Utilization of Technology to Improve Geriatric Care in the Emergency Department

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The Aging Imperative

- Persons aged 65y and older constitute 13% of the population and purchase 33% of all prescription medications
- 40% take 5 or more medications
- By 2040, 25% of the population will purchase 50% of all prescription drugs
Challenges of Geriatric Pharmacotherapy

- New drugs available each year
- FDA approved and off-label indications are expanding
- Changing managed-care formularies
- Advanced understanding of drug-drug interactions
- Increasing popularity of “nutraceuticals”
- Multiple co-morbid states
- Polypharmacy
- Medication compliance
- Effects of aging physiology on drug therapy
- Medication cost
Consequences of Overprescribing

- Adverse drug events (ADEs)
- Drug interactions
- Duplication of drug therapy
- Decreased quality of life
- Unnecessary cost
- Medication non-adherence
Prescribing Cascade

Adverse Drug Events (ADEs)

- Responsible for up to 28% of acute geriatric hospital admissions
- Greater than 95% of ADEs in the elderly are considered predictable and approximately 50% are considered preventable
- Most errors occur at the ordering and monitoring stages
Beers Criteria

• Beers criteria is a list of 53 medications in 3 categories: should generally be avoided, should be avoided, and used with caution
• PIMs which pose serious problems (delirium, GI bleeding, falls, fractures)
• Goal: Improve care by ↓exposure to PIMS
67% of ED Admissions Related to:

- Warfarin, 33.3%
- Insulins 13.9%
- Oral antiplatelets 13.3%
- Oral hypoglycemic 10.7%
- 1 in 6 ED patients receives a PIM (2.7 million)
- 5 most common PIMs: promethazine, ketorolac, propoxyphene, meperidine, and diphenhydramine
- Promethazine and ketorolac accounted for 40%
Getting Started

• Initial surveys
  – Type of technology
  – Knowledge of Beer’s Criteria
  – PIMs given in ED
• Differences between day and night shifts
Education

- iPads preloaded with geriatric care apps attached to rolling iPad medical carts
- Beer’s Criteria pocket cards, and posters focusing on Beer’s Criteria medications related to ED presentation were utilized.
iPad and Cart
iGeriatrics
American Geriatric Society App

AGS
Management of Atrial Fibrillation

Geriatric Cultural Navigator

GeriPsych Consult

Guide to Common Immunizations

Management of Atrial Fibrillation

Prevention of Falls Guidelines

Prevention of Falls Guidelines

Beers Criteria

GERIATRICS CULTURAL NAVIGATOR

PREVENTION OF FALLS GUIDELINES

AGS
GERIPSYCH CONSULT

AGS BEERS CRITERIA

AGS THE AMERICAN GERIATRIC SOCIETY
Beers Criteria

Alprazolam
Amiodarone
Amitriptyline
Amobarbital

Free water excess

Na
Weight

mmol/L
kg
L

Learn More!
Epocrates

Physician's Perspective

Physicians Should Be Lifelong Learners

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I recently had the opportunity to discuss an interesting patient case with Myron Miller, MD, a Clinical Geriatrics editorial board member and a noted authority on posterior pituitary function. This experience served as a reminder to us all that we must always seek new knowledge.

The patient, Dr. Miller and I discussed was an elderly man who had fallen, resulting in a fracture of his C2 vertebra. Imaging of the patient’s head showed no abnormalities or any obvious bleeding. Although his initial serum sodium level was 130 mEq/L, it continued to drop daily, reaching a low of 127 mEq/L. This finding in combination with a urine sodium level of 170 mEq/L led to a diagnosis of syndrome of inappropriate antidiuretic hormone secretion (SIADH), which is defined as an abnormal condition characterized by the excessive release of antidiuretic hormone, causing the body's fluid and electrolyte balances to be altered. The question was: what was the mechanism for this finding in the patient? Some clinicians thought that he had been given too much fluid, but his urine sodium level did not support this hypothesis as the cause of his declining serum sodium level. We were unable to obtain information on his baseline serum sodium level, but it is not uncommon for older patients to have hyponatremia due to an age-related increase in vasopressin and reduced aldosterone secretion. However, this likely would not lead to a further decrease in his serum sodium level over such a short period of time after a traumatic event. It appeared that something else was contributing. His chest radiograph showed no lesions that might lead to SIADH, and SIADH from neurotrauma, which is usually seen in the setting of a head bleed or of trauma to the pituitary gland itself, was already ruled out by imaging studies. Therefore, I turned to Dr. Miller for his insights.

It was a pleasure hearing Dr. Miller discuss other possibilities with me, and I listened attentively, much like a student listens to any noted professor. Dr. Miller’s differential diagnosis included cerebral salt-retaining syndrome (CSW), which is defined as a rare endocrine condition that is associated with hyponatremia and hydremia in patients with advanced heart failure, renal failure, or to the presence of a tumor or hemorrhage in or around the brain. Hyponatremia is caused by an excessive renal sodium excretion from a centrally mediated process. Symptoms include polyuria (at least 2.5 L in 24 hours) due to inadequate sodium retention, excessive thirst and extreme salt craving, dysautonomia, and dehydration. As the disease progresses, symptoms may also include muscle cramps, lightheadedness, dizziness, or vertigo; anxiety; cardiac issues, including rhythm disturbances; and cognitive symptoms.
Geriatrics At Your Fingertips 2013

Geriatrics At Your Fingertips™ is an essential tool for all healthcare providers and trainees who care for older adults. It contains specialized, up-to-date evaluation and management strategies for common geriatric conditions and disorders.

- Over 100 tables containing current medication information, searchable by generic or trade names
- Easy-to-use algorithms
- Assessment instruments that calculate responses
- Fast, comprehensive search and index functions
- Calculating equations for commonly used formulas
- A bookmark feature for frequently referenced content
- Links to many resources and websites
Findings

• After three months of use, pre- and post-test information collected
• Indicated increased knowledge of the Beer’s criteria and Beer’s criteria medications in the ED
• Associated with a positive change in practice
• Surprisingly….
Follow-Up Evaluation

• Not all methods of delivery were considered useful in the fast-paced ED environment

• Face-Time applications were used to improve patient communication…but not with geriatric patients
Questions
References