Name of the speaker:

☑️ I have no link of interest.
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☑️ I have the following potential links of interest to report:
  ☑️ None
Resident Performance in Complex Simulated Urinary Catheter Scenarios

J. N. Nathwani¹, K. E. Law², R. D. Ray¹, B. R. O’Connell Long¹, R. M. Fiers¹, A. D. D’Angelo¹, S.M. DiMarco, C. M. Pugh³

¹ University Of Wisconsin, Department of Surgery, Madison, WI, USA
² Mayo Clinic, Industrial And Systems Engineering, Rochester, MN, USA
³ Stanford University, Department of Surgery, Stanford, CA, USA
Introduction

• One in four hospitalized patients require a Urinary Catheter
  • Most common hospital acquired infection
    • Result of improper insertion and management
    • Development of guidelines

• Unclear if surgical residents have adopted these guidelines
  • Educational standards coming under closer scrutiny
  • Education is becoming standardized to ensure competency
    • American College of Surgeons and Association of Program Directors in Surgery Resident Skills Curriculum
    • Simulation has been incorporated
    • Urinary catheters defined as a basic skill
Introduction

- AIM: to assess surgical trainees ability to insert and troubleshoot difficult urinary catheters in the setting of common and complex urinary pathology

- Hypothesis: Residents will make inconsistent decisions in relation to catheter choices and clinical presentations, and they will not have achieved mastery
Materials and Methods

• Setting and Participants
  • Prospective, skills assessment study
  • 7 Midwest General Surgery training programs
  • Primary recruitment efforts for surgical residents entering their first research year
Materials and Methods

• Research Protocol
  • Demographic and self assessment survey
    • Personal confidence in completing the requested task
    • Perceived skill reduction while in the research years
  • Directed to Urinary Catheter Station
Protocol

- 15 minutes to finish 3 of 4 urinary catheter scenarios

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Description</th>
<th>Known</th>
<th>Unknown</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Female, Trauma</td>
<td>Pelvic X-ray: Pelvic Fx</td>
<td>Bladder Injury</td>
</tr>
<tr>
<td>B</td>
<td>Female, Pre-Op</td>
<td>None</td>
<td>Labial Constriction</td>
</tr>
<tr>
<td>C</td>
<td>Male, Pre-Op</td>
<td>Rectal CA, LAR</td>
<td>Complete Obstruction</td>
</tr>
<tr>
<td>D</td>
<td>Male, Retention</td>
<td>BPH</td>
<td>None</td>
</tr>
</tbody>
</table>
Materials and Methods

• Data collection: Catheter choices, number of attempts, attempt number that led to successful return, and errors committed while inserting the catheter

• SPSS
  • Descriptive stats, Linear Regression Analysis, Chi-Square Analysis, Logistic Regression
Results

- 45 participants (56% female)
  - PGY 2 - 4 (M = 2.7, SD = 0.9)
  - 44% - First Year Research Residents
  - 22% - Second Year Research Residents
  - 33% - Clinical Residents
Results

• Pre-sim confidence
  • AVG 4.42 (SD = 0.85)
  • No difference in PGY level
  • Lower the resident confidence, more likely they were to commit error
  • Higher presim confidence led to earlier placement of Urology Consult

• Post-sim confidence
  • AVG 3.56 (SD = 0.81)
  • No relationship between post confidence and errors
Figure 1. Most popular initial catheter choice followed by second and third most popular catheter choices when participants fail with initial catheter (* = p < .01)
Figure 2. Success rates for scenario performances

Total Success: 50%  82%  0%  40%
Results

Figure 3. Percent of residents committing the most common errors at least once

- Does not maintain sterile field: 40.0%
- No lubricant used: 33.3%
- Inflates balloon after bloody urine return: 15.6%
- Inflates balloon before urine return: 13.3%
- Fails to check placement of catheter after balloon inflation: 8.9%

Percent of residents
Discussion

• What did we expect?
  • Female: 14 or 16 Fr first with systematic upsize
  • Male: 16 Fr foley or Coude
    • Coude if started with Foley
    • Upsize if coude
    • Verbal request to upsize
  • Less than one error per participant

• What did we find?
  • Residents are under prepared
    • Limited knowledge and experience in catheter insertion
Discussion

• Survey Results
  • Lower confidence with higher errors
  • Higher presim confidence sooner consults

• Can self assessment surveys serve as accurate predictors of performance?
• Resident skills
  • Initial choices seem deliberate
    • A – C 16 Fr Foley, D 16 Fr Coude

• Strategy in choice?
  • 16 Fr Coude in setting of BPH

• Highest chance of success is first attempt
Discussion

• Technical Performance
  • Leading technical error is a major risk factor for UTI
    • 40% of participants break sterile field

• Next leading errors can cause major iatrogenic injury
  • Lack of lubricant, improper balloon inflation
    • Potential for consultation, operative repair, UTI risk factor, and CI to catheterizing
Discussion

• Lack of experience and education
  • Responsibilities have shifted towards nursing staff
  • Leaves resident staff with little experience and ill-equipped to troubleshoot
• Premature Urology consults
  • 72% direct consultation to Urology without attempt
  • 66% standard catheterizations
Discussion

- How do we fix this?
  - Revision of curriculum
    - Addition of complex scenarios and algorithms
  - Simulation
    - Cheap, safe, infinite opportunities for repetition
    - Opportunity to encounter difficult scenarios
  - Overall effect
    - Potential return in investment of training
      - Central venous catheter training: 7:1 return in investment
      - Additional cost savings in minimizing consults
Thank You