Our Goals and Objectives

- Defining the critical variables in staffing an emergency department.
- Identifying the key concepts that drive your strategies in meeting your staffing needs.
- Building out staffing models based on challenging and often competing priorities...
Staffing Your ED - An Outline for Our Time Together:

- Setting goals and targets for staffing decisions
- A relatively deep dive into ED Physician staffing
  - MDs/APPs/Scribes/Alternative models
- Demand-Capacity modeling, planning, and staffing
- RN staffing
- Appendices:
  - Physician/APP Demand/Capacity-Based Back-Up Systems
  - The Simple Math Behind Modeling Workloads and Capacity
  - Benchmarking Staffing and Performance

Why is Staffing So Important?

On average, staffing costs represent ~75% of all Emergency Medicine group costs.
Why is Staffing So Important?

“No margin, no mission…”

How well you match your staffing (costs) to your workload (revenue) through staffing and scheduling determines the profitability of your physician group, nursing staff, and hospital…

An Overview of the Drivers of ED Staffing

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Managing Your Hospital’s Expectations...

There is the occasional challenge or disagreement...
We Are All in This Together—
Nursing Staffing, Skills, Expectations, and Teamwork have a major impact on physician(APP staffing needs...

How a Hospital Typically Sets Goals and Objectives for ED Physician and Nurse Staffing...

External Drivers

- External Benchmarks
  - Professional organizations (MGMA, ACHE, ENA, EDBA)
  - Consulting groups
  - ED staffing companies and groups
- Cost
- Complaints and Anecdotes
- The Neighborhood

Internal Drivers

- Hospital leadership typically considers physician compensation and the overall spend
- Nursing staffing is often based on the previous year’s budget, volume trends and often a set of benchmarked numbers...
How a **Physician Group** Often Looks at Analyzing and Setting Goals for ED MD/APP Staffing…

- **The Group’s Internal Driving Forces**
  - Patient volume and acuity
  - Compensation
  - RVUs - Patient acuity and work effort (complexity)
  - Internal performance standards
  - Ease of recruiting/retention
  - Lifestyle

- **The Group’s External Driving Forces**
  - Customer/Client Satisfaction (Key Clients and Stakeholders include - Patients, Nursing, Attending Physicians, the Hospital Board…)
  - Operational performance standards
  - Special Causes - e.g.- Stroke center, Cardiac center, “30 Minute Guarantee”…
  - External Benchmarks
  - Compensation, ease of recruiting, and retention

---

**Patient Volume, Acuity and Variation as Key Drivers of Staffing…**
Patient Arrivals:

- Know your ED’s patient arrival volumes, acuity, and patterns.
  - Analyze patient arrivals and acuity by hour of the day (HOD) and day of the week (DOW).
- Knowing your patient arrival curve by HOD and DOW, you can schedule your staffing to stay ahead of patient arrivals and acuity.
  - Identify “heavy” (greater than average) and “light” (less than average) days. Creating different staffing schedules for these days is a prudent use of your resources.
  - Although Sundays, Mondays, and the day following a holiday are generally heavier-volume days, you will want to compare average volumes and variation from the average for each day of the week.
- Review average daily visit volume for each of the most recent 24 months to determine seasonal fluctuations.
- From a macro perspective, review annual arrivals over the past five years in order to understand trended historic growth and anticipate future growth.
- Benchmarking - Establish targets for how many patients per hour your practice can realistically or comfortably see. Also consider stretch goals for PPH and LOS.

Demand vs. Capacity

Example – Main ED Area

**FINDINGS** - The patient arrival and staffing (Demand-Capacity) graph above highlights the following mismatches:
Main - Understaffing - missing the patient arrival ramp-up (begins at 1000) and overstaffing twice later in the day (1400 and 2200)...
Staffing an ED Appropriately and Efficiently

• "There are two ways of looking at how staffing affects operational efficiency and service. For one, the more efficient your doctors are, the less coverage you need. On the other hand, if you are trying to drive throughput or flow through a system with fixed capacity, such as the ED, and if your space is limited, then you actually need higher staffing levels to drive throughput."

• "If ED beds are a rate-limiting step, which they are for many EDs, then you actually need more staff to drive efficient throughput than you would if you had the beds you needed."

• "The ED by its nature is often either overstaffed or understaffed because patient volume is not evenly distributed. Many smaller EDs have as much as a 40% variation between their slowest and busiest days, so peak load crises are inevitable. The real question is how many are tolerable? How far do you bend before you break?"
The Impact of Patient Acuity

- Higher acuity patients require additional staffing resources for evaluation, management, treatment and disposition...
- And you must have a realistic understanding of your server(s) capacity...
  - Doctors/Nurses/Beds...

Patient Length of Stay (LOS)

- Longer patient LOS requires more staffing time and attention...
- Longer LOS also reduces the number of available beds...
- Nursing needs to factor in the increased workload generated by lengthy LOS and/or Boarding Hours...
The Impact of Boarded Patients

If you are responsible for “boarded patients” (those awaiting admission to an inpatient unit but who are still located in the ED), then:

• Your staffing resources will be reallocated in order to monitor and treat these patients.
• Your bed capacity will be reallocated to monitor and treat these patients.
• Your ability to meet incoming patient demand is effectively reduced.

Examining fluctuations in ED volume:
What should capacity look like to guarantee quality care?

Staff to peak loads?

Staff to averages?

Eugene Litvak, PhD, Boston University
Peak Loads*:

- Staffing to eliminate peak loads entirely will put you out of business…
- Failing to staff to minimize peak loads will put you out of your contract…

*Paraphrasing Ron Hellstern, MD
Identifying Your Patient Flow and Staffing Bottlenecks by Key Server (MD/APPs, RNs, Beds) and by HOD

Waiting lines/queues form when capacity exceeds demand at various servers. When this happens bottlenecks begin to form. The bottleneck defines the speed and limits the flow of entities through a system. Begin looking for bottlenecks by identifying servers/areas with high utilization.

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### Analyzing ED Patient Arrivals (Volume & Acuity) by Yearly Volume

#### Volume-Band Analysis of Split-Flow Arrival Patterns:

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### Tables adapted from the previous work on ED segmentation by Dr. Jody Crane and Dr. Kirk Jensen (see pp slide 20 in Jensen, Crane. Operational Strategies for Lower Acuity Patients) © 2017 Kirk Jensen, All Rights Reserved
Example chart. Do not use this background.

Putting It All Together - DCM Modeling & Staffing

ESI Level 1 2 3 4 5
Percentage 1% 9% 50% 35% 5%

Narrative:
For a 40K visit ED look for opportunities to selectively apply effective patient segmentation principles based on acuity mix.

For lower acuity sites with higher numbers of ESI Level 4 and 5 patients (2-5 patient per peak), consider running a fast track/ super track to effectively segment flow during peak hours (9am – 11pm).

Operational approach:
- Immediate bedding when available, MO go from high to low acuity, APP from low to high
- Fast track hours matched to peak loads
- Quick nurse triage to segment, Quick bedside registration for all
- For EDs with low acuity low flow (1-2 pts/hr), consider running a fast track/super track with 1 APP with committed resources for triage
- Results waiting area

Assumptions:

General Principles

Operational recommendations

Workload vs. Actual Capacity

ESI Level Distribution

Workload (i.e. physician hours needed) by HOD

FTEs (i.e. physician hours available)

Actual Capacity (i.e. adjusted FTEs)

PROJECTED DEMAND

Patient Arrivals

Workload

PROPOSED CAPACITY LEVEL

Staffing Level MD

Staffing Level APP

Staffing Level Scribes

FTEs

Actual Capacity (i.e. adjusted FTEs)

Utilization

What are reasonable staffing and performance expectations and metrics?

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ED Physician Staffing and Performance Standards

- **Sensible and fair** operational standards for ED physicians
  - Bed Placement to MD Exam
  - Results Available to MD Review
  - ED Physician-specific customer satisfaction scores

- **Common but perhaps suspect** operational standards for ED physicians
  - Ambulance diversion
  - Overall ED patient length of stay on any patient stream
    - Admitted ED patients
    - Discharged ED patients
  - ED admission time
  - Walkaways
  - Overall patient satisfaction with the ED

What are reasonable physician and/or APP productivity metrics?
For moderate acuity EDs, 2.5 patients per hour should not be exceeded...
How Productive Can or Should Your MD’s Be? (i.e. How many Docs do you need?)

- Past numbers often quoted 2.3-2.8 patients per hour…
- We are living with our “New Reality…”
  - Patient complexity, patient acuity, customer service, skilled workforce shortages, crowding, boarders, risk management…
- Should you use PA’s, NP’s?
  - Alone or with an MD?
- Should you use Scribes?
- How is nursing staffing?
- And how does your MIS system impact your flow…

- To the extent that a range can be established, 1.5 - 2.5 patients per provider per hour with traditional operational models and acuities…
- Some of the newer operational models may allow for higher pph levels…

Building the Actual Schedule

Your approaches to scheduling could include:

- A review of historical staffing patterns
- Aligning clinician performance and compensation.
- Make sure the low acuity service line (ESI 5s, 4s, and select 3s) is adequately resourced (space, staff, supplies) and busy at all times
- Staffing for your ESI 2s, 3s, and 4s - err on the side of staffing “fat” or “heavy” to handle variations in volume and acuity
- Factor in physical layout, beds, visual sight lines, communication, space, nursing staffing, attending coverage, back end flow, etc..
- Team-based patient care processes - front-loading your patient care,
- Rule-based computer scheduling programs can allow for the efficient generation of draft schedules
Select Observations on Your Approach to Staffing:

- Anticipate patient demand, and use a reasonable asset velocity (patients evaluated per hour-PPH) for the clinician(s) treating the arriving patients.
- With an agreed upon asset velocity (PPH) build out the number and duration of shifts, as well as how many hours annually you expect your clinicians to work.
- “Praise the Lord and pass the ammunition” – don’t overlook the benefits of a dedicated nocturnist
- Ease of recruiting and your group’s historic staffing retention rate are crucial drivers of your staffing strategy
  - Certain EDs are easier to staff than others. Staffing in a major city or suburb with several emergency medicine training programs and plenty of physicians and nurses is vastly different than staffing and scheduling an ED in a rural area with no training programs and fewer amenities.
- Make sure you plan for clinicians with staffing constraints e.g., limited availability on weekends, holidays, and nights versus those who will rotate nights, evenings, days, weekends, etc.
  - If you are not careful, the clinicians with staffing restrictions will drive (impair?) the schedules of those with the most availability and flexibility

Leveraging Your Available Talent Pool:

- Employ the least expensive resource to accomplish the mission.
- APPs - In many EDs, up to 25-35% of the cases can often be effectively and successfully seen independently by APPs.
- Family practitioners or internists can see up to 75% or more of the cases that emergency physicians see in some EDs (for a lower staffing cost…).
- Optimize your use of scribes and techs
- SOPs and advanced treatment protocols, developed and implemented with nursing’s participation, can drive efficiency and reduce variation.
- On average, the use of residents in the ED is only a net gain when you are using senior-level residents (final year). In general, new residents only add complexity and slowness to the EM clinician’s day.
Deciding When to Add Coverage

Identifying your trigger or pain points for adding extra coverage:

- Patients seen per hour (PPH) – Your asset velocity (PPH) routinely exceeds your desired target(s).
- Turnaround times become progressively longer.
- LWBS rates are unacceptably high.
- Your clinicians are concerned - shifts are too long or too busy.
- Patient satisfaction survey results are unacceptably low.
- There are frequent concerns or complaints about clinician behavior in a stressful environment.
- Leverage predictive modeling – mapping forecasted and trended volume and acuity against clinician hours – and identifying thresholds or trigger points for adding staff.

It is important to differentiate routine variation in patient volume from trended or progressive increases in volume. While both of these result in additional demand and complexity for the ED clinical and nursing staff, the solutions will be different.

Worrisome Symptoms:
- Elevated patient throughput times
- High left-without-being-seen rate
- Low patient satisfaction
- Clinician behavior in a stressful environment
- Low clinician satisfaction and retention

The four key drivers of patient satisfaction:
- Length of stay
- Quality of the interaction with providers
- Quality of the explanation
- Pain management
The Challenges One Faces with Single Physician Coverage & 12-hour Shifts

- Single physician coverage - 8760 hours in a year x 2PPH = 17,520 patients per year
- 64% of the daily ED volume arrives between 10 a.m. and 10 p.m.
- In an ED with 18,000 annual visits and single coverage, patients are being processed at 2.63 patients per hour during this peak presentation period.
- During the remainder of the day (10 p.m. to 10 a.m.), patients are seen at less than two patients per hour.
- Workable strategies to accommodate increased demand during the 10 a.m. to 10 p.m. shift include:
  - Productivity-based compensation,
  - Template based charting,
  - ED efficiency initiatives,
  - Scribes or personal productivity assistants,
  - Rapid medical evaluation,
  - On-call clinician backup,
  - A transition to eight-hour flex length shifts (shifts that can be two or more hours shorter or longer depending on patient demand), and
  - APPs.

A Note on Performance - Based Staffing and Payment Models:

- Clinicians often operate more effectively and efficiently when performance and compensation are more closely aligned.
- Compensation programs that align RVU production or PPH with overall earnings are often able to accomplish better alignment of staffing goals, strategies, and productivity.
- Performance-based production and pay models - aligning the right clinician with the right patient acuity stream becomes an opportunity to optimize both value and return.
- The caveat to remember here is that the lowest cost staffing resource that effectively does the job should always be maximized first.
Advance Practice Providers (APPs) in the ED

- APPs give terrific **flexibility** and allow coverage to be added in a cost-effective way when and where it is needed.
- APPs often prove most productive in a **fast-track type of environment**
- APPs in the **main ED** can be of great use, particularly in areas where physician recruitment and retention are exceedingly difficult.
  - It is not unusual to see mid-level providers averaging only 1 to 1.3 patients per hour when working in the main room.
  - However, when you compare their costs, APPs can still be efficient and effective productive team members within a main emergency department staffing plan.

Scribes and Personal Productivity Assistants (PPAs):

What can scribes do for you?

- Complete the chart, order imaging studies and labs, and keep you on task.
- Cognitive off-loading
- Assist in real-time problem solving by being an extender for the physician or APP - improve coding, improve overall asset velocity.
  - Scribes allow for more complete charting,
  - Scribes prompt you for elements that will result in optimizing coding,
  - Scribes assist in promptly getting test results, particularly when they relate to multiple patients.
- Patient rounding assistance for comfort and follow-up with patients and
- Assist nursing and medical-assistant team members in improving overall patient flow.

The Case for Using Scribes (data from Inova Fairfax Hospital, Virginia)

- **18–20% increased charge capture** (via reduction in downcodes when record documentation fails to substantiate care rendered)
- **Asset velocity of 2.3 – 2.5 pph** (pre-scribes 1.9 pph).
- **Improved RVU per hour production of 15–20%**
- **89% lab documentation** (pre-scribes 55%).
- **Improved ratio of compliments to complaints 9:1 per 1000 visits** (pre-scribes 5:1).
In many EDs, nurses effectively run the department, and it is the nurses who keep patient care and throughput flowing.

If nurse staffing levels and/or experience are not where they need to be, then no amount of physician coverage can compensate for it.

While ED clinicians do not and can not control nurse staffing, there is a management paradox here:
- You need to know what your MD/APP/Scribe staffing levels are,
- You need to know what the RN staffing levels are,
- You need to know what staffing benchmark data RN management/staff is using,
- You need to know the impact on nursing of prolonged LOS and/or boarding
- And you need to know how many nursing shifts are going unfilled…and why…

Nursing and nursing staffing levels have a major impact on patient care, patient throughput and on what the Emergency Department team can accomplish.

"Emergency physicians may be the scarcest resource in the ED, but they are not the most valuable resource…"
Benchmarking Nurse Staffing and Productivity

Emergency Department Benchmarking Alliance (EDBA) Figures*:
*Reported in Fall of 2016

- RN:
  - ~.60 ED patients per RN Hour
  - = 1.66 RN hours/ED Patient
- Techs and Clerks:
  - ~1.38 patients per hour
  - = .72 Tech/Clerk hours per ED patient

**Optimizing Your Staffing Patterns for Service, Safety, and Volume**

**Traditional Staffing Model**
- = $270/Hr

- Physician $125
- Clerk $15
- Nurse $40
- Nurse $40
- Tech $15

**Flexible Staffing Model**
- = $318/Hr

- Physician $140
- Clerk $20
- Scribe $18
- Nurse $40
- Nurse $40
- Tech $20
- Tech $20

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Nursing Demand-Capacity Management
Nurse Staffing and Ratios
An Integrated Approach to Capacity Planning

How the Nursing Schedule Typically Gets Created:

- An annual budgeting process
- The budgeting process is frequently based on historic numbers and previous staffing levels
- There is often a set of benchmarked staffing numbers which target nursing hours per patient visit
  - You should know what these are and where they come from...
- Nurse staffing models are often based on bed ratios (e.g. 4 beds per nurse)
- Patient volume, acuity, occupancy, and boarding drive staffing needs
- Occupancy is directly proportional to LOS
- Changes in staffing patterns should result from careful analysis of patient demand – volume, complexity, and arrival patterns – and a realistic appreciation of staffing capabilities and capacity.
Staffing Your ED - Closing Observations:

- A consistent and thoughtful approach to staffing is necessary to achieve optimal results.
- An accurate assessment of demand, capacity, and variation is critical to your success.
- Physician staffing cannot be looked at in isolation. It must be contextualized relative to nurse staffing, bed constraints, physical space, layout, skill mix and acuity mix.
- A keen understanding of the true capacity of your key servers is essential – “Doctors/Nurses/Beds…” and effectively aligning each of the key servers with demand…and with each other…
- Remember that “A bad system will beat a good person every time.”  W. Edwards Deming
- The best staffing models and schedules require a thorough appreciation of the science, art and business of staffing an emergency department.
APPENDIX A:
Emergency Department Physician Back-up Systems
ED Physician Backup Systems

- The best systems are formalized and based on **expediting Bed Placement to MD Exam**
- An ED backup system should incorporate plans for the **hospital to provide its members of the backup team** to support the ED when the ED is overwhelmed.
  - **A potential word of warning** – one should probably resist an ED backup system unless or until your hospital provides backup systems to support the ED and the ED MD when the ED is overwhelmed – you must be very careful with this observation…
- Backup systems are most valuable and most effective when they are incorporated into **hospital backup systems** with **pre-defined thresholds, triggers, and next actions** that have been trialed and agreed upon before the crisis ever happens
  - High census protocols
  - RN's/Tech's can come to the ED to provide “30 Minute Resource”
  - Alternative sites(s) for ED Admission(s)

*None of this is as easy as it sounds…*

---

Potential First Steps In Staffing an Emergency Department  ED On-Call System

- **“Jeopardy Call” ± 2-4 hours** at the beginning and end of shift based on pre-defined time performance standards
- Create **formal overlapping shifts**
- Formalized **dedicated call** schedule
- All On Call Systems should have:
  - **An activation process** formalized and based on pre-defined criteria jointly agreed to by hospital and EDMD leadership
  - **The Charge Nurse and the “Officer on Deck”** make the decision to activate the ED MD and other backup systems based on pre-defined time standards
On-Call System Activation - Roles and Responsibilities - Food for Thought...

- Dedicated Physician position ("Physician-in-Charge"/ "Officer of the Deck") with whom the Charge Nurse communicates

- Charge Nurse gives Physician-in-Charge opportunity ("X" minutes or "Y" solution) to correct performance failure

- Charge Nurse activates backup if Physician-in-Charge is unable to fix within the predetermined designated time period or parameters

When Your ED is Overrun
Accurately Assessing Who and What is Needed: Making the Right Diagnosis, and Deploying the Right Treatment Plan...

- Be sure you aren’t being asked to cover hospital short-staffing, inappropriate staffing, poor ancillary service support, poor medical staff support, or lack of in-patient beds...

- Remember the Rule of 5:
  - EM providers
  - Nursing/techs
  - Ancillary services
  - Administration
  - Consulting/admitting medical staff

Courtesy of Ron Hellstern, MD, FACEP
APPENDIX B:
Physicians, Nurses and Beds -
The Simple Math Behind Modeling Workloads and Staffing Needs for Your Critical Servers

Physicians, Nurses and Beds
The Simple Math Behind Modeling Workloads and Staffing Needs for Your Critical Servers
Estimating the Number of Docs

The number of physicians can be correctly calculated if you know three pieces of data:

- The average number of hourly arrivals (pts/hr)
- The average physician service rate (pts/hr)
  - Most physicians understand and can readily estimate their service rate in patients seen per hour.
  - The average in the US usually falls between 1.5 and 2.2 pts/hr
  - Service rates in the 2.5-3.0 pts/hr can be expected in an intake team
  - If you don’t know what number to use, use an estimate 1.6/1.8/2.0/2.2 pts/hr until you know your actual number(s)
- Your desired physician utilization rate (to account for variation and minimize queuing)

\[
\frac{(\text{Avg hourly arrivals})}{(\text{Average physician productivity})} \times \frac{100}{\text{(Desired % Utilization)}} = \text{# of Docs needed}
\]

Let’s do the math on the slide:

\[
\frac{(4.0)}{(2.0)} = 2.0 \quad \frac{(4.0)}{(2.0)} \times \frac{100}{80} = 2.5 \text{ docs}
\]

Assumptions:
- Average hourly patient arrivals = 4 pph
- Average Physician productivity = 2pph
- Desired utilization = 80%

© Jody Crane, MD, MBA, and Kirk B Jensen, MD, MBA
Estimating the Number of Nurses

The number of nurses can be correctly calculated if you know three pieces of data:

- The average number of hourly arrivals (pts/hr)
- The average nurse service rate (pts/hr)
- Nurses benchmark productivity based on worked hours per patient (hrs/pt)

- To convert this to a service rate (pts/hr), use the inverse = (1/worked hrs/pt)
- Service rates in the 1.25-1.5 pts/hr can be expected in an intake team
- If you don’t know what number to use, use a percentage of your doc service rate
- Your desired nursing utilization rate (80% if you don’t know)

\[
\text{# of Nurses needed} = \frac{(\text{Avg hourly arrivals}) \div (\text{Average nurse productivity})}{(\text{Desired % Utilization})}
\]

Assumptions:
- Average hourly patient arrivals = 4 pph
- Average Nursing productivity = .62 pph
- Desired utilization = 80%

\[
\begin{align*}
# \text{ of Nurses needed} &= \frac{4.0}{0.62} = 6.45 \\
\text{Desired Utilization} &= 80% \\
# \text{ of Nurses needed} &= 8.06 \text{ nurses}
\end{align*}
\]
Length of Stay Impact on HPPV*

*HPPV = Hours Per Patient Visit

- Because of the nature of nursing work, HPPV requirements vary based on Length of Stay
- Reducing length of stay to 90 minutes or lower can decrease required staff by more than 20%

Estimating the Number of Beds

\[
\text{# of beds needed} = \frac{\text{(Avg hourly arrivals) \times (Average In-Bed LOS in hours)}}{\text{(Desired \% Utilization)}}
\]

- Assumptions:
  - Average hourly patient arrivals = 4 pph
  - Average LOS = 120 minutes or 2 hours
  - Desired bed utilization = 80%
APPENDIX C: Benchmarking Staffing and Performance

Benchmarking Metric Driven Management: You Need Comparative Data - Benchmarking Resources

Where to find data:
- Your neighbors
  - Call and/or visit
- ED Benchmarking Alliance
  - www.edbenchmarking.org
- ACEP
  - http://www.acep.org
- Premier
  - www.premier.com
- VHA
  - www.vha.com
- UHC
  - www.uhc.org

Be sure to compare hospitals with similar acuity and similar volume...
Benchmarking

- Establish goals for how many patients per hour your physicians will treat by benchmarking externally and internally.
- Establish goals for how many hours per patient nursing will staff by benchmarking externally and internally.

The following groups are recommended for external benchmarking:
- Medical Group Management Association (www.mgma.com)
- Emergency Nurses Association (www.ena.org)
- ED Benchmarking Alliance (www.edbenchmarking.org)
- ACEP (http://www.acep.org)
- Premier (www.premier.com)
- VHA (www.vha.com)
- UHC (www.uhc.org)

Your neighbors, call and/or visit.

You should also do your own independent benchmarking in addition to what your hospital or healthcare system supplies you. This may be done by accessing benchmarking data sets. This can also be facilitated by discussing staffing patterns with your colleagues, and/or visiting local contemporaries who direct EDs. This can be expanded outside of your immediate market area to colleagues within the region. As you compare your ED staffing needs, be sure to understand similarities and dissimilarities with hospitals with which you are benchmarking, e.g. admission percentage, LOS, etc.

ED Benchmarking Alliance

- The EDBA is an advocate for improved emergency care, with a multidisciplinary membership and meeting structure and a sharp focus on improving emergency department operations. The group serves as a source of reliable information related to actual ED operations.
- The EDBA represents ~800+ hospitals; the data is current. The EDBA core mission is to support the EM community through data sharing, education, consensus building, research and political advocacy. The EDBA is not-for-profit and has no commercial interests attached. Costs of membership are extremely reasonable.
EDBA 2015 Cohort Summary

<table>
<thead>
<tr>
<th>Year of Ed</th>
<th>All EDs</th>
<th>Over 100K EDs</th>
<th>80 to 100K EDs</th>
<th>60 to 80K EDs</th>
<th>40 to 60K EDs</th>
<th>20 to 40K EDs</th>
<th>Under 20K EDs</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015 Results</td>
<td>1,338</td>
<td>46</td>
<td>58</td>
<td>139</td>
<td>276</td>
<td>420</td>
<td>322</td>
</tr>
<tr>
<td>Percent</td>
<td>65%</td>
<td>68%</td>
<td>67%</td>
<td>68%</td>
<td>69%</td>
<td>64%</td>
<td>60%</td>
</tr>
<tr>
<td>Hi CPT Admit</td>
<td>16.9%</td>
<td>17.9%</td>
<td>13.6%</td>
<td>17.3%</td>
<td>14.8%</td>
<td>18.9%</td>
<td>18.2%</td>
</tr>
<tr>
<td>Hi CPT Transfer</td>
<td>16.4%</td>
<td>20.4%</td>
<td>23.0%</td>
<td>20.0%</td>
<td>18.7%</td>
<td>15.2%</td>
<td>10.7%</td>
</tr>
<tr>
<td>Hi CPT EMS Arrival</td>
<td>1.8%</td>
<td>1.0%</td>
<td>0.9%</td>
<td>1.2%</td>
<td>1.5%</td>
<td>2.1%</td>
<td>3.3%</td>
</tr>
<tr>
<td>Hi CPT EMS Arrival Admit</td>
<td>17%</td>
<td>24%</td>
<td>22%</td>
<td>21%</td>
<td>19%</td>
<td>15%</td>
<td>12%</td>
</tr>
<tr>
<td>Hi CPT ED Arrive Median LOS</td>
<td>37%</td>
<td>41%</td>
<td>43%</td>
<td>43%</td>
<td>41%</td>
<td>36%</td>
<td>28%</td>
</tr>
<tr>
<td>Hi CPT Treat &amp; Release LOS</td>
<td>180</td>
<td>242</td>
<td>245</td>
<td>212</td>
<td>195</td>
<td>162</td>
<td>136</td>
</tr>
<tr>
<td>Hi CPT Fast Track LOS</td>
<td>154</td>
<td>205</td>
<td>205</td>
<td>180</td>
<td>165</td>
<td>140</td>
<td>120</td>
</tr>
<tr>
<td>Hi CPT Admit LBTC Door to Doc</td>
<td>116</td>
<td>140</td>
<td>140</td>
<td>125</td>
<td>115</td>
<td>93</td>
<td>72</td>
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<tr>
<td>Hi CPT EKG per 100 ED Patients</td>
<td>303</td>
<td>381</td>
<td>381</td>
<td>350</td>
<td>323</td>
<td>277</td>
<td>239</td>
</tr>
<tr>
<td>Hi CPT Xray per 100 ED Patients</td>
<td>2.6%</td>
<td>4.4%</td>
<td>4.0%</td>
<td>3.3%</td>
<td>2.9%</td>
<td>2.5%</td>
<td>1.5%</td>
</tr>
<tr>
<td>Hi CPT CT per 100 ED Patients</td>
<td>28</td>
<td>46</td>
<td>40</td>
<td>33</td>
<td>29</td>
<td>19</td>
<td>12</td>
</tr>
<tr>
<td>Hi CPT MRI per 100 ED Patients</td>
<td>25</td>
<td>32</td>
<td>30</td>
<td>29</td>
<td>26</td>
<td>17</td>
<td>10</td>
</tr>
<tr>
<td>Hi CPT US per 100 ED Patients</td>
<td>44</td>
<td>45</td>
<td>49</td>
<td>49</td>
<td>45</td>
<td>24</td>
<td>17</td>
</tr>
<tr>
<td>Hi CPT % Hosp Admits thru ED Visits</td>
<td>21</td>
<td>23</td>
<td>24</td>
<td>24</td>
<td>22</td>
<td>19</td>
<td>12</td>
</tr>
<tr>
<td>Hi CPT Visits per Foot Beds</td>
<td>1,514</td>
<td>1,590</td>
<td>1,463</td>
<td>1,591</td>
<td>1,584</td>
<td>1,584</td>
<td>1,334</td>
</tr>
<tr>
<td>Hi CPT Visits per Space Bed</td>
<td>114</td>
<td>181</td>
<td>161</td>
<td>135</td>
<td>128</td>
<td>98</td>
<td>67</td>
</tr>
<tr>
<td>Hi CPT Admit Time</td>
<td>65%</td>
<td>71%</td>
<td>73%</td>
<td>61%</td>
<td>67%</td>
<td>68%</td>
<td>67%</td>
</tr>
</tbody>
</table>

Pediatric EDs 2015 Results

| Over 100K EDs | 46 | 68% | 17.9% | 20.4% | 1.0% | 24% | 41% | 242 |
| 80 to 100K EDs | 58 | 67% | 13.6% | 23.0% | 0.9% | 22% | 43% | 245 |
| 60 to 80K EDs | 139 | 68% | 17.3% | 20.0% | 1.2% | 21% | 43% | 212 |
| 40 to 60K EDs | 276 | 69% | 14.8% | 18.7% | 1.5% | 19% | 41% | 195 |
| 20 to 40K EDs | 420 | 64% | 17.9% | 15.2% | 2.1% | 15% | 36% | 162 |
| Under 20K EDs | 322 | 60% | 18.2% | | 10.7% | 3.3% | 12% | 136 |

Pediatric EDs 2015 Results

| Total | 38 | 46% | 84.0% | 10.0% | 0.9% | 8% | 26% | 144 |
| Adult EDs | 112 | 72% | 4.4% | 24.3% | 1.2% | 24% | 45% | 236 |

Urgent Care, Freestanding EDs 2015 Results

| Total | 60 | 55% | 16.9% | 8.9% | 3.6% | 6% | 23% | 126 |

Benchmarking Nurse Staffing and Productivity

Emergency Department Benchmarking Alliance (EDBA) Figures*

*Reported in Fall of 2016

- RN:
  - ~0.60 ED patients per RN Hour
  - = 1.66 RN hours/ED Patient
- Techs and Clerks:
  - ~1.38 patients per hour
  - = .72 Tech/Clerk hours per ED patient

ED Staffing Ratios 2015

<table>
<thead>
<tr>
<th>RN</th>
<th>Techs and Clerks</th>
<th>Physician</th>
<th>Physician and APP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Over 100K</td>
<td>0.68</td>
<td>1.28</td>
<td>3.26</td>
</tr>
<tr>
<td>80 to 100K</td>
<td>0.60</td>
<td>1.25</td>
<td>3.07</td>
</tr>
<tr>
<td>60 to 80K</td>
<td>0.60</td>
<td>1.35</td>
<td>3.22</td>
</tr>
<tr>
<td>40 to 60K</td>
<td>0.64</td>
<td>1.54</td>
<td>3.05</td>
</tr>
<tr>
<td>20 to 40K</td>
<td>0.67</td>
<td>1.81</td>
<td>3.78</td>
</tr>
<tr>
<td>Under 20K</td>
<td>0.57</td>
<td>1.73</td>
<td>3.49</td>
</tr>
<tr>
<td>Adult ED</td>
<td>0.59</td>
<td>1.38</td>
<td>3.71</td>
</tr>
<tr>
<td>Peds ED</td>
<td>0.66</td>
<td>1.80</td>
<td>3.39</td>
</tr>
</tbody>
</table>
EDBA Staffing Ratio Definitions

- Nurse, tech, clerk and physician hours
  - The number of patients seen on an average day divided by the average number of clinical hours [nurse/tech/clerk/physician] staffed per day
- Physician and APP hours
  - The number of patients seen on an average day divided by the number of clinical hours of physician staffing added to half the number of staffed APP hours

Patient Flow Predictable

- EMS
- General Population use of the ED
  - Total use 445 / 1000 Population
    - 83% Walk-Ins
    - 17% Arrival by EMS
- 80/1000 Population
- Walk-Ins 365/ 1000 Population
- Transfer 2%
- Admit 17%
- Treat & Release 81%
- LBTC 2%
A Summary of Key ED Data Points

- American EDs are seeing about 2.8% more patients per year. This is a long-term trend.
- The average American ED is seeing more than 33,000 patients per year.
- More patients arrive with medical illnesses, rather than injuries.
- More patients are elderly, and arrive by EMS.
- The largest group of patients being seen in the ED have private insurance.
- The highest utilization of Emergency Services occurs among nursing home residents. The next highest utilization is by infants under age 1.
- The CDC report indicates that 5.2% of patients admitted through the ED in 2009 had been discharged from a hospital in the last 7 days. About 4.2% of admitted patients had been seen recently in the same ED.
- There is continued increase in use of EKGs and MRI scans in diagnosing ED patients.
- Payor mix is not changing significantly.

Courtesy of Jim Augustine, MD and EDBA
Emergency Department Operations Management and Patient Flow

An EmCare/Envision Playbook – Best Practices, Tools & Timelines

Envision/EmCare Patient Flow Resources
Staffing an ED Appropriately and Efficiently

- "The ED by its nature is often either overstaffed or understaffed because patient volume is not evenly distributed. Many smaller EDs have as much as a 40% variation between their slowest and busiest days, so peak load crises are inevitable. The real question is how many are tolerable? How far do you bend before you break?"
- "There are two ways of looking at how staffing affects operational efficiency and service. For one, the more efficient your doctors are, the less coverage you need. On the other hand, if you are trying to drive throughput or flow through a system with fixed capacity, such as the ED, and if your space is limited, then you actually need higher staffing levels to drive throughput."
- "If ED beds are a rate-limiting step, which they are for many EDs, then you actually need more staff to drive efficient throughput than you would if you had the beds you needed."
- "What puts you most at risk for medical-legal issues are incidences of misdiagnosis and misadventures in therapy, and the possibility of such incidents is diminished with sufficient coverage."

The Patient Flow Advantage: How Hardwiring Hospital-Wide Flow Drives Competitive Performance

Kirk Jensen/Thom Mayer FireStarter Publishing, January 2015

Section 1 — Framing the Flow Mandate
Chapter 1: Why Flow Matters
Chapter 2: Defining Flow: Establishing the Foundations
Chapter 3: Strategies and Tools to Hardwire Hospital-Wide Flow
Chapter 4: Lessons from Other Industries

Section 2 — Advanced Flow Concepts
Chapter 5: Emergency Department Solutions to Flow: Fundamental Principles
Chapter 6: Advanced Emergency Department Solutions to Flow
Chapter 7: Hospital Systems to Improve Flow
Chapter 8: Hospital Medicine and Flow
Chapter 9: Real-Time Demand and Capacity Management

Section 3 — Frontiers of Flow
Chapter 10: Hardwiring Flow in Critical Care
Chapter 11: Smoothing Surgical Flow
Chapter 12: Acute Care Surgery and Flow
Chapter 13: Integrating Anesthesia Services into the Flow Equation
Chapter 14: The Role of Imaging Services in Expediting Flow
Chapter 15: The Future of Flow
Hardwiring Flow
Systems and Processes for Seamless Patient Care

Thom Mayer, MD, FACEP, FAAP
Kirk Jensen, MD, MBA, FACEP

- Why patient flow helps organizations maximize the “Three Es”: Efficiency, Effectiveness, and Execution
- How to implement a proven methodology for improving patient flow
- Why it’s important to engage physicians in the flow process (and how to do so)
- How to apply the principles of better patient flow to emergency departments, inpatient experiences, and surgical processes

Strauss and Mayer’s
Emergency Department Management

- By Robert W. Strauss MD, Thom A. Mayer, MD
- Kirk B Jensen, MD, MBA, FACEP, Associate Editor
- Publisher: McGraw-Hill Professional
- Publication date: January 2014

- Thom Mayer, one of two chief editors, co-authored 20+ chapters
- Rob Strauss, one of two chief editors, co-authored 20+ chapters
- Kirk Jensen, one of two associate editors, co-authored 11 chapters as well as serving as section editor of the Operations: Flow section.
- Dighton Packard, Section Editor
- Jody Crane, Section editor
- There are multiple other EmCare/envision physicians and people who have co-authored at least a chapter, including Mark Hamm, John Howell, Glenn Druckenbrod and others.
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Improving Patient Flow
In the Emergency Department

Leadership for Smooth Patient Flow:
Improved Outcomes, Improved Service, Improved Bottom Line

Kirk B. Jensen, MD, FACEP
Thom A. Mayer, MD, FACEP, FAAP
Shari J. Welch, MD, FACEP
Carol Haraden, PhD, FACEP

The heart of the book focuses on the practical information and leadership techniques you can use to foster change and remove the barriers to smooth patient flow.

You will learn how to:
- Break down departmental silos and build a multidisciplinary patient flow team
- Use metrics and benchmarking data to evaluate your organization and set goals
- Create and implement a reward system to initiate and sustain good patient flow behaviors
- Improve patient flow through the emergency department—the main point of entry into your organization

The book also explores what healthcare institutions can learn from other service organizations including Disney, Ritz-Carlton, and Starbucks. It discusses how to adapt their successful demand management and customer service techniques to the healthcare environment.

“This book marks a milestone in the ability to explain and explore flow as a central, improvable property of healthcare systems. The authors are masters of both theory and application, and they speak from real experiences bravely met.”

Donald M. Berwick, MD
President and CEO
Institute for Healthcare Improvement (from the foreword)
The Hospital Executive’s Guide to Emergency Department Management

Kirk B. Jensen, MD, FACEP
Daniel G. Kirkpatrick, MHA, FACHE

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Making Healthcare Work Better™ with Lean

Text and Workbook

Authored by: EmCare Clinicians and Operational Experts

Foreword: Kirk Jensen

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- Lean System: Integrating Clinical Departments
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Managing Patient Flow in Hospitals: Strategies and Solutions, Second Edition
The Improvement Guide and Rapid-Cycle Testing

Langley GL, Nolan KM, Nolan TW, Norman CL, Provost LP.


Patient Segmentation by Acuity

ESI 5-Level Triage System:

- Easy
- Highly Reliable
- Allows for quick patient segmentation

Benchmarking Resources

**Where to find data**
Your neighbors
- Call and/or visit
  - ACEP
    - [http://www.acep.org](http://www.acep.org)
  - Premier
    - [www.premier.com](http://www.premier.com)
  - VHA
    - [www.vha.com](http://www.vha.com)
  - ED Benchmarking Alliance
    - [www.edbenchmarking.org](http://www.edbenchmarking.org)
  - UHC
    - [www.uhc.org](http://www.uhc.org)

*Be sure to compare hospitals with similar acuity and similar volume...*

References