



The Evaluation of Meperidine Use in Adult Patients

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- Meperidine is a synthetic opioid analgesic associated with significant CNS side effects
- Several organizations recommend or caution against the routine use of meperidine
 - American Pain Society (APS)
 - Institute for Safe Medication Practices (ISMP)
 - Beers criteria for potentially inappropriate medication use in older adults
 - Agency for Healthcare Research and Quality (AHRQ)

American Pain Society. JAMA. 1995;274:1874-80.

The Institute for Safe Medication Practices. High alert medication feature reducing harm to patients. February 22, 2007.

Fick D, Cooper J, Wade W, Waller J, Maclean J, Beers M, et al. Arch Intern Med. 2003;163:2716-24.

Acute pain management guideline panel. AHCPR Pub. No. 92-0032. Rockville, MD. 1992.

- Meperidine Medication Use Evaluation (MUE) completed in 2006-2007
 - assess adherence to organization guidelines established in 2002
- 2007-2008 performance improvement follow-up

- Management of acute pain episodes of moderate to severe pain in patients
 - Unmanageable adverse reactions to other first-line opioid agents
- Prevention or treatment of drug-induced or blood product-induced rigors
- Treatment of post-anesthesia shivering
- Research protocols specifying the use of meperidine
- Neuraxial analgesia for acute pain management administered by the anesthesiology service

2002	Organization guidelines developed outlining the appropriate use of meperidine
2006 to 2007	MUE performed to assess adherence to guidelines
2007	Guidelines modified based on MUE results
2008	Educational interventions developed to meet hospital needs, and performance-improvement follow-up

MUE Results (2006 to 2007)

Appropriate Indications		35 (22%)
Acute pain episodes with unmanageable reactions to first-line opioids		8 (5%)
Prevention or treatment of rigors and treatment of post-anesthesia shivering		16 (10%)
Neuraxial analgesia for acute pain management used by the anesthesiology service		11 (7%)
Inappropriate Indications		125 (78%)
Moderate sedation for endoscopic procedures		80 (50%)
No documented indication		25 (15%)
Other (post-operative pain, breakthrough pain)		20 (13%)

MUE Results (2006 to 2007)

78%	Inappropriate indication
89%	Appropriate dose and route of administration
33%	Meperidine usage by GI service
8%	Meperidine usage by CT surgery service
10.6%	Patient with an absolute contraindication
4%	Patients with renal insufficiency
18%	Patients ages 65 and over with renal insufficiency

Recommendations

- Revision of the guidelines
- Removal of oral meperidine from the formulary
- Removal of meperidine from all preprinted order forms
- Multidisciplinary education
- Automatic stop after 48 hours
- Dispense message added to pharmacy order entry system

Modification of Organization Guidelines

- Addition of the indication for moderate sedation in gastroenterology procedures
 - Patients less than 65 years of age who meet the following criteria:
 - Normal renal function ($\text{CrCl} \geq 50 \text{ mL/min}$)
 - No seizure history or are taking medications that lower the seizure threshold

Modification of Organization Guidelines

- Defining elderly patients
 - Patient \geq 65 years old
- Additional precaution statement
 - Calculated creatinine clearance for elderly patients may be falsely elevated and should be used with caution when considering using meperidine
- Addition of a clinical practice points section
 - Provides dosing and administration guidance
 - Provides morphine as an alternative option for the treatment of rigors

Purpose

- Develop and implement educational interventions
- Evaluate meperidine use after educational interventions
 - Primary outcome
 - Assess adherence to the updated MUSC guidelines for meperidine use
 - Secondary outcomes
 - Evaluate prescribing practices that deviate from the guidelines, adverse effects, and prescribing services

- Presentations
 - Chief medical residents
 - GI service
 - Clinical specialists and pharmacists
- Pocket cards and flyers for the GI service
- Newsletter article
 - *Pharmacy and Therapeutic Update: Drug Information For Healthcare Professionals*
- Requested updates to preprinted order forms

Using Meperidine?

- Make sure your patient meets **ALL** of the following requirements:
 - Less than 65 years of age
 - Creatinine clearance (CrCl) at least 50 mL/min
 - No seizure history
 - Not on any concurrent medications that lower the seizure threshold
 - SSRIs [eg, fluoxetine (Prozac®); paroxetine (Paxil®); sertraline (Zoloft®)]; bupropion (Wellbutrin®); tramadol (Ultram®)
- If your patient does not meet the above requirements, please use an alternative opioid for sedation
 - Example: fentanyl 0.05 to 0.1 mg IV

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- Development and distribution of educational materials to targeted health care services
- Retrospective chart review
 - 60 patients
 - May 1, 2008 to July 1, 2008
 - Same design as the MUE in 2006 to 2007
- Data analysis to determine the appropriateness of therapy based on modified guidelines
 - Compare with previous data

- Inclusion criteria
 - 18 years of age or older
 - Received at least 1 dose of meperidine
- Exclusion criteria
 - Pregnant at time of administration

- Data to be collected include:

Patient demographics	Age, race, gender, medication allergies
Previous medical history	Seizure disorder, chronic renal insufficiency
Contraindications	Renal insufficiency, Addison's disease, MAOI use within past 14 days, BPH, untreated hypothyroidism, urethral stricture
Concomitant medications	MAOIs, SSRIs, bupropion, opioids, antiepileptics, imipenem/cilastatin`
Meperidine use	Service, indication, dose, frequency, duration, adverse drug reaction

Limitations

- Education roll-out
- Retrospective chart review

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