Overview of Emergency Department Function at a University Hospital in Boston

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Challenge of Emergency Care Delivery

- Healthcare systems and hospitals are complex
  - Advanced specialty care
  - Hospitals with specialty “silos”
  - Difficult to navigate
- Many patients with acute problems
  - Some need help quickly; others can wait
  - Emergencies are time-sensitive
  - Majority come with unclear diagnosis

- Emergency Care System needs to quickly and accurately:
  - Identify, prioritize patients in need of urgent evaluation, treatment
  - Stabilize, provide timely care
  - Determine definitive care needs, rule out life-, limb-threats,
Sources of Hospital Admissions
United States (2005)

Emergency Department Role in Hospital Based Emergency Care Delivery

**Simplify access for all acute patients:**

- **Single portal of entry to hospital**
  - Specialty trained emergency physicians, nurses
  - Standardized triage protocols
- **Immediate access to life-saving interventions**
  - Provide time-sensitive treatments
- **Targeted diagnostic evaluations**
  - Determine definitive care needs, admitting diagnosis
  - Majority of patients can be discharged from ED
  - Avoid unnecessary hospital admissions
Cost of Emergency Department Care
United States (2005)

- Emergency Department Services: 3.3%
- Home Health Services
- Dental Services
- Hospital Outpatient Services
- Prescription Medications
- Office Based Medical Provider Services
- Hospital Inpatient Services

Beth Israel Deaconess Medical Center
600 inpatient beds:
- 69 Adult critical care unit
- 36 neonatal intensive care
- 360 Med/Surg
- 60 OB/Gyn
- 65 Newborn nursery
- 23 inpatient psychiatry

Total annual hospital discharges: 38,600 (FY2005)

40% of inpatient admissions come through Emergency Department
Inpatient Specialty Services:
- Internal Medicine
- Cardiology
- Neurology
- Psychiatry
- Oncology
- Orthopedics
- Neurosurgery
- Vascular Surgery
- Newborn/neonatal
- No Pediatrics

1200 senior physicians on active medical staff

Graduate Medical Education:
- Anesthesiology
- Critical Care
- Dermatology
- Emergency Medicine
- Internal Medicine / Primary Care
- Neurology
- Neonatology
- Obstetrics / Gynecology
- Pathology
- Radiology
- Radiation Oncology
- Surgery

650 physicians-in-training (residents & fellows)
BIDMC West Campus Clinical Center

Wish list:
- Cardiac cath lab
- OB/GYN
Patient Flow through the ED

Emergency Department

- Triage "1-5"
- Wait Room
- Trauma/Resusc
- Acute
- Non-acute
- Observation

- 1-5
- 2-3
- 3-5

- Hospital
- Intermediate care facilities
- Home
Emergency Department Floor Plan

- Observation Unit
- Waiting Area
- Reception
- Triage
- Acute Area
- Non-Acute
- Fast Track
- Psychiatric
- Trauma Resuscitation Bays
- Emergency Radiology
- Elevators
- Main ED Patient Entrance
- Ambulance Parking
- Decontamination Room
Key Facility Design Issues

• Segregate patients by **acuity** instead of “specialty”
• Universal room configurations = flexibility
• Special room configurations
  – Trauma / resuscitation, Observation, Psychiatry, ENT, Ophthalmology, Pediatrics
• Proximity to key inpatient services in hospital
Combined ED staffing vs. Patients in Department 8/05 – 8/06
Annual ED Patient Volume = 55,000
Phases of ED Patient Management

- Triage*
- Resuscitation
- Stabilization*
- Diagnostic Evaluation
- Consultation
- Therapeutic Intervention
- Observation
- Disposition
Emergency Department Triage

- Which patients need to be seen first?
- Which patients can wait to be seen later?
- Nursing role
  - Experienced nurses
  - Specific training
  - Quality control


Emergency Department Triage


Emergency Medicine Physician

- Responsible for all patient care in Emergency Department
  - Resuscitation / stabilization
  - Initial diagnostic evaluations, treatment
  - Observation
  - Admit (or transfer) to appropriate inpatient service
- EM is a primary medical specialty
  - Acute generalist
  - Resuscitation
- Supervise all patient care by physicians-in-training
- Coordinate consultations and definitive care by other specialists
BIDMC Emergency Department Physician Staffing

• Specialty trained EM (Attending) physicians present in ED 24 hrs per day
  – 35 attending physician group
  – 1 – 3 on duty at a time
  – Involved in care of all ED patients

• Physicians Trainees (Residents)
  – 36 EM Residents (3 year program)
  – 3 - 7 on duty at a time
  – 60% Emergency Medicine; 40% Other Specialties (Internal Medicine, Surgery, OB/GYN, Pediatric EM)
  – All patients seen by Resident require Attending supervision
Emergency Department Nursing

- ED based practice
- Broad knowledge, skill set
- Patient assessment
- Triage role
- Procedural skills
- Critical care duties
ED patients seen by a specialty consultant in the ED

Other Specialties’ Role in the ED

Involved with patient care in ED:
- Consultation on patients
- Procedures or interventions outside scope of ED physician
- Facilitate admission to service

Involved with development ED guidelines:
- Clinical pathways
- Specialty consultation guidelines
- Multi-disciplinary teams

Top 5 specialty consults on ED patients at BIDMC:
1. Neurology – 23.7%
2. Psychiatry – 17.4%
3. General surgery – 15.1%
4. Orthopedics – 11.8%
5. Cardiology – 10.5%
Emergency physicians enhance productivity of other specialists

- EM physicians manage majority of cases that don’t require specialist involvement
- Serve as a “buffer” for inpatient specialists
- Consultant specialists spend more time in their home departments:
  - Work they are trained to do
  - Can be on call from home
  - Available to work the following day in ambulatory clinics, etc.
Gør det du er bedst til

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Selected diagnostic services provided in the ED
United States (2005)

- ED physician determines the patient’s initial diagnostic evaluation
- Focused diagnostic evaluations
  - Rule out potential life threats
  - Determine need for admission
  - Identify easily treatable problems

Total ED visits: $N = 115,323,000$

Selected procedures performed in the ED
United States (2005)

• ED physicians / nurses perform wide array of procedures
  – Resuscitation, stabilization
  – Treatment of major, minor problems

• Frequently performed procedures:
  – Wound care – 10.3%
  – Orthopedic care – 5.6%
  – Endotracheal intubation – 0.3%
  – CPR – 0.1%

A Comparison of Trauma Intubations Managed by Anesthesiologists and Emergency Physicians

Joseph S. Bushra, MD, Bryon McNeil, MD, David A. Wald, DO, Ari Schwell, MD, David J. Karras, MD

- Prospective, observational study of consecutive trauma intubations in a single ED
- All airways managed by anesthesiology during first phase of study; by emergency medicine during second phase
- Total intubations = 673

- Intubation successful within 2 attempts:
  - by Anesthesia in 94.6% of cases;
  - by Emergency Medicine in 95.2% of cases

- Intubation failure:
  - by Anesthesia in 3.4% of cases;
  - by Emergency Medicine in 1.9% of cases

Conclusions: Emergency physicians can safely manage the airways of trauma patients. Success and failure rates are similar to those of anesthesiologists.
Use of protocols and patient care guidelines

Example: Multi-disciplinary guideline for evaluation of non-traumatic neck/back pain

- Cluster of cases with delayed diagnosis of epidural abscess (2006)
- Emergency medicine, neurology, neurosurgery, orthopedic surgery, internal medicine, neuro-radiology
- Lecture series to EM residents and nurses;
- on-line teaching module and test
- No delayed diagnoses since implementation
Use of Multi-Disciplinary Teams

- STEMI, stroke, sepsis, trauma
- Defined team members with specific roles
- Diagnostic and treatment protocols
- Tracking of time intervals:
  - Response time of team members outside ED
  - Time to key diagnostics
  - Time to key interventions
  - Time to patient leaving ED

Code STEMI Protocol
ED Observation at BIDMC

Decrease unnecessary admissions:
- Short courses of therapy
- Extended diagnostic evaluations

Top 5 diagnoses:
- Chest pain
- Cellulitis
- Asthma / COPD
- Dehydration
- Psychiatric

Observation Criteria:
- Simple problems
- Clear diagnosis and management plan
- No complex medical decision making
- > 85% likelihood for discharge within 24 hours
- Minimal nursing care requirements
Emergency Care Quality Assurance at BIDMC

“Quality needs to be defined and measured in order to be improved”

- **BIDMC ED Dashboard**
  - Patient data tracking system
  - Workflow management
  - Medical decision making support

- **Electronic data from multiple sources**
  - Clinical data
  - Registration data
  - Timestamp data

- **“Airplane in-flight data recorder”**
  - Patient care timeline

- **Automate administrative tasks:**
  - Reporting of process, outcome measures
  - Screening of cases for review manually
Examples of General Quality Markers:

Time motion intervals
- Waiting time to be seen
- Time to disposition
- Total length of stay
- Response times for specialist consultants
- Turn around time for laboratory studies

Screening markers
- 72 hour return to ED with hospital admission (3%)
- 24 hour floor to ICU transfer after ED admit (0.5%)
Disease Specific Markers:

- Acute coronary syndromes
  - Patients receiving appropriate initial therapy (ASA, beta-blockers)
  - EKG in acute coronary syndrome

- Pneumonia
  - Patients receive blood cultures prior to receiving first antibiotic
  - Antibiotics received within 4 hours of hospital arrival
Summary

• The right care for the right patients within the right time frame
• Reduce morbidity, mortality and disability
• Simpler is better
  – Single portal of entry
  – Single specialty
  – Evidence-based guidelines, protocols
• Define and measure quality