Clinical Pharmacy Services in the Emergency Department

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History of Emergency Pharmacy Services

- 1970's[1]
- Billing
- Inventory control
- Clinical pharmacy services
- 1980's led way for pharmaceutical care

1 Ellenbaas, et all

ED is a Unique Practice

- Many safety mechanisms not available in ED
- Pharmacy USUALLY not present
  - NO DOUBLE CHECK
- JCAHO supports pharmacist double check on ALL medication orders

Unique Practice cont.

- High Patient Volume
- Verbal Orders
- HIGH STRESS situations

Reasons for Chaos

- One time orders
- Little patient history
- No other safety mechanism in place
- Changing gears
- Inpatients/outpatients co-mingling
- 4 times as many ED visits as OR in US!

Medication Errors in the ED

- ED has highest rate of preventable errors
- 110 MILLION ED patients yearly in US*
- 5% experience potential events
  - 70% of these are PREVENTABLE

*National Center for Health Statistics.

Let's Compare

- 77% of all ED medication errors between ordering phase and administration phase
- 23% of errors were discovered before patient received medication
- 39% in other area of hospital

IOM Report

- *Hospital-Based Emergency Care: At the Breaking Point*
  - Emergency Department (ED) crowding:
    - Over past decade, ED visits increased 26%.
    - The number of EDs declined 9% and hospitals closed 198,000 beds.
  - Ambulance diversion: When crowding reaches dangerous levels, ERs divert inbound ambulances..

IOM Report

- Uncompensated care: Everyone is legally entitled to emergency care, however no funding is provided This results in the inevitable closing of many ERs and trauma centers.

- Fewer "on-call" specialists: The rising costs of uncompensated care and fear of legal liability have led more specialists to opt out of taking ER call.

- Inadequate emergency preparedness: If ERs and trauma centers are already jammed with patients, how could they respond to a disaster or a terrorist strike?

IOM Report

- EDs not well equipped to manage pediatric care
  - Pediatrics make up 27% of ED visits
  - 6% of EDs prepared for pediatrics

Strong Memorial Hospital

- ED has > 120 beds
- Over 500 doses of medication dispensed per day
- Over 90,000 patient visits per year
  - 60,000 adults
  - 30,000 pediatrics
- Nationally ~ 3.5% of ED's have Pharm presence

Challenges to Implementation

- Financial
- Staffing
- Acceptance by medical staff / turf issues
  - Physicians, nursing, midlevel providers, etc
- Physical space within ED
- Training

Pharmacist Duties in the Emergency Department

- Clinical
- Academic
- Research
- Administrative
- Distribution
- Emergency preparedness

Clinical Duties

- Clinical Consultation
  - Attend rounds and present patient information
  - Dose recommendations
  - Therapeutic substitution
  - Disease state specific pharmacotherapy
  - Pharmacokinetics
  - Being available – and visible!!

Clinical Duties

- Medication history
- Allergy screening
- Pregnancy medication consultation
- Weight based dosing
  - Pediatric
  - Obese
  - Geriatric
  - Disease specific (CF, FTT, etc)

Clinical Duties

- Patient Education
  - Medication specific education
    - Asthma
    - Warfarin
    - LMWH
    - Diabetes
  - Discharge counseling

Adherence to Guidelines

- JCAHO Performance Measures
  - PNA
  - MI
  - CHF
- Goal Directed Therapy

ED is an Acute / Ambulatory Environment

- Pharmacist expertise with medication selection
- Educate patient of diagnosis and medications
- Assist with medication related ED visits

Discharge Counseling

- Compliance
- Smoking cessation
- OTC products
- Available for patient consultation

Order Review

- Allergies
- Medication interactions
- Inappropriate
  - Dose
  - Route
  - Indication

ED is only place within SMH that has handwritten orders

Preparation of Medications

- Trauma Response
- Cardiac Resuscitations
- RSI
- Stroke Response
- MI Team Response

Contributing Factors to Hazards

- Patients are strangers
- Multiple patients being treated at same time
- Wide range of medications utilized
- Interruptions/distractions
- ED Dispensing
- Time Constraints
- Tight Coupling

Croskerry, et.al. Academic Emergency Medicine

Teamwork!

- Lack of teamwork in ED shown to be direct contribution leading to ADR's

The Medication Process

- Prescribing
- Transcribing
- Dispensing
- Administering
- Monitoring
- Discharge Medications

Prescribing

- Incomplete knowledge of medication
- Incomplete knowledge of patient
- Less access to
  - Patient medications prior to visit
  - Patient history

Transcribing

- Verbal Orders
- Poor penmanship
- Team communication errors

Dispensing

- Dispensed by nursing
- Dispensed by physicians
- Thorough counseling not available/performed

Administration of Medications

- Multiplicity of medications
  - Therapeutic duplications
- Potency of medications
- Multiple patients in the ED
- Parenteral administration
- Drug incompatibilities
- Physician administration

Monitoring

- Parenteral administration
  - Esp cardiac medications, insulin, etc...
- Emergency procedures
- Inadequate personnel

Discharge Medications

- Complex procedures
- Medicated patients leaving the ED

Chart Review

- Review all patient charts for appropriate medication use
  - Underutilization
  - Overutilization
  - Polypharmacy

Medication + Elderly

- Beer's criteria
- Criteria for inappropriate medication use
  - developed by expert panel
  - more about chronic use, but somewhat applicable

Medications + Elderly

- Benzodiazapines
- NSAIDS
- Anticholinergics
- Muscle Relaxants
- Propoxyphene
- Pseudoephedrine
- DRUG INTERACTIONS

Multi-Levels of Patient Care

- ICU (surgical, trauma, medical, etc)
- Ambulatory
- Medicine
- Heme-Onc
- Transplant
- ID
- Pediatrics

Nursing must be well versed in all aspects

Patient Transfer

- Sign off complex patients to other pharmacy specialists within institution
  - Transplant
  - Cardiac
  - Psych
  - ID
  - Pediatrics

Boarded Patients

- When patients are admitted to the hospital, but there are no beds available
- ED as an inpatient unit
- JCAHO mandates same level of care as floor patients
- IOM Report

Distribution

- Automated dispensing machines
- CPOE for admitted patients
  - Pharmacy System
  - PYXIS
- Pharmacist available for assistance

Emergency Preparedness

- ChemPack management
- Education
- Distribution

ChemPacks

Emergency Preparedness

- Local
  - Institutional
- County
  - Educational + training
- State
  - Distributive + educational
- National

Research Opportunities

- Clinical research
  - Assist with medical/clinical research
- Practice research
- Research committees

Educational Opportunities

- Resident Education
  - Rotation available for MD and PharmD
    - Pharmacokinetics
    - Antimicrobial management
    - Drug interactions
    - Cardiac Medications
    - Code Situations
    - ACLS, ATLS, AHLS, ABLS etc...

Educational Opportunities

- Nursing Education
  - Changes to formulary
  - Drug-drug interactions
  - Administration techniques/infusion rates
  - Medication compatibilities
  - Safe medication delivery

Educational Opportunities

- Pharmacy staff education
- Pharmacy student education
- High school students

Administrative Duties

- Committee Participation
- Medication Use Evaluations
- Protocol Design
- Quality Improvement

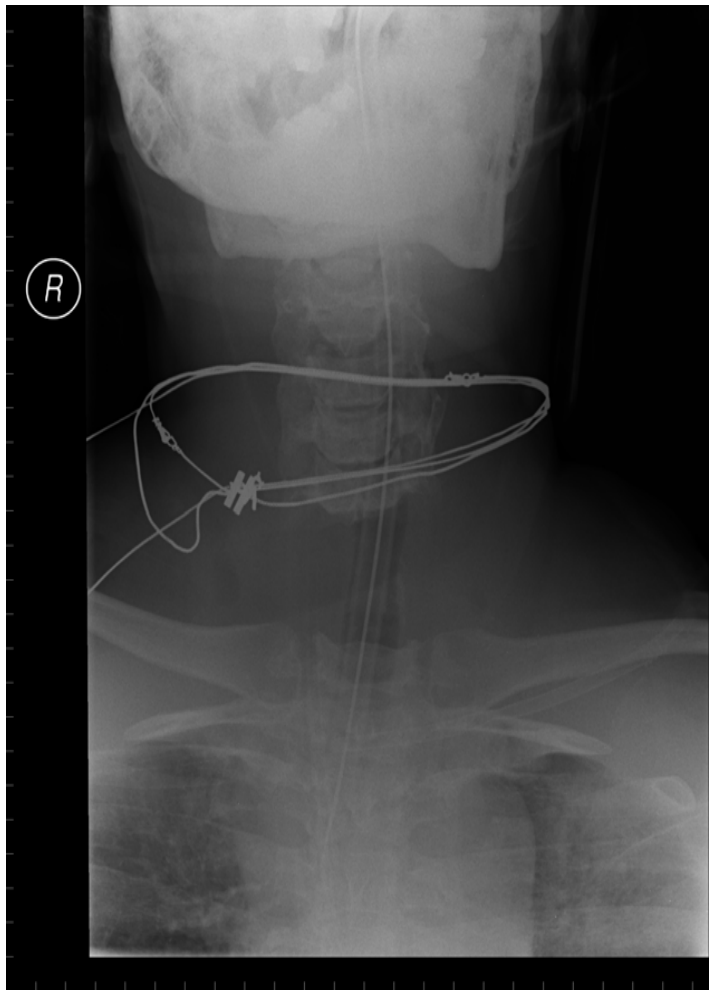
JCAHO

- Order review
- PYXIS profile
- Pay for performance
- Medication management standards
- Medication reconciliation

Medication Reconciliation

- JCAHO 2005 National patient safety goal
- Joint venture between all health care professionals
- Will provide COMPLETE medication information across continuum of care
- Responsible for forwarding medication profile to next level of care

How are pharmacists prepared for this?



Training Pharmacists for Emergency Medicine

- Level of training expected?
  - PharmD rotations?
  - Mentoring?
  - Residency?
- Training opportunities available
  - ACLS, ATLS, etc...
- Expectations from Emergency staff

Resident Opportunities

- Resident Education
  - PGY1
  - PGY2
    - Detroit Receiving*
    - Strong Memorial*
    - Rutgers

* Currently accredited by ASHP

Public Awareness

- ASHP / ACCP involvement
- National EM/CC society involvement
- Publications
- AHRQ Grant

Questions?

www.EmergencyPharmacist.org

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