Iatrogenesis

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Iatrogenesis

- Iatrogenesis refers to any unintended and untoward consequence of well-intended healthcare interventions.
- Cascade iatrogenesis is a series of adverse events triggered by an initial medical or nursing intervention initiating a cascade of decline.
  - Occurs most frequently among the oldest, most functionally impaired patients and those with a higher severity of illness upon admission.
Iatrogenesis

- Iatrogenesis is a very common, often preventable, hazard of hospitalization and is associated with significantly longer hospital stays, increased patient mortality and cost.
Iatrogenesis

- Although we have a better understanding of iatrogenesis there has not been much progress in decreasing this phenomenon
- Most likely the tip of the iceberg
Governmental regulations were initiated in the late 1960's after a pandemic of staphylococcal infections in U.S. hospitals and the thalidomide disaster.
The Institute of Medicine (1999) cites extremely high rates of iatrogenesis in hospitalized patients as a result of medical error and negligence that largely resulted from system failures.

The IOM urged immediate, vast and comprehensive system wide changes, including both voluntary and mandatory reporting programs by healthcare organizations.
History

- In 2000, a Presidential task force identified a "national problem of epidemic proportions" citing errors made by medical practitioners.
- The errors caused between 44,000 and 98,000 deaths per year at a cost of up to $29 billion in unnecessary healthcare costs, disability and lost income.
History

- Major three year study on "Patient Safety in American Hospitals" (released in July 2004) provides compelling evidence that 195,000 Medicare patients die every year in hospitals as a result of medical error at a cost of $2.85 billion annually.
- Medical errors would be ranked as the sixth leading cause of death in the United States if it were a recognized cause of death by the CDC in its Annual Vital Statistics Report.
Prevalence of Iatrogenesis

- Hospital admissions: Up to 13%
  - Majority due to adverse drug events
  - 70% are considered preventable
- Once hospitalized, two to 36% of patients experience iatrogenic complications
  - 50% considered preventable
  - ICU patients have highest rate of iatrogenic complications, with 6.5% associated with permanent disability and 3.7-14% mortality rate.
Prevalence

Patients 65 years and older
- Have twice as many diagnostic complications
- Two and one half times as many medication reactions
- Four times as many therapeutic mishaps, and
- Nine times as many falls as those younger patients.
The most common iatrogenic event results from:
- Adverse reactions to medications
  - Account for approximately 15% of hospital admissions in patients > 65 as compared to 6% for younger patients
  - Common causes include inappropriate drug prescribing, errors in prescription, transcription, administration and complicated medication dosing schedules
Healthcare practitioners need to be trained to:

- Use knowledge of medication pharmacokinetics and pharmacodynamics to alter prescribing and administering practice.

- Recognize an adverse drug event and be able to differentiate it from a new illness, so that another medication is not inappropriately prescribed to treat a "new" illness or symptom.
Prevention Strategies

- Regular review of all medications including over-the-counter drugs and those prescribed by multiple providers.
- Engage in judicious prescribing practices:
  - "Start low and go slow", titrating drug dosages upwards to effect.
  - Discontinue a medication as soon as possible and consider drug holidays in older patients.
Prevention Strategies

- Chose medications that can treat more than one symptom whenever possible:
  - Calcium channel blockers for patients with both hypertension and angina.
  - Angiotensin-converting enzyme inhibitors can be used to treat both for those with hypertension and congestive heart failure.
Prevention Strategies

- Aggressively address patient adherence to the extent possible:
  - Minimize the number of drugs.
  - Simplify the regimen.
  - Provide written and effective patient education.
  - Recognize and compensate for mild cognitive deficits, depression, limited educational or developmental level.
Prevention Strategies

- Utilize written medication schedules, and devices such as a medi-set or simple routines such as daily telephone reminders by family members.

- Address access issues including cost, transportation, pharmacy's ability to stock a drug (especially narcotic analgesics), inability to open bottles, and cultural beliefs.
Prevention of Iatrogenesis

- Try non-pharmacologic protocols to address problems such as dementia, delirium, anxiety, incontinence and sleep problems to decrease the current reliance on drug therapy.

- Teaching patients, families and caregivers medication use and adverse events to watch for
Adverse Effects of Diagnostic, Therapeutic and Prophylactic Procedures

- Diagnostic tests and procedures involve some degree of risk
  - Invasive procedures
  - Use of Contrast dye
  - Radiation
Medical procedures are linked to significantly more preventable adverse effects.

- Thoracentesis is linked to cardiac arrhythmias, bleeding, infection and pneumothorax in the older adult.
- Colonic perforations occur due to endoscopy.
- Urinary tract infections result from the use of an indwelling bladder catheter.
- Over administration of intravenous fluids in an older patient with age-related reduced cardiac reserve can cause congestive heart failure.
Adverse Effects of Diagnostic, Therapeutic and Prophylactic Procedures

- Surgical complications in patients over 65 years occur at a rate twice that of younger patients.
- The rates of postoperative complications and death tend to increase with age.
  - Atypical presentation of disease accounts for a high number of emergent and therefore far more risky surgeries in the older patient.
  - Geriatric patients account for half of all surgical emergencies and three-fourths of all operative deaths, so timely diagnosis and optimal perioperative care is critical for survival.
Prevention

- Ensure that the older patient clearly understands the risks and benefits of any and all invasive procedures and is truly making an "informed" consent.
Prevention

- Determine risk versus benefit proactively. Potentially harmful diagnostic and therapeutic procedures may well be contraindicated if the potential benefit does not clearly increase the potential for improving patient outcomes.
- Maintain a heightened awareness and assessment of the situation while reviewing risks and benefits, and err on the side of caution with the older patient.
Nosocomial Complications

- Events that are not directly related to the illness or
- Not an expected effect of a treatment.
The most common preventable and potentially life threatening iatrogenic complications in the hospitalized older adult include:

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Nosocomial Infections

- Affects approximately three million American patients every year causing 60,000 deaths at a cost exceeding 4 billion in direct healthcare costs.
- Occur in 6-17% of hospitalized older patients and an equal number of nursing home residents.
Nosocomial Infections

- **Highest risk patients include:**
  - Geriatric patients who, once infected, are more likely to experience adverse outcomes.
  - Critically ill patients tend to be the sickest and most immune compromised patients. They also undergo more invasive procedures and intravascular devices which significantly increase the risk of secondary infection.

- **Approximately one-third of nosocomial infections are considered preventable by effective infection control programs.**
The most common nosocomial infections are those of the urinary and respiratory tracts.

- Pneumonia is one of the most common infections in both hospitalized and skilled nursing facility patients.
- Pulmonary aspiration is a complication frequently seen in neurologically impaired and post-operative patients.
- Urinary tract infections are most often related to indwelling catheter use and the risk increases by approximately 5% per hospital day.
Other infections that commonly affect hospitalized older patients include those affecting the:

- Skin - such as MRSA
- Gastrointestinal tract - especially _Clostridium difficile_ colitis
- Oropharyngeal cavity - such as _Candida_ infections
Prevention

- Hand washing remains the single most effective strategy to eliminate nosocomial infection
- Initial and ongoing staff and patient/family education regarding the significant risk of infection to hospitalized patients
- Visible reminders of the importance of infection control
- Active, continuous infection control surveillance
**Delirium** or acute confusional state

- Delirium is one of the most common iatrogenic complications in hospitalized elders
- 50% or more post-operative hip fracture and thoracic surgery patients over age 65 become delirious
Delirium

- Increased hospital stays
- Increases morbidity
- Increased risk of additional iatrogenic events and iatrogenic cascade
Deconditioning and Functional Decline

- Between 25 and 60% of hospitalized elders risk a loss of physical function during the course of hospitalization.
- Prolongs hospital stay and increases risk of nursing home placement and death.
- Nursing must recognize the older adult at greatest risk of deconditioning, and implement aggressive progressive mobilization and self care protocols and promote restraint-free care.
Malnutrition and Dehydration

- Malnutrition is the single strongest predictor of long term mortality in the geriatric patient, even if the patient receives nutritional interventions in the hospital.
- Malnutrition is associated with longer lengths of stay, and increased hospital and home health costs.
Malnutrition and Dehydration

- The prevalence or risk of malnutrition in hospitalized patients, ranges from 40-62% with up to 78% of patient's nutritional status noted to deteriorate during hospital stay.

- Age-related diminished thirst sensation and inability to concentrate urine, medications, altered level of consciousness, and cognitive or functional impairment can contribute to dehydration and malnutrition.
Pressure Ulcers

- Malnutrition
- Inactivity
- Dehydration
- Skin changes in aging
Urinary Incontinence

- Affects 33% of patients in acute care and 50-80% in skilled nursing facilities.
- Functional incontinence, in which patients are unable to meet their own elimination needs, is very common in acute care setting.
- One of the most common causes of nursing home placement.
- Contributes to development of pressure ulcers, social isolation and depression.
Depression

- Cognitive impairment may be either a presenting symptom or a result of depression.
- Depression in older adults commonly presents atypically with increased complaints of physical and somatic complaints.
- May coexist with anxiety.
- Associated with increased morbidity and mortality with highest suicide rates noted among older men.
Fecal Impaction

- Primary risk factors for fecal impaction include polypharmacy, especially with constipating medications (e.g. narcotic analgesics, calcium channel blockers, iron) and chronic use of laxatives, immobility, reduced fluid intake, malnutrition, weakness, delirium, dementia, and depression.

- Prevention of fecal impaction and assisting patients to manage constipation is critical to avoid unnecessary surgery and resultant pain and suffering.
Provider Values, Beliefs and Attitudes

- A perception of older adults as chronically ill and frail may foster increasing dependence and functional decline when the patient is not provided the opportunity or assistance to routinely ambulate or engage in self-care skills.

- Most physicians are poorly trained in geriatric healthcare, unaware of the importance of the core concepts of geriatric medicine that promote function, and an interdisciplinary approach with emphasis on early discharge planning.
The present system of hospital care not only perpetuates dependency and iatrogenesis among geriatric patients, but tends to "erode their self-esteem, identity and individuality."
Iatrogenesis

- Falls or other accidental and environmentally-induced accidents, and
- Harmful effects to patients related to the values, beliefs, prejudices, fears and attitudes of well intentioned, but ignorant providers
Age Related Factors

Age-related factors that predispose the older patient to iatrogenesis include:

- Diminished physiologic reserve
- Impaired compensatory mechanisms
- Atypical presentation of illness, which complicates accurate diagnosis and treatment.
Age Related Factors

- More co-morbid, chronic medical conditions, that require more diagnostic procedures and medications
- Polypharmacy - The prescription, administration or use of more medications than clinically indicated
Age Related Factors

- Increased cognitive and functional impairment
- Other risk factors for iatrogenic complications include:
  - Increased severity of illness and complexity of care
  - Greater numbers of prescribed medications
  - Admission from nursing home or other acute care facility
  - Longer length or stay
  - Lack of attention to functional impairment
Healthcare Priorities

- Use of computerized systems that share information with other clinicians.
- Have access to information about high risk drugs to avoid in the elderly and common drug-drug and drug-nutrient interactions.
What? Thought this was all about the older adult?
Study by Dr. Bourgeois from Children’s Hospital in Boston in this month's *Pediatrics*

The study looked at untoward reactions to prescribed medications in children in an outpatient setting.

Based on national statistics of patient visits to clinics or emergency rooms during 1995 - 2005.
Greater than 500,000 children in the U.S. have reactions or side effects from medicines that require some type of medical treatment each year. Usually from antibiotics. Often rashes, diarrhea or abdominal discomfort. 5% of children studied were hospitalized. Children under 5 consisted of 43% of all cases. No deaths.
Adverse Reactions to Drugs

- A similar number, over 500,000 children per year who are hospitalized also have a drug reaction or adverse event
- Reactions can be:
  - Incorrect drug or dose
  - Allergic reaction
Adverse Reaction to Drugs

- A common problem with outpatients is with the use of liquid medication
- Parents can become confused with ml, drops, ounces, teaspoons
- Parents need careful teaching in medications and side effects to watch for
Thank you

Questions?