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Improving Postoperative Handoffs in the Neuro-Intensive Care Unit Richard F. Schmidt, MD¹, Andrew Mendelson, MD², Sonia Gill, MD³, Nicole Hollup, CRNP¹, Matthew Vibbert, MD^{1,3}, Colleen Vernick, MD², Giuliana Labella, MSN⁴, Marie Wilson, MSN⁴, Caitlin Harley, MSN⁴, Maryanne McCarrin, MSN⁴, Jack Jallo, MD¹ Rebecca Jaffe, MD⁵ 1=Department of Neurosurgery, 2=Department of Anesthesia, 3=Department of Neurology, 4=Department of Nursing, 5=Department of Medicine

- Introduction Structured IPASS Handoff and Postoperative Process Flowchart. I-PASS OR to NICU HANDOFF patient morbidity/mortality, and increased healthcare waste. ALL TEAM MEMBERS AT BEDSIDE, PATIENT'S NURSE ANNOUNCES READY TO STAR' <u>nesthesia</u>: Present 1 liner on patient • Stable, watcher, unstable handoffs and care transitions for perioperative services and neuro-Illness Severity Veurosurgery intensive care. Diagnosis, surgical history, and procedure • Surgical events, complications, and results (i.e. TICI, %resection) Presence of drains/catheters (i.e. JP, EVD, Sheath) Pre-operative neurological exam D • Expected post-operative exam in adverse events and 23% reduction in medical errors. PMHx, Medications, Allergies Patient Summarv • Airway issues during case and current airway Hemodynamics during surgery and transport Lines in place Fluid summary (UOP, EBL, fluids/blood products received) resulted in improved organization, safety, and communication. • If intubated, plan for extubation Active infusions • Pain medications given • Timing of last antibiotic dose eurosurgery: Post-op plar • Neuro – Imaging plan, neuro-checks, labs, pain control limitations • CV – BP goals A Pulm Action List Rena improved handoffs and guide future interventions. • Endo – Pituitary function if relevant • Heme/DVT PPx – Include SubQ heparin plan Wound – Dressing plan \mathbf{C} Neurosurgery and Anesthesia \mathbf{D} assess existing staff perceptions and practices regarding • Concerns or anticipated complications for the next 24 hours • Who should be contacted for questions? Situational Awareness and postoperative handoff practices in the NICU. Contingency Plannin NICU physician/APP/Critical care nurse: Summary statement of what was heard • Ask clarification questions practices in real time. process map and structured IPASS handoff – was created and implemented by the multi-disciplinary working group. **Postop Handoff Characteristics** ອ ຊິ 100₁ intervention survey as well as serial handoff observations were conducted to reassess the process and guide future interventions. es **80 60** Handoff Behaviors - Senders 40 Handoff Behavoirs - Receivers Always/Often 100₁ Sometimes cent Always/Often Rarely/Never Sometimes 80 Rarely/Never Φ 60 60· Ω Efficient Comprehensive Safe Organized **40** Handoffs and Team Communication 20-20-ອ ຊິ 100 Happy with Ask for Find Forget Happy with Access EMR clinicians handoffs questions information handoffs sp 80 n.s. Re n.s.

- Transitions of care represent a major source of medical errors, • 2018 CLER report indicated largely unfavorable responses toward • Use of the IPASS handoff tool is associated with up to 30% reduction • Implementation of IPASS for postoperative handoffs in the SICU Methods • A multi-disciplinary working group was created to assess the need for • A preliminary survey was created using the RedCap database to • Serial observations of handoffs were conducted to observe existing • A formalized handoff process – including both a postoperative • Following an initial intervention phase of 4 months, a brief post-Results FIGURE 1: Pre-intervention Survey - Behaviors and Suggestions



Results separated by responses team (blue - Neurosurgery, team (red - NICU, Nursing, etc.). There was some cross-over (i.e. Results for handoff perceptions compared to post-intervention results in Figure 3.

affiliated with either the sending anesthesia, etc.) or the receiving anesthesia), so team membership was based off of self-determination (sender/receiver/both) in the survey.

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Problems

Cooperation Often Occur Often Lost

FIGURE 2: Proposed Intervention:



Handoff outline developed from multi-disciplinary input. Important characteristics specific to NICU patients are emphasized (i.e. focus on neurological status, outcome scores, pain-control limitations, etc.) do address more patient specific concerns.







Observed handoff behaviors of staff during the pre-intervention (blue) and post-intervention (red) periods. Observations were performed by NICU nursing educators and charge nurses. Comparison performed with Chisquared test. *** = p<0.0005, ** = p<0.005, * = p<0.05, n.s. = not significant

FIGURE 5 (right): Staff **Perceptions of IPASS** for Postop Handoffs

Graphs show percent favorable response to prompted questions regarding the IPASS handoff process. There was overwhelming support for the process and its continued use and improvement from both sending and receiving teams.

Conclusions and Next Steps

- Postoperative NICU handoffs using IPASS improve:
 - Objective measures of handoff quality including communication of critical patient centered content.
 - Subjective perception of handoff quality Including perceptions of organization, efficiency, safety, comprehensiveness, and teamwork.
- There is strong support for the use IPASS format as a structured, standard format for postoperative NICU handoffs, and the vast majority want to continue its use.
- Barriers and next steps for further improvement:
 - Identifying and addressing "high-risk" times when it is difficult for all providers to be in attendance – i.e. evening signout, conferences • Streamlining the handoff process for improved efficiency and timeliness • There was no significant improvement (despite trend) in staff
- remaining for entirety of handoff

 - Consideration of other urgent clinical responsibilities. • Increasing data collection - Quantifying errors and outcomes

FIGURE 3: Postop Handoff Survey - Perceptions: **Comparison of Pre-and Post-intervention Staff Responses**

Pre-Intervention Post-Intervention



Pre-Intervention Post-Intervention



Comparisons made between identical questions on pre*intervention (blue)* surveys and early post-intervention (red) follow-up surveys.

Note for negatively worded questions (i.e. Problems Often Occur) an answer of "disagree" is considered "favorable."

Comparison performed with Chi-squared test. **** = *p*<0.0001 ** = *p*<0.005 n.s. = Not significant

FIGURE 4: Postop Handoff Observations: **Comparison of Pre-and Post-intervention Communication**

