Safe Epidural Administration and Management in the Obstetric Population

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"To Err is Human."
- Alexander Pope

- The problem this Capstone project aims to address is that of human error in the administration and management of obstetric epidural anesthesia and analgesia
- One of the most specialized procedures performed by anesthesia practitioners
- The complexity of epidural placement lends to its propensity for inviting errors.

Project Description

Our four-fold approach consisted of:
- Performing a thorough review of literature aimed at:
  - defining the problem at hand
  - determining causative factors
  - addressing practical ways to improve practice
- Compiling this information into an effective and informative PowerPoint presentation
  - Included simulated videos of potential clinical scenarios
- Educating the ADU Junior Student Nurse Anesthesia class
- evaluating the effectiveness of the presentation through statistical analysis of pre and post-test scores

Background

Review of Literature

A thorough review of literature included peer reviewed articles and studies within the last 10 years.

Medication and Epidural Error Statistics

- Premature deaths associated with preventable harm to patients at upwards of 400,000 per year (James, 2013).
- "1600 reports of epidural to central or peripheral intravenous misconnections since 1999" (Block, Horn, Schelsinger, 2012).
- A study identified epidural administration as the most difficult to learn of the manual anesthesiological skills (Konrad, Schupfer, Wietlisbach, & Gerber, 1998).

Qualitative and Anecdotal Evidence

- A plethora of tragic accounts support epidural anesthesia as a hotspot for potential errors
- St. Mary’s Hospital in Wisconsin: nurse gave Bupivacaine, an epidural anesthetic, intravenously
  - Within minutes, patient suffered from seizure and expired (“Nurse charged with felony,” 2007).
- St George Hospital: practitioner mistook antiseptic solution for local anesthetic
  - Injected 8ml intrathecally
  - 32 year old new mother suffered severe neurological damage. (Robotham, 2011)

Findings & Recommendations

Many trends emerged in terms of causative factors in epidural related errors

- Environmental Distractions
  - Noise
  - Lighting
  - Staff/patient

- Human Factors
  - Fatigue
  - Stress
  - Multitasking
  - Knowledge Deficit

- Processes and Protocols
  - Be knowledgeable of and adhere to both AANA and institution-specific standards
  - Take special care in labeling substances, and strictly practice the “Five Rights of Medication Administration

Results

Statistical analysis of pre and post-tests provided a quantitative measure of the effectiveness of the presentation provided to the first year SRNA class.

- The obtained t-value (-7.910) is associated with p of <. 05, which indicates statistical significance.
- Mean test scores increased significantly from pre-test (2.4348) to post-test (6.0000).

<table>
<thead>
<tr>
<th>Group</th>
<th>N</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>Std. Error Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-Test</td>
<td>23</td>
<td>2.4348</td>
<td>2.01859</td>
<td>-2003</td>
</tr>
<tr>
<td>Post-Test</td>
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References

References available upon request. Please contact:
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