**Dexmedetomidine utilization evaluation in intensive care units across the Memorial Hermann Health System**

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OBJECTIVE

To evaluate the utilization of dexmedetomidine in intensive care units across Memorial Hermann Health System in regards to indication, patient outcomes and patient safety.

BACKGROUND

Dexmedetomidine (Precedex®) is an intravenous centrally-acting selective alpha-2 receptor agonist. It is approved for ICU sedation of initially intubated, mechanically ventilated patients and for procedural use in non-intubated patients. The FDA approved dosing range is 0.2-0.7mcg/kg/hr, but doses up to 1.5mcg/kg/hr has been studied that showed safety with higher incidences of sinus bradycardia. In clinical trials, dexmedetomidine has been shown to result in more days alive without delirium or coma and less time on the ventilator with comparable sedation levels achieved compared to benzodiazepine infusion. In a cost analysis trial, dexmedetomidine resulted in significantly lower total ICU costs primarily driven by the decrease in mechanical ventilation costs and length of ICU stay costs.

The goal of this MUE is to compare the utilization of dexmedetomidine in intensive care units across the Memorial Hermann health system and identify if our current use of dexmedetomidine is decreasing the total ICU costs.

DESIGN

* Inclusion: all ICU patients who received dexmedetomidine
* Exclusion: Age < 18 years old
* Time frame: FY 2015
* Data points
  + Demographics
    - Age
    - Sex
    - Race
    - Hospital location
    - Reason for ICU admission
      * Surgical
      * Medical
    - SOFA Score
    - Weight
    - Mechanical ventilation (Y/N)
    - Presence or absence of substance abuse
      * Blood EtOH (+) on admission
      * UDS
      * History
  + Dexmedetomidine therapy
    - Indication of dexmedetomidine
      * ICU sedation
      * Shivering management
      * Alcohol withdrawal
      * Procedural sedation
    - Duration of dexmedetomidine
    - Bolus of dexmedetomidine
    - Cumulative dose of dexmedetomidine per hospital course (mcg/kg/hr)
    - Max rate of dexmedetomidine dose
    - Total number of courses of therapy for dexmedetomidine
  + Outcomes
    - ICU length of stay
    - Hospital length of stay
    - Total mechanical ventilator duration
    - Mechanical ventilator duration on dexmedetomidine
    - Level of sedation (RASS)
    - Simultaneous use of other sedatives
      * Simultaneous use of propofol (Y/N)
      * Simultaneous use of ketamine (Y/N)
      * Simultaneous use of benzodiazepine (Y/N)
      * Simultaneous use of opioids (Y/N)
    - Average rate of dexmedetomidine per hospital course
  + Safety outcomes
    - Bradycardic incidence (HR < 55 bpm or administration of atropine)
    - Hypotension (New onset of SBP < 80 mmHg, MAP < 60, or requiring vasopressors)
  + Cost
    - Daily average cost of dexmedetomidine
    - Total cost of dexmedetomidine per patient
    - Cumulative cost of ICU stay (MV days + drugs + ICU days)

PHYSICIAN CHAMPION: Bela Patel, MD

REFERENCE:

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