-step inventory of major ED components, from initial patient access to discharge

Chapter 7: ED Benchmarks

Review of major benchmark indices for emergency department setting, including their use and application in assessing/determining redesign options

Chapter 8: ED Best Practices

Review of best approaches to ED operations and management, encompassing access to discharge innovations in service delivery

Chapter 9: Functional Re-Design Strategies

Detailed step-by-step examples of operational re-design options for major components of ED workflow and patient flow

Chapter 10: Programmatic Re-Design Strategies

Development and enhancement of various ED programs including chest pain observation, urgent care, express admission units and pediatric emergency departments

Chapter 11: Physical Re-Design Strategies

Actual physical re-design imperatives required for high performing EDs, including parameters for early conceptual programming of ED expansion options

Chapter 12: Reality-Based Re-Design-Utilizing Simulation-Based Modeling

Utilizing sophisticated computer modeling techniques to assess “what if” impacts on operations, programs and facility expansion prior to actual implementation

Chapter 13: Determining ED Financial Contribution

Outlines pro forma approach to measure ED financial contribution, including the impact of downstream revenue impacts from both ED outpatients and inpatients

Chapter 14: Emergency Department Financial Management Under APCs

Comprehensive review of ED visits which are impacted by Medicare's Ambulatory Payment Classifications (APCs), including financial impact scenarios of APCs

Chapter 15: Measuring and Enhancing Staff, Provider and Patient Satisfaction

Determinants of patient, provider and staff satisfaction in the ED setting, including what to measure and how results are utilized to enhance performance

Chapter 16: Expanding Beyond the Campus ED

Determining how and when to expand capacity beyond the campus-based ED

Chapter 17: The Future

Review of major issues that have transformed the ED during past decade, discussion of emerging issues and how likely they will challenge and transform the ED in the future

A final caveat to the reader—all information outlined herein should be utilized as guidelines only and should not be construed as constituting factual basis for development and implementation of actual hospital departmental standards. All EDs differ in their size, service provision, level of staffing, utilization, patient acuities, layout and configuration and finally, the communities they serve.

These tools and resources should be utilized to begin asking questions about ED performance such as options for assessment, comparisons to others in industry, and opportunities for service improvement. In this realm, *Emergency Department Operations: A Practical Guide To Management* has been developed for providers of emergency care in hopes that it will be utilized to enhance the operational excellence of emergency departments nationwide.

Given the dynamic nature of the ED and in recognition of the need to update the publication in future editions, the author encourages questions and comments on any aspect of the information presented.

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Chapter Two: Perspectives on Today's Emergency Departments, Past & Present

Since formal adoption as a defined organizational unit within hospitals in the mid-1960s, the ED has grown in size, complexity, and overall service provision. Today the ED represents the single largest outpatient department in hospitals, and due to its role as the primary site of care for unscheduled inpatient admissions, contributes up to 50 percent of total hospital revenues.¹ Clearly, the ED is a major site of care for hospitals and the communities they serve.

Historical Trends in ED Utilization

Despite an increasing trend in visits and inpatient admissions in EDs over time, two periods in the past three decades have actually resulted in significant declines in ED visits nationally.² The first period of declining visits occurred in the early 1980's when utilization peaked in 1981 and declined for two years, until re-bounding in 1984.³ During this period, two factors were primarily noted as contributing to this trend: namely, the impact associated with the national recession, which occurred in 1981 to 1982; and the emergence of the freestanding urgent care center industry, which started in 1980.⁴

For many hospitals, this latter trend was significant as some institutions experienced a 10 percent reduction in ED visits during this period.⁵ When hospitals reported a net increase in visits at pre-1981 levels in 1984 and thereafter, credit was given to the aggressive re-configuration of EDs which incorporated fast-track urgent care services, reduced pricing, altered staffing patterns, and effective marketing strategies. Since 1984 to only recently, ED visits have increased consistently, averaging two to five percent each year for individual hospitals.⁶

The second period of ED decline occurred in the mid 1990s. This decrease has largely been attributed to the emergence of payor efforts to reduce inappropriate ED utilization, as many studies have indicated 60 to 70 percent of ED visits are of a non-urgent nature and could effectively be treated in alternative settings.⁷ Also, during this same period, a number of State initiatives were created to enroll Medicaid populations in managed care networks to avoid unnecessary and costly ED visits.

In the State of Washington, the first state to mandate Medicaid managed care arrangements, total ED volume after the first year of implementation declined approximately two percent.⁸ Anecdotally, some institutions that did not create ED provider sites for Medicaid managed care witnessed moderate to severe utilization declines—accounting for as much as a 30 to 40 percent decline in ED visits.⁹

A New Decade — And a New Era of Growth

However, beginning in the late 1990s and continuing to the present day, many facilities began to experience varying periods of ED overcrowding and ambulance diversions. In the first government sanctioned study on the causes and effects of growing ED utilization trends, the Centers for Disease Control firmly established that visits per thousand were increasing at a much higher rate. In 1999, the CDC reported 378 annual ED visits per 1,000 population versus the 360 visits per 1,000 noted previously.¹⁰

In a recent study of California ED visits, researchers concluded that most of the ED crowding was due to significant increases in urgent and critically ill cases, which jumped 59 percent and 36 percent respectively.¹¹ Conversely, non-urgent care cases actually declined 8 percent during the same period. Based on a one-month survey in November 2001, the American Hospital Association identified that roughly 62 percent of hospital EDs reported being at or over operating capacity, with a third of hospitals reported being on diversion.¹²

Overall, this growth is significant as strong utilization is occurring in many markets. For instance, in the State of Arizona (the second highest penetrated managed care market in the U.S.) in which over 80 percent of the population is covered by managed care plans, two of the largest healthcare systems experienced a 30 percent increase in ED visits.¹³ Although ED visit growth is a highly watched statistical trend, in today's environment ED visit volumes have less meaning—it is the actual acuity of these visits that define each hospital's struggle to efficiently care for patients.

Perhaps the best measure of the pressures hospitals face now and in the future lies in the performance characteristics of the entire healthcare industry, and the ED's special role within this environment. As shown in Figure 2.1, hospital/emergency department utilization from 1980 to 2000 reveals startling trends:

- ◆ While the U.S. population has increased 24.3 percent from 1980 to 2000, the number of hospitals have decreased 16.5 percent and the number of beds taken out of service have decreased 27.6 percent.
- ◆ In terms of the ED, the number of hospitals reporting an ED declined 8.9 percent at a time when ED visits increased 30.4 percent (1980 to 2000). ED visits per 1,000 population reached 384 visits per 1,000 (2000).
- ◆ The dramatic growth in ED utilization has also occurred in tandem with the generalized shift to outpatient care, which is nothing short of phenomenal during the past two decades. Outpatient visits to hospitals with organized outpatient departments have increased 84.7 percent, approximating 486 million visits in 2000 versus 263 million visits in 1980.

In summary, the U.S. population has experienced far greater growth than the hospital industry's ability to keep pace with demand for services. It should be no surprise that crowding and patient delays plague EDs, given fewer hospitals, fewer beds, and a rise in visits and admissions. Even growth in general outpatient services has greatly impacted the ED, in that ED patients must compete for the same ancillary services on a daily basis. From

this assessment alone, it is clear that hospitals have no other choice than to effect significant and systemic change if they are to keep pace at all.

Emerging Issues and Their Impact on Service Delivery

In recent years, a number of issues have also emerged that drive the provision of emergency department services. These issues encompass federal mandates and new service developments.

Federal Mandates

In 1986, the Emergency Medical Treatment and Labor Act (EMTALA) was enacted to minimize patient dumping among both transferring and receiving Medicare participating hospitals.¹⁴ A number of procedural requirements were detailed in this legislation. However, the most significant was the mandate for hospitals to perform a medical screening examination on all patients, regardless of the patient's ability to pay.

While envisioned to merely embrace quality patient care already performed in EDs, EMTALA effectively required hospitals to re-configure their methods of patient triage; because patients' financial information could not be requested until formalized triage occurred, more extensive triage processes were needed and had to be performed prior to patient registration. Hospitals have struggled with implementing EMTALA due to the number of issues involved and the liability exposure of both nursing staff and physician providers.

Overall, EMTALA has caused great confusion in the ED and has further complicated the triage processing of all patients, including extensive paperwork, telephonic communication to multiple involved parties, monitoring, and follow-up issues.¹⁵ It has created an increase in the time required to triage the patient, and therefore has been a contributor to extended delays in patient waits and overall turnaround times in the ED. The latest updates on EMTALA can be found at www.cms.hhs.gov/providers/emtala/default.asp.

New Service Developments

The advent of trauma care in the early 1970s illustrated the gains to be achieved in patient care by providing focused care to various ED population segments. This trend has led to a number of clinically specific programs for select ED patient groups. In essence, the ED has become the critical hub for unscheduled services within the hospital setting and is only limited to the needs of the patient population to be served and the resources of each hospital to provide these services. Individual programs and their intended purpose are as follows:

Trauma Care/Level I or II Categorization

Purpose: a multidiscipline approach to seriously injured patients arriving by air or ground transport; integrates pre-hospital, hospital, and post-hospital resources for optimal outcomes

Benefits: community service with highly intangible benefits; high dollar cost,

especially for urban and regional referral centers with high volume; both benefit and cost dependent on severity and mechanism of injury (penetrating vs. blunt)

Non-Urgent Care (Walk-in Treatment)

Purpose: expeditious and cost effective treatment of non-urgent patient types, requiring limited resource utilization or skilled therapeutic intervention

Benefits: enhanced patient convenience and satisfaction, increased market potential and subsequent volumes, and timely and more cost-effective application of care delivery for non-urgent patient types (may not require high cost certified ED physician or registered nursing staff)

Chest Pain Emergency/Evaluation

Purpose I: two component systems to enhance early diagnosis and rapid applications of cardio-protective and interventional therapies with community education and outreach programs promoting recognition and early treatment

Purpose II: permits extended observation with advanced modalities to assist in the differential diagnosis of early ischemic heart disease vs. non-cardiac entities-thus avoids unnecessary admission

Benefits: intangible (lives saved) and cost benefit dependent on individual program management; national estimates of net annual profit of \$780,000 on \$56,000 investment;¹⁶ increased utilization of cardiac evaluative (invasive and non-invasive) services; increased physician referrals; cost savings in critical care/telemetry admission

Observation Unit

Purpose: separate area for diagnostics, extended observation or definitive therapies required by numerous patient types who do not qualify for acute hospital admission nor meet caregiver criteria for safe discharge from the ED or other outpatient areas; normally provides medical-surgical observation but can be adapted for cardiac or other specialized applications

Benefits: patients have quiet oasis for rest and therapy; physicians have an alternative to liability for erroneous discharge; departments and staff can decompress visits or holdovers; hospitals have an alternative to revenue take backs for inappropriate admissions

Pediatric Emergency/Evaluation

Purpose: recognizes increasing demand and special needs, equipment, and treatment modalities for the pediatric population with dedicated program and space; may include immunization program as dictated by need

Benefits: community service with strong market potential/benefit from economies of scale; majority non-urgent visits, urgent often treatable with short

term observation/hydration; potential for contract or negotiated emergency and primary after-hours care with local pediatricians and managed care providers

Geriatric Emergency/Evaluation

Purpose: recognizes the special needs of the elderly with philosophies of care and other applications such as safety, physical design, lighting, equipment, and case management/discharge planning; highlights functional assessment and appropriate referrals for elderly patients and their families or caregivers

Benefits: cost savings in unnecessary or inappropriate admissions with focused case management programs

Psychiatric Emergency

Purpose: segregates clients with behavioral disorders and allows focused intervention by specially trained staff

Benefits: provides focused episodic treatment or outpatient therapy for continued inpatient to outpatient shifts; added safety for other patients, staff, and visitors

Women's Health

Purpose: provides specific consideration and focused care philosophy to a population with special health care needs, such as dedicated rooms, services, and staff for OB/GYN patients presenting to the ED

Benefits: hospital and physicians with increased marketshare; based on realization of women as primary decision makers regarding family health care

Occupational Health

Purpose: provides acute and routine management of employee health, illness, and injury; may include drug screening, pre-employment physicals, and other comprehensive assistance programs

Benefits: opportunity for both hospital and physicians with low cost/high benefit ratio; community/employer benefit; improved marketshare; increased resource utilization and physician referrals; direct contract negotiation

Sports Medicine/Orthopedics

Purpose: provides timely and comprehensive care to patients with musculoskeletal injury

Benefits: low cost/high benefit rationale with increased hospital revenues, physician referrals; low staff consumption; high ancillary resource utilization

HMO/Primary Emergency/Evaluation

Purpose: expeditious after-hours primary and emergency treatment of select managed care patients

Benefits: increased revenues; economies of scale for primarily pediatric and non-urgent patient types with contract negotiation for capitated per encounter payment

Community Outreach Programs

Purpose: maximizes community resources, enhances primary care options/access; provides health-focused resources to identified needs; improves continuity of care; decompresses emergency department; effects behavioral change; promotes community health

Benefits: ED, hospital, and community (patients); encourages community needs assessment; provides care in most appropriate setting; allocates resources more cost effectively

National ED Operational Trends - General Utilization

A closely watched survey by ED providers is the National Hospital Ambulatory Care Medical Survey, first introduced in 1992 by the Centers for Disease Control and Prevention (CDC). A component of this survey, which measures trends in hospital outpatient departments, provides overall utilization metrics and trends in ED utilization. Based on data from 2002, the most recent survey can be found at www.cdc.gov. A number of salient findings from this survey are of particular interest to providers.¹⁷ They include the following:

The ED utilization rate of responding hospitals rose from 357 visits per 1,000 in 1992 to 389 visits per 1,000 in 2002 and was driven primarily by increased use among persons 45 years of age and over.

- ◆ Approximately 22.3 percent of ED visits were classified as emergent, 34.2 percent were urgent and 10.2 percent were non-urgent
- ◆ The duration for two-thirds of ED visits was between 1 and 6 hours
- ◆ Approximately 3.1 percent of patients had been seen within the last 72 hours, and 5.5 percent of all visits were for follow-up of the same problem
- ◆ Diagnostic /screening services and procedures were provided at 86.8 and 43.2 percent of visits, respectively

National ED Operational Trends - Overall Utilization By Bed Size

A true quantitative profile of the unique operational characteristics of hospital EDs by individual bed size groupings has never been reported in the literature until now, except in various case-study reviews. In order to fully understand the ED organizational, functional and operational environment in hospitals as a prelude to embarking on performance improvement initiatives, it is important for providers to understand these differences. The following trends in ED utilization, derived from a 2002 survey which was administered to all U.S. community hospitals in order to quantify ED operational characteristics by bed size, are provided along with discernable trends of the data findings¹⁸. For this trend

analysis hospitals were categorized according to one of several ED visit ranges: hospitals less than 20,000 ED visits; 21,000 to 40,000 ED visits; 41,000 to 60,000 ED visits; and finally, hospitals with 61,000 to 80,000 ED visits.

Operational Trend-ED Visit Utilization

Overall, hospital ED visits continue to increase and significant growth is evidenced in both emergent and non-urgent categories; this trend will result in extended lengths of stay for ED patients, causing additional pressure to decrease treatment/waiting times in the future.

Regarding overall visit information, all EDs during the study period witnessed increased utilization; however, in terms of admissions via ED, only hospitals with less than 20,000 visits witnessed a decline in actual admissions. All other hospitals reported increases in both overall hospital admissions and admissions via the ED, except the smallest volume ED grouping. This group reflected virtually no change in total hospital admissions. This trend perhaps reflects that smaller hospitals are transferring more of their emergent cases to hospitals with a higher level of definitive care; this fact is noted for the smallest ED visit groups—they have witnessed an increase in emergent visits while overall hospital admissions have remained unchanged.

In terms of patient utilization according to levels of acuity, all facilities have witnessed an increase in emergent visits during the study period; urgent care visits have also increased in the two largest hospital groups, however, have declined in the smaller ED groups. Increased acuity for the larger groups, again, may be the direct result of additional referrals or transfers from peripheral institutions in a given service area, while smaller hospitals may be providing more appropriate care as a result of their experience with dedicated fast-track developments. For these institutions, both non-urgent care and fast-track service volumes have increased significantly during the period of study.

Operational Trend-ED Admission Utilization

Hospitals will continually be challenged to accommodate the unique demands associated with ED admissions—not only to expedite care for growing numbers of patients, but also to effect the timely transfer of patients to in-house beds. Observation beds will represent a significant resource for ED admissions in the future.

All hospital EDs reported decreases in actual number of admissions to regular inpatient beds, perhaps mirroring the national trend to decrease inappropriate admissions, except the largest ED group (61,000 to 80,000 ED visits) which reflected increases in admissions for all major categories represented, i.e., regular, critical care, telemetry and observation beds. Among all bed types, observation services have experienced the most significant rates of growth.

Operational Trend-Payor Mix

The payor-mix of ED patients has changed dramatically in recent years; historically, commercial rates for ED setting exceeded 30 percent.¹⁸ All ED groupings responding to the

survey indicated private insurance rates ranging from 22 to 26 percent, while also reflecting managed care rates exceeding 15 percent—except for the largest hospital group (61,000 to 80,000 ED visits), which only reported a six percent managed care rate. This latter utilization trend may be explained due to the high percentages of Medicaid and Self-Pay populations, often indicative of large urban and inner city facilities; these centers have been slow to aggressively contract for managed care patients.

Operational Trend - Triage Function

Hospitals utilize a number of different staffing arrangements for patient triage. Overall, while all have a triage function not all provide this service utilizing dedicated nursing personnel in triage at all times. Lower volume EDs may have a response system to notify staff that patients are waiting to be seen in triage while other EDs of varying visit volumes may utilize paramedic/technician assisted triage to augment formal RN triage. Due to the ever-increasing demands to improve patient care processing, hospitals will need to challenge traditional forms of triage. For instance, in advanced systems, triage is actually being done by physicians at triage or by nursing personnel after the patient is immediately placed in the treatment room following a brief assessment. To be fully effective, this also requires infrastructure modifications in the ED as well as new operating practices, such as beside registration.

It is apparent from survey respondents that dedicated triage staffing is directly proportional to the actual number of ED visits. In the smallest EDs (less than 20,000 visits), only 7 percent of respondents indicated a dedicated triage function with an assigned registered nurse; conversely, the largest EDs (61,000 visits or greater), had 100 percent triage with registered nurses.

A number of EDs have continued to alter the skill mix of traditional triage with paramedic level assistance. Among the highest volume EDs, 80 percent had this additional skill level, while in the smaller sized EDs the level approximated 20 percent. Physician directed triage has also increased, however, is again a function of overall departmental volume. In the highest volume EDs, this service was identified by 20 percent of survey respondents while non-existent in the smaller EDs.

Many EDs have developed patient specific guidelines to expedite diagnostic ordering consistent with presenting complaints of patients. In general, among all ED groupings, over 50 percent have basic protocols in place at triage.

While deemed helpful, a number have also implemented advanced protocols to further enhance patient processing times. These guidelines incorporate additional testing for a broader array of presenting complaints, yet are still not employed by the majority of survey respondents.

Operational Trend-Average Turnaround Time

In view of higher patient acuities, EDs continue to struggle to improve overall turnaround times. While some have greatly enhanced overall processing times, many EDs

have significantly higher waits for patients requiring general medical and telemetry beds.

Among all hospital ED groupings, the average turnaround time for all ED patients is approximately 140 minutes. This time differs dramatically for both outpatient and admitted patients as well as by level of ED visits. Overall, non-urgent patients who do not require ancillary services are treated and released in approximately 70 minutes or one-half the overall rate. However, if ancillary services are provided to this group, turnaround times increase to 108 minutes (an increase of 54 percent).

In terms of admitted patients via the emergency department, overall turnaround times to admission approximate 167 minutes for patients requiring a general medical/telemetry bed, while critical care beds are slightly lower at 154 minutes. Again, the highest turnaround times are a function of the highest ED volumes; hospitals with 61,000 ED visits or greater report 252 minutes for general medical/telemetry beds while critical care beds reflect 207 minutes.

Operational Trend-Ancillary Turnaround Time

The majority of patients presenting to the ED will have some level of ancillary testing due to the unknown nature of his/her clinical presentation as well as primary medical history. Ancillary services continue to represent a significant challenge for hospitals in their efforts to decrease overall processing times. A number of factors contribute to the turnaround equation, and often are not just the performance of the exam and the reporting of results.

Among all survey respondents, turnaround times for the primary array of ancillary tests in the ED (laboratory, EKG, general radiology, and CT scans) were at or less than 60 minutes. Laboratory testing and CT scans each approximated nearly 60 minutes, followed by general radiology exams with 40 minutes and EKG's with 12 minutes.

Interestingly, among all categories of ED groupings, all were consistent with overall average turnaround times except CT scans in the highest volume EDs, which were significantly longer than other ED visit groups. In view of the aforementioned differences in turnaround times among the survey respondents and the relative consistency of ancillary turnaround times, other factors are no doubt impacting total length of stay in the ED.

Operational Trend-System Bottlenecks

A number of parameters impact the timely processing of ED patients, including triage process, room assignment and patient placement, physician/nurse assessments, ancillary services required, medical staff consultation, and inpatient bed availability. These variables impact the ED on nearly every shift of care and are exacerbated during peak periods of census, which, consequently, prolong waiting times throughout the duration of a shift or 24 hour period. Minimizing the variability among all these factors will be required to significantly enhance patient processing times.

Hospital respondents identified a number of factors that frequently cause system bottlenecks in the efficient processing of ED patients. In order of magnitude, the top ten reasons included the following:

- ◆ delays once patient is in treatment area
- ◆ laboratory test ordering and processing
- ◆ medical staff consultation
- ◆ availability of a telemetry admission bed
- ◆ availability of a critical care admission bed
- ◆ timely response by private medical physician
- ◆ registration process
- ◆ expediting patients to treatment area
- ◆ general patient transfer process
- ◆ and radiology transport/room availability

Respondents indicated services that cause bottlenecks as well, such as CT, ultrasound, or nuclear medicine technician availability on an on-call basis; timely delivery of pharmacy medications; and availability of a general admission bed.

Among all hospital ED groupings, these factors were consistently identified as resulting in patient care processing delays. However, the largest ED groups, 41,000 to 60,000 visits and 61,000 visits or greater, identified three additional factors that frequently caused primary ED delays: overall patient entry to triage area/triage process, patient assessments/work-ups by resident physician staff, and lack of critical care admission beds. Clearly, these institutions will have the greatest challenge to significantly improve operational/patient care processing of ED patients due to their overall higher volumes and patient acuties.

Among the factors sighted by respondents, the timely admission and availability of in-house patient beds remains one of the most difficult issues to resolve. Obviously, the inability to effect timely transfer of these patients results in unnecessary back-ups for other patients requiring such beds, not to mention the on-going monitoring required for patients awaiting transfer. As mentioned previously, admitted ED patients have a departmental length of stay approximating 2.5 to 3 hours.

However, respondents indicated varying levels of extended waits experienced for patients requiring an in-house bed. On average, 47 patients per month waited 6 to 8 hours for an inpatient bed, 17 patients waited 8 to 12 hours, and 9 patients waited 12 to 24 hours. These extended waits were most pronounced for hospitals with 41,000 to 60,000 ED visits; on average, over 265 patients per month waited 6 to 8 hours for an inpatient bed, 124 patients waited eight to 12 hours, and 82 patients waited 12 to 24 hours.

Operational Trend-Effective Operational Systems

Hospital emergency departments have identified a number of effective approaches to enhance overall patient care processing. They include, but are not limited to, the following:

adequately designed treatment areas and patient entry; triage processing systems with designated protocols to expedite diagnostic testing; clear designation and accountability of nursing management; and appropriate patient technologies, such as state-of-the-art physiologic monitoring systems. Despite knowledge of what can be effective, hospitals continue to struggle with implementation of these systems.

Among survey respondents, the most frequently cited approaches to increase efficiency of ED operations included the following:

- ◆ appropriately designed and physically separate ambulatory/walk-in patient access; fixed physiologic monitoring capabilities
- ◆ permanently assigned shift positions with a designated charge nurse; utilization of specific protocols at triage to enhance patient throughput; dedicated EKG machines in the ED versus EKG response to the department
- ◆ separate area or fast-track for non-urgent patients; dedicated area for chest pain evaluation and observation services
- ◆ permanently assigned positions for patient advocates and/or patient representatives

These approaches were consistent for all ED visit groupings, except the use of decentralized or bedside patient registration in hospitals with over 40,000 visits.

Operational Trend-Overall Staffing

To improve overall operational performance while also reducing the direct cost of services provided, many EDs have augmented staffing with a wide range of professionals. In addition to physicians, these include nurse practitioners, physician assistants, technicians and paramedics. Further, a number of innovative staffing arrangements have also been established, incorporating most types of personnel but utilized strictly on an on-call basis.

Regardless of annual ED visit volumes, all hospitals report a wide range of staffing patterns including nurse practitioners, physician assistants, and technician trained personnel. However, some interesting staffing ratios are noted. For the smallest EDs (less than 20,000 visits), 2.3 registered nurses per technician are noted while EDs between 21,000 to 40,000 visits reflect a much higher ratio of 3.7 registered nurses per technician.

Conversely, for departments in excess of 40,000 visits, hospitals rely less on technician level personnel. Among EDs encompassing 41,000 to 60,000 visits, the ratio is 3.2 registered nurses per technician versus 2.3 nurses per technician in EDs representing 61,000 visits or greater. This fact may be due to the higher acuity level associated with larger volume EDs and the need for greater complements of registered nurses and/or physician assistants. No other discernible trends are noted except for the additional staff complements in assistant nurse manager positions in EDs with 61,000 to 80,000 visits; clearly, these positions are no doubt warranted due to high overall volumes and complexity of operations.

In terms of professional staffing according to specific hours of operation, all emergency department respondents provide the highest levels of staffing during two specific time periods: 3:00 p.m. to 7:00 p.m. and 7:00 p.m. to 11:00 p.m. Increasingly, peak utilization in many EDs begins during the time period of 11:00 a.m. to 3:00 p.m.; staffing levels are only slightly lower during this time period versus the hours of 3:00 p.m. to 11:00 p.m. Generally, during peak hours of workload described previously, physician staffing coverage “doubles” or “triples”; two or three providers are in the department at one time, but in actuality, this represents “split” shifts of coverage. During such periods of peak workload, 3.0 registered nurses per physician are allocated except for hospital EDs with 61,000 to 80,000 visits, which reflect approximately 4.0 registered nurses per physician.

Operational Trend-Service Line Staffing

Dedicated functional/programmatic efforts to implement specific sub-specialization in the ED have received priority attention by many hospitals. Primarily, these include fast-tracks to expedite non-urgent patients; chest pain/observation units to improve timely intervention, monitoring and perhaps, admission avoidance; and finally, after-hours programs to provide easily accessible care to specific physician providers, i.e., pediatricians. These innovative approaches to patient care management require careful planning and must be developed correctly to achieve success.

Perhaps the greatest operational trend for EDs in recent years has been the implementation of specific service lines described previously. With appropriate patient volumes, these programs afford improved patient processing, cost-effective care management, and enhanced levels of both provider and patient satisfaction.¹⁹ From the survey of hospital respondents, a number of staffing arrangements were quantified for each specific service line as follows:

Fast-Track Services

Dedicated fast-track arrangements in the ED are typically staffed by a physician, registered nurse, technician, and a clerical person. This is true of the hospital survey respondents except those EDs with less than 20,000 visits; such programs are offered, but typically reside in existing beds of the ED and staffed with a single registered nurse. Physician assistants may also be utilized. However, these alternative providers were only identified in EDs with over 40,000 visits.

Pediatric After-Hours

After-hours care specifically for pediatric patients is similar in the development and operational aspects of fast-tracks. However, they often have limited hours of operation and typically are staffed by contracted pediatricians, not existing ED physicians. From the survey, hours of operation ranged from 4.0 hours to 6.3 hours with similar staff as those identified for fast-tracks. Due to the nature of pediatric care, nurse practitioners and physician assistants are often providers of choice with oversight by the attending ED physician.

The focus on pediatric care has also led to categorical development of pediatric emergency departments. Among pediatric EDs identified in the survey, facilities were open eight to 18 hours each day, with coverage shifting to the main ED during hours of closure. Clearly, even with a defined programmatic focus, operational costs often do not allow 24-hour coverage in terms of actual operations and staffing except in specific circumstances.

Chest Pain Center/Observation Units

In recent years, hospitals have embarked on the development of chest pain centers similar to the early intervention initiatives associated with trauma care. In addition, for non-threatening cardiovascular events and for other major medical conditions as well, the concept of observation units has received equal attention. While actually serving both of these patient populations with the concept of early definitive treatment/monitoring, it is interesting to note that most programs have limited programmatic staffing.

Typically, a physician is assigned to the area, yet is often not present unless called for consultation. This fact was highlighted in the survey of hospital respondents; primary staffing on a 24-hour basis is often a registered nurse and technician. Presumably, at point of admission to the unit, patients have already received several hours of tests/monitoring and are considered stable; all that is required in the defined unit is constant monitoring of the patient. In instances where a unit may also comprise the initial staging/intervention of patient care, other staff respond to the unit.

Occupational Medicine

The development of occupational medicine programs as a viable adjunct of the ED has evolved from direct contracting with employers rather than sole dependency on generating a specific range of ED visits. Care for the patient is similar in prototypes developed for fast-tracks and urgent care services; however, a separate entrance, waiting area, and dedicated personnel are not only necessary but usually mandated by employer groups. Hospitals with fewer than 20,000 visits can operate a successful program, as indicated in the survey of respondents, and is simply a function of commitment by the hospital and physician providers, available space to perform needed functions and aggressive contracting with employer groups.

Staffing can be creative, as evidenced in responses by hospitals. Some will have a dedicated staff with a registered nurse, technician, and clerical person-while others may incorporate a dedicated physician, nursing staff, and alternative providers (such as physician assistants). Similar to other programs of this nature, hours of operation are typically eight to 12 hours in duration.

Operational Trend-Physician Staffing Arrangements

The majority of physicians staffing emergency departments are contracted locally via independent physician groups. National and regional groups comprise the next largest

staffing arrangements, while salaried physicians approximate 25 percent. Increasingly, as hospitals become more heavily influenced by reimbursement challenges they will seek to decrease costs associated with current staffing arrangements.

Among all survey respondents, it is interesting to note that approximately 50 percent of all ED physicians are board certified in other disciplines, such as family practice and internal medicine. Since recognition as a specialty in 1979, some physicians have simply not elected to be grandfathered into the specialty while others have not opted to seek certification in emergency medicine.

The only exception to this fact is evidenced for EDs greater than 60,000 visits, which the overwhelming majority of physicians staffing the ED are board certified in emergency medicine. This is not uncommon in practice, however, since high volume EDs often represent academic medical centers or teaching hospitals that have emergency medicine residencies. Obviously, these facilities will be at greatest risk to effectively reduce costs per patient since they embrace additional teaching responsibilities and typically expend higher resources.

Conversely, registered nurse staffing in EDs often exemplify a wide range of specific certifications, including advanced cardiac life support (ACLS), advanced trauma life support (ATLS), and pediatric advanced life support (PALS). Among these primary certifications, ACLS is the most common and according to survey respondents, is held by the majority of registered nursing staff. Over 70 percent of registered nurses have been certified in ACLS, even in EDs with less than 20,000 visits. Other certifications have varying levels of compliance and are typically due to the range of ED services provided.

Operational Trend-ED Functional Requirements

Emergency departments have continued to expand the functional square footage required for growing patient volumes, higher patient acuities, and new program developments such as fast-tracks and observation units. This will pose a serious operational challenge for many departments in the future as they seek to acquire increased functional space with fewer capital dollars. For many institutions, even if visit levels remain constant, acuities will increase with the aging of the population and therefore, functional expansion will become a mandate to improve overall patient processing times.

On average, EDs have approximately 8,000 square feet of departmental space for all functions, according to survey respondents. However, this ranges from EDs with less than 20,000 visits with 3,000 square feet to the largest volume EDs exceeding 60,000 visits, which can approximate over 19,000 square feet.

Hospitals differ widely in the number and mix of current rooms as well as the number and type planned for the future. Among survey respondents, the following data observations are noteworthy:

- ♦ EDs less than 20,000 visits indicated a range of typical departmental configurations, such as major medical rooms, examination rooms, EYE/ENT rooms, fast-track, etc., similar to higher volume departments, but with fewer required rooms. In the future, these EDs indicated a critical need to expand

capabilities/functional space for trauma and cardiac resuscitation, total monitored beds, and minor exam/treatment beds.

- ◆ Among EDs encompassing 21,000 to 40,000 visits, critical expansion needs were identified for chest pain beds, major medical beds, total monitored beds, pediatric beds, and treatment bays for observation patients. These departments also highlighted the need for in-department radiology services that historically have been performed in the radiology department. EDs representing visit volumes between 41,000 to 60,000 visits have provided a wide array of services simply due to the volume of patients served. No discernible differences among the respondents were noted in future expansion efforts except the addition of pediatric related services and cardiac/trauma resuscitation.
- ◆ Of the highest volume EDs (those representing over 60,000 visits per year) a significant trend was noted in total monitored beds required in the future as well as marked expansion in dedicated radiology rooms exclusively for ED patients. Clearly, these EDs have perhaps witnessed the greatest shifts in patient acuities due to their overall service orientation.

Operational Trend-Ancillary Service Provision

Historically, most ancillary services provided to ED patients were either very limited if dedicated in the department and/or within physical proximity to the department. This fact has largely changed with new technologies deployed in the ED, a trend that will likely continue. As the ED evolves with this technology concomitant with growing visits and patient acuities, it will become a centralized hub of unscheduled diagnostic and therapeutic services.

Two of the most significant trends identified by survey respondents involved the need for dedicated information systems, namely patient tracking systems and capabilities to perform bedside/portable registration. Other trends included the need for automated medication dispensing and portable laboratory testing in the ED. Overall, these trends were significant for EDs representing all visit volumes with one important exception—EDs with 41,000 to 60,000 visits noted the aforementioned system-wide trends as well as the critical need to add in-department capabilities for CT scanning and ultrasound services.

Operational Trend-Information Systems

Computerized management information systems dedicated for the ED continue to be developed. Historically, many departments have been dependent on hospital-wide systems that do not offer the required functionality or user-friendliness needed. At present, EDs appear only moderately satisfied with current “out-of-the-box” applications to enhance patient care management and therefore, continue to enhance required functionality internally.

Levels of user satisfaction among the various information systems available to all ED visit groupings varied and are categorized as follows:

Triage

Among hospital respondents, 30 percent rated existing vendors “high” in terms of overall user satisfaction; most others reported moderate satisfaction.

Registration and Order Entry

Nearly equal percentages of respondents, approximately 20 percent, rated these applications as “high” in terms of overall user satisfaction; most identified “moderate” satisfaction with their existing capabilities.

Ancillary Results Reporting

Among all ED groups, levels of satisfaction varied greatly. Overall, approximately 33 percent indicated “high” satisfaction with ancillary services reporting. The lowest volume EDs, less than 20,000 visits annually, had the lowest rating of satisfaction; only 16 percent indicated “high satisfaction” with vendor applications for results reporting.

Charting and Discharge Instructions

Only recently have information systems vendors provided specific applications for EDs in the area of real-time on-line charting, including discharge instructions. Due to this recent trend, few EDs indicated the presence of such applications. However, large numbers of providers are implementing optical archiving of charts. EDs with 21,000 to 40,000 visits identified the largest inventory of installed applications, with highest satisfaction levels occurring in systems providing primarily discharge instructions.

Summary

A number of industry studies and metrics are noted for the ED and illustrate the complexity of this important department. What do these various studies mean collectively and how can they be interpreted to aid in operational improvement efforts?

First, for most ED's the future reflects growing patient populations and increases in higher acuity types. Even if an ED has stable or slightly declining visits over time, the likely result is that fewer ED beds will be available for patients at any given time. Longer lengths of stay will always place pressures on bed turnover first rather than the net increase/decrease in daily ED visits.

Second, all EDs differ in the numbers and types of patients who seek care, particularly at different time periods of the day. While benchmarking information is important to consider when assessing and planning operational improvements, ED metrics are only valuable when compared to other EDs of similar characteristics such as number of overall visits. Even then, data is informational only and should not be used as standards.

Third, staffing efficiency among nurses and physicians are influenced by peak departmental volumes and presenting patient acuities. While nurse staffing/team productivity measures are more predictive in practice, they can vary widely for physicians. Patients per hour per physician are very dependent on how quickly patients are placed in an exam room, degree of ancillary responsiveness and test reporting, consults required by other physicians and effectiveness of inter and intra-departmental communications.

Overall, the unique circumstances of each ED will dictate the extent to which changes are required in overall operations, numbers and types of rooms, staffing complements, ancillaries and information management. EDs operate under very different periods of peak surge capacity and must always compete with other institutional needs for services, such as inpatient beds and diagnostic technologies.

Figure 2.1: Hospital/Emergency Department Utilization, 1980–2000 Percentage Change

	1980	1990	2000	% Change
U.S. Population *	226 million	250 million	281 million	24.3
Hospitals **	6,965	6,649	5,810	(16.5)
Beds	1.36 million	1.21 million	983,628	(27.6)
Admissions	38.9 million	33.8 million	34.9 million	(10.2)
Emergency Departments ***	4,555	5,024	4,148	(8.9)
Visits	82.0 million	92.1 million	107 million	30.4
Visits/1,000 population	363	368	384	5.3
Outpatient Departments				
Visits	263.0 million	368.1 million	486 million	84.7
Visits/1,000 population	1,163	1,472	1,729	48.6

* U.S. Bureau of the Census, 1981, 1991, 2002 editions.

** Hospital Statistics, 1981, 1991-1992, 2001-2002 Editions. Chicago: American Hospital Association.

*** Total U.S. hospitals responding to survey.

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