Staffing and Scheduling Methodologies

J.D. McCourt, MD, FACEP
Associate Professor/ Vice Chair of Clinical Operations
Department of Emergency Medicine
University of Nevada School of Medicine
Medical Director UMC Adult Emergency Department

Objectives

• Demonstrate several methods available to an ED medical director to assist with staffing and scheduling issues.
• Discuss the staffing models of most efficient emergency departments.
• Explain the best ways to reconfigure staffing models as volume increases.
• List critical points of when another attending is required.
• Explain how staffing affects efficiency, patient and provider satisfaction, cost effective care, and medical-legal safety
ED Staffing

- Qualified emergency care professionals
- All hours of the day
- Regular Staffing / scheduling needs assessment
  - Factors to consider
    - Patient census
    - Acuity
    - Arrival times
    - Availability of support staff
    - Overload/Disaster staffing plan should exists

Best Practice: ED Staffing

- Efficient care
- Patient Satisfaction
- Staff Satisfaction
- Cost-effective Care
- Medical-legal Safety

- 51 Bed ED
- 11 bed FST level 1 Trauma unit
- 72,000 Annual Adult ED/Trauma Volume
- 28% of ED patients are admitted
- 24 EM residents
Just Staff It

• How Many ED Clinicians?
• How many hours of coverage and when?
• What type of provider to schedule?

Basic Data to know

• Number of hours of coverage
• Patient/hr rates of clinicians
• ED Volume
• Patient arrival times to ED
Hours of coverage/Work load

• ED open 24/7
• Open 8760 hours/ Year
• What is a reasonable work load
  – Facility
  – Physicians

• Once Work load is exceeded need to add coverage

Patient/hr rates of clinicians

• 34% surveyed 1.5-2.0 PT/hr
• 30% surveyed 2.0-2.5 PT/hr

• 2.0 Patient per Hour

2010 Emergency Medicine Compensation and Benefit Survey by Daniel Stern and Associates for Physicians in non-academic positions
Demand = Capacity

- 8760 hrs/yr
- 2.05 PT/hr
- 18,000 Pt/year
- Single Physician Coverage
- Need to hire 2 FTE / Shift of coverage
- 4 clinicians.

Demand ≠ Capacity

- Peak load Crisis
  - Elevated patient throughput times
  - Unacceptable LBE rates
  - ↓ Patient satisfaction
  - ↓ Staff satisfaction
  - ↑ Medical-legal risk

ED patient visits are variable in a predictable pattern (Daily and weekly)
Demand ≠ Capacity

Adult ED: average census, # of new arrivals, per hour of day (since 1-1-2010)

# new arrivals

Hour of day

Arrivals

Demand ≠ Capacity

Adult ED: average census by day of week (since 1-1-2010)

Daily census

Day of week
Demand ≠ Capacity

- 64% ED Volume 10a-10pm
- 40% variation ED Volume per Day
- 18k Visit ED/year
- 23K Visit ED/year 10a-10p (2.5-3 PPH)

Consider adding staffing > 2PPH
Demand ≠ Capacity

- Seek to decrease ED Volume?
- Decrease patient acuity?
- Rearrange resources to optimize efficiency?

Consider adding staffing > 2PPH
Demand ≠ Capacity

- Acuity / Admission rate
- Department efficiency
- Provider efficiency
- Non-Physician staffing
- Documentation
- EMR

Common capacity Hurdles

- Triage
- Registration
- Initiation of Diagnostic test
- No where to place patient
Must Match Resources to demand

Waiting Time (minutes)

Utilization as Percent

200
180
160
140
120
100
80
60
40
20
0
70  75  80  85  90  95  100

Improve capacity

Decreased Wait times

Copyright Jody Crane, MD, MBA, Chuck Noon, PhD 2008

Need to first match capacity (resources) to Demand

• Front end interventions (Input )
• Practice interventions
• Back end interventions (Output)
Emergency Department Volume

Average annual volume change: 4.2%
No Increase in Staff

No Increase in Staff
Team Triage

- Minimal increase in staffing
- Decreases LBE: 1.4%-3%
- Decrease ED LOS: 26-36 minutes
- ED Census increase 9%-16%

Designing ED Provider Schedule

• Goal:
  – Match Staffing levels to demand levels
  – Decrease delays to service
  – Provider satisfaction

Designing ED Provider Schedule

• Challenges:
  – Variable demand levels
  – Variable provider treatment rates
  – Capacity capabilities
  – Staffing level constraints
    ✓ Predetermined shift length
    ✓ Provider preference
Variable Demand in Predictable Pattern

Queuing Theory / Software

- Variable demand / predictable rate
- Variable provider treatment rates
- Capacity capabilities
- Magnitude of delay is nonlinear function of variables
Your Kidding?

Your Kidding?

Copyright Jody Crane, MD, MBA, Chuck Noon, PhD 2008

Inputs

Your Kidding?

Copyright Jody Crane, MD, MBA, Chuck Noon, PhD 2008
• Prior to implementation
  – Staffing levels/shift schedules identical 7 days/ wk
  – 55 provider hours / day
• After implementation
  – Entire staffing schedule rebuilt
  – 56.7 provider hours/day
• Volume increased 6.3%
• LWBS decreased from 9.2% -7.2%

ED Provider Schedule Design: Basics

• Max 3 arrivals/provide (range 2.0 – 3 pt/hr)
• Nurse staffing
  – 1 RN/4-5 pts
  – Staggered to Physician schedule

ED Provider Schedule Design: Basics

• Most efficient staff model
  – Add new provider Q3 – 4hrs
  – Anticipate surges
  – New provider 1 hr after surges (predictable)
ED Provider Schedule Design: Basics

- Shift overlap crucial
  - Patient/clinician satisfaction
  - Decreased sign outs
  - Improves effectiveness
  - No > then 1 hr overlap

- Other strategies
  - Flex shift
  - On call physician


What type of provider should be scheduled?
Factors that affect this decision

- Overhead costs
- ED location
- Hospital rules and regulations

Types of providers used for staffing

- BC/ board eligible EM Physicians
- FP/IM with EM experience
- Midlevel providers (MLP)
  - Physician assistants (PA-C)
  - Nurse practitioners (NP)
Economics of adding staff

- MLP Billing
  - Service billed 85% (independently)
  - Service billed 100% (EP supervision)

### 2009 Medicare Physician Fee Schedule

<table>
<thead>
<tr>
<th>CPT Code</th>
<th>Description</th>
<th>Year 2009 RVUs</th>
<th>Year 2009 CMS Payment</th>
<th>Percent Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>99281</td>
<td>ED visit level I</td>
<td>0.56</td>
<td>$20.20</td>
<td>4%</td>
</tr>
<tr>
<td>99282</td>
<td>ED visit level II</td>
<td>1.09</td>
<td>$39.31</td>
<td>8%</td>
</tr>
<tr>
<td>99283</td>
<td>ED visit level III</td>
<td>1.70</td>
<td>$61.31</td>
<td>4%</td>
</tr>
<tr>
<td>99284</td>
<td>ED visit level IV</td>
<td>3.17</td>
<td>$114.33</td>
<td>5%</td>
</tr>
<tr>
<td>99285</td>
<td>ED visit level V</td>
<td>4.72</td>
<td>$170.23</td>
<td>5%</td>
</tr>
<tr>
<td>99291</td>
<td>Critical Care 1st hr.</td>
<td>5.88</td>
<td>$212.07</td>
<td>4%</td>
</tr>
</tbody>
</table>

Medicare Reimburses $36 /RVU
### Staffing Cost: Analysis

<table>
<thead>
<tr>
<th>Clinician</th>
<th>RVUs/patient</th>
<th>Patients/hr</th>
<th>RVU/hr</th>
<th>$/RVU cost</th>
<th>Collected/HR</th>
<th>Margin</th>
</tr>
</thead>
<tbody>
<tr>
<td>EP A</td>
<td>4.25</td>
<td>2.0</td>
<td>8.5</td>
<td>$14</td>
<td>$187/hr</td>
<td>$67/hr</td>
</tr>
<tr>
<td>EP B</td>
<td>3.5</td>
<td>2.0</td>
<td>7.0</td>
<td>$17</td>
<td>$154/hr</td>
<td>$34/hr</td>
</tr>
<tr>
<td>FP/IM</td>
<td>3.0</td>
<td>2.0</td>
<td>6.0</td>
<td>$15</td>
<td>$132/hr</td>
<td>$28/hr</td>
</tr>
<tr>
<td>MLP*</td>
<td>2.75</td>
<td>2.0</td>
<td>5.5</td>
<td>$11</td>
<td>$102.8/hr</td>
<td>$37/hr</td>
</tr>
<tr>
<td>MLP** Fast-track</td>
<td>2.0</td>
<td>3.0</td>
<td>6.0</td>
<td>$10</td>
<td>$112/hr</td>
<td>$47/hr</td>
</tr>
</tbody>
</table>

- Site Collecting $22/RVU (variable based on Payer mix)
- *MLP collecting 85%: $18.7/RVU
- EP Hourly Compensation: $120/hr
- FP/IM Hourly Compensation: $90/hr
- MLP Hourly Compensation: $65/hr

### Adding Staff

- As volume increases add staffing
- Most cost effective first
- This is done before volume demands adding a EM physician
- 25-35% of volume can be seen by MLP (Most cost effective)
- MLP / EM physician should not > 1:1
- 75% of volume can be seen by FP/IM
MLP rank status in EM

• Dependent practitioners
• Physician oversight required
• Do not take the place of EM physicians
• Not a substitute for BCEM EP experience and training

Liability Increased without:

• Training
• Supervision
• Policy/procedures
Physician Assistant 101

• Training: 2 years course work/clinical
• National Commission on Certification of Physician Assistants (NCCPA)
  – Certification exam
  – Title PA-C last for 6 years
  – Maintain 100 hrs CME/ 2 years
  – Pass recert exam

Physician Assistant 101

• State regulations: Variable
  – Regulatory boards vary
  – Certification vs. License
  – Max # of PA under 1 physician (2-3)
  – All states require physician supervision
  – No state allows independent PA practice
Forms of MLP Supervision

- Direct
- On-site
- Off-site: Can be difficult to separate from independent practice

Rural ED Staffing

- Telephone survey
- Rural hospitals < 100 beds
- 96% response rate
- 14% use PA/NP with physician on call!!
- Uncommon training
  - ATLS
  - PALS

ACEP: Guidelines on the role of PA and NP in the ED

- EP must be aware of
  - MLP scope of practice
  - Supervision requirements
- Specific EM training/experience
- Supervised orientation
- On going EM CME and training
- Clear delineation
  - Practice scope:
  - Level of supervision

ED Scheduling
Physician Wellness

Dangers of rotating shift work

• Possible relation to cardiovascular disease?
• Increased risk of stroke?
• Driving drowsy!
  –increased risk of motor vehicle crashes
Driving Drowsy

- Comparison of simulation performance
- 22 Residents post call
- ↑ Lane variance
- ↑ Crashes

Ware J.C., et al: Medical resident driving simulator performance following a night on call. Behav Sleep Med 4. 1-12.2006;

Emergency Physician shift work

- Circadian principle
- Avoid long stretch of shifts
- Regular periods off
- Rotating clock wise
- Night shift worker
  - Anchor sleep
  - Day time duties minimum
  - Incentives: Shift differential/Make your own schedule
  - Place to sleep prior to drive home

ED scheduling Software vs. Human

- Compile stats
- Error checks
- Template setup
- Communication
- Actual Schedule creation
Key components of ED Scheduling software

- WEB Based
- Automated schedule creation
- Multiple facility support
- Time and Cost accounting
- Real time schedule changes
- Communication (Email / Text)
- Personal clinician access
- Schedules compatible other calendars
Login

Email Address

Password

Continue

Forgot your Password?
Click Here

Choose Area

Please select one of the below Areas to enter

Adult ED

Outpatient Care

ED Residents
Overhead cost of ED Scheduling

- Cost of scheduling software:
  - $7.14/clinician/ month (spread over total contract group)

- Cost of clinician scheduler
  - Monthly stipend: $1K-2K/ month

- UMC Cost example
  - 42 clinicians
  - 13 shifts/day
  - Total Annual cost $266/clinician
### Request Form

**January 2012**

<table>
<thead>
<tr>
<th># of Days Requested</th>
<th># of Days Spanning the Month</th>
<th>Days of the Month Available</th>
<th>Days of the Month Not Available</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>18</td>
<td>1-31</td>
<td>1-31</td>
</tr>
</tbody>
</table>

**Special Requests:** If you will only be available for a specific shift(s) on an available day, please select AVAILABLE with(s) below.

- **SA 3P**
- **SA 3P n**
- **SA 4P**
- **SA 4P n**
- **2P**
- **2P n**

**Shift Overlaps (0)**

**November 2011**

<table>
<thead>
<tr>
<th>N</th>
<th>Date</th>
<th>Shift</th>
<th>Time In</th>
<th>Time Out</th>
<th>Day</th>
<th>Swing</th>
<th>Night</th>
<th>Bonus</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>03</td>
<td>03</td>
<td>2P</td>
<td>9:00</td>
<td>9:00</td>
<td>7</td>
<td>7:00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>04</td>
<td></td>
<td>2P</td>
<td>9:00</td>
<td>9:00</td>
<td>7</td>
<td>7:00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>05</td>
<td></td>
<td>2P</td>
<td>9:00</td>
<td>9:00</td>
<td>7</td>
<td>7:00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>06</td>
<td></td>
<td>2P</td>
<td>9:00</td>
<td>9:00</td>
<td>7</td>
<td>7:00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>07</td>
<td></td>
<td>2P</td>
<td>9:00</td>
<td>9:00</td>
<td>7</td>
<td>7:00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>08</td>
<td></td>
<td>2P</td>
<td>9:00</td>
<td>9:00</td>
<td>7</td>
<td>7:00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>09</td>
<td></td>
<td>2P</td>
<td>9:00</td>
<td>9:00</td>
<td>7</td>
<td>7:00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td></td>
<td>2P</td>
<td>9:00</td>
<td>9:00</td>
<td>7</td>
<td>7:00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td></td>
<td>2P</td>
<td>9:00</td>
<td>9:00</td>
<td>7</td>
<td>7:00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td></td>
<td>2P</td>
<td>9:00</td>
<td>9:00</td>
<td>7</td>
<td>7:00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td></td>
<td>2P</td>
<td>9:00</td>
<td>9:00</td>
<td>7</td>
<td>7:00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td></td>
<td>2P</td>
<td>9:00</td>
<td>9:00</td>
<td>7</td>
<td>7:00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td></td>
<td>2P</td>
<td>9:00</td>
<td>9:00</td>
<td>7</td>
<td>7:00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16</td>
<td></td>
<td>2P</td>
<td>9:00</td>
<td>9:00</td>
<td>7</td>
<td>7:00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17</td>
<td></td>
<td>2P</td>
<td>9:00</td>
<td>9:00</td>
<td>7</td>
<td>7:00</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Subtotals:**
- Day/Swing/Night Totals: 79.00 0.00 21.00
- Total Hours Worked: 100.00

**Add / Split a Shift for November 2011**

<table>
<thead>
<tr>
<th>N</th>
<th>Date</th>
<th>Shift</th>
<th>Time In</th>
<th>Time Out</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
<td>03</td>
<td>2P</td>
<td>9:00</td>
<td>9:00</td>
<td></td>
</tr>
</tbody>
</table>
Shift Length

- Longer shift length: 12 hours
  - Productivity decreases
  - Poor decision making
  - Increased error rate
- Shorter shift length: 8 hours
  - Better clinician efficiency
  - Frequent provider turnover
Shift Length

• Recommendations
• Balance productivity to shift load
• 12-18 shifts/month is a common range.
• Consider compromise: Group decision
  – 9 or 10 hour
  – Mixture of shift lengths
  – 12 hour weekends
  – 8 hour weekdays

Shift Distribution

• Shift Distribution strategies
  – 20% night shifts/month reasonable goal
  – Weekends: 4 weekend shifts/month
  – Try to use part-time staff as supplement
  – Shift differential (20%)
Emergency Shift Coverage

- Common situations
  - Family emergency
  - Medical condition
  - Medical staff suspension
  - Volcanic eruption!

- $ Standardized call in bonus: $500-$1000
- Emergency schedule template

<table>
<thead>
<tr>
<th>Shift #</th>
<th>Emergency Shifts</th>
<th>Emergency Physician</th>
<th>ED Cell Phone #</th>
</tr>
</thead>
<tbody>
<tr>
<td>1(W)</td>
<td>6a-6p*</td>
<td>McCourt</td>
<td></td>
</tr>
<tr>
<td>2(E)</td>
<td>6a-3p</td>
<td>Meade</td>
<td></td>
</tr>
<tr>
<td>3(RMA)</td>
<td>10a-10p</td>
<td>Guillermo</td>
<td></td>
</tr>
<tr>
<td>4(W/RMA)</td>
<td>6p-3a*</td>
<td>Kroll</td>
<td></td>
</tr>
<tr>
<td>5(E)</td>
<td>2p-11p</td>
<td>Berkeley</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>10p-7a</td>
<td>Sadeghi</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>10p-7a*</td>
<td>Daird</td>
<td></td>
</tr>
<tr>
<td>TR am*</td>
<td>7a-7p</td>
<td>Hughes</td>
<td></td>
</tr>
<tr>
<td>TR pm*</td>
<td>7p-7a</td>
<td>Malone</td>
<td></td>
</tr>
</tbody>
</table>

*Change Physician
Emergency Shift Coverage

• Technology recommended
  – Group texting
  – Group Emailing
  – Web based schedule system

• Total coverage: 104hrs
• 76hr EP/day
• 28 hrs MLP/Day
• 13 total shifts
• 24 EM residents
• Daily Volume 205
• LBE 4%
References


