Quality, Safety and the Physician Handoff

John M. McGregor, M.D.
Department of Neurological Surgery
Co-Chairman - Neuroscience Clinical Quality Management Committee
Ohio State University Wexner Medical Center

NeuroSafe Symposium 2016

Oak Ridge Conference Center, Chaska, MN
July 15-16, 2016
Quality and Safety Disclosures 7/15-16/2016

- Disclosures
  - I have no financial relationships to disclose.

- Investigational/off label use
  - I will not discuss off label use and/or investigational use in my presentation.
Quality, Safety and the Physician Handoff

John M. McGrew, MD, FAANS | Departments | Patient Safety
AANS Neurosurgeon | Volume 24, Number 5, 2015

In a previous Patient Safety feature, we highlighted the importance of teamwork to promote patient safety. Continuing this important theme, we present the first part of this two-part article on the priority of the provider-to-provider handoff for the safe care of our patients.

Physician Handoff

1) Definition
2) Scope of the Opportunity
3) Research Available
4) Effects of Education
5) Handoffs and Patient Outcomes
6) Handoff Literature in Neurosurgery
7) Future Directions
The Physician Handoff

- Patient information exchange occurs throughout the hospital stay
  - Consultants, Nursing, Allied Health, Perioperative Services

- The Physician Handoff:
  "The exchange between health professionals of information about a patient accompanying either a transfer of control over, or of responsibility for, the patient"¹

- On call or shift exchanges of coverage, transfer of care or services.

As Complexity Increases….

- No longer one admitting physician
- Transfers of information and of care are more frequent and more sophisticated.
- Handoffs are up 40% since introduction of duty hours
- 24 physician handovers during the average hospital stay
- 36-million discharges per year in the country

Key point in health care delivery

- Joint Commission:
  “The consequences of substandard hand-offs may include delay in treatment, inappropriate treatment, adverse events, omission of care, increased hospital length of stay, avoidable readmissions, increased cost, inefficiency from rework, and other minor or major patient harm”

- 60% of inpatient medical adverse events may be attributed to improper communication

- Major Stakeholders have initiatives and targets:
  - Institute of Medicine (IOM),
  - World Health Organization (WHO)
  - The National Quality Forum (NQF)
  - National Patient Safety Foundation (NPSF)

- Consequences for:
  - Patient Safety and Resource Utilization

Relevance for resident training

- Increased number of handoffs came with restrictions of hours.
- ACGME
  - Programs must monitor staffing to minimize handoffs
  - Programs must educate and evaluate communication effectiveness, including handoffs
- AMA offers resident resources
- HHS (AHRQ) offers:
  - Clearinghouse for research on communications including handoffs (Patient Safety Network)
  - https://psnet.ahrq.gov
- Third party apps, EMR handoff features
  - Tools designed to provide opportunity for better handoffs
EMR Opportunities
Research in Handoffs

- Robertson, et. al. 2014
  - 631 publications on handoff
  - Inclusion: Improving quality or safety, hospital, pre and post assessments, beneficial effects on knowledge, time, outcomes
  - 29 met criteria, 10 with clinical outcomes, 2 with benefit (decreased adverse events, length of stay)
  - 2 were RCT’s, showed no benefit

  - 2,590 publications on handoffs
  - 18 with research, 6 measured effectiveness.
  - 91 common barriers to effective handovers
  - 130 different strategies used

Research in Handoffs

- DeRienzo et al. 2012
  - 919 papers that analyzed handovers were reviewed
  - 3 Themes
    - Structure
      - 24 different pneumonics (SBAR was most common)
    - Education
      - Improved compliance with interactive or simulation training
    - Evaluation
      - Safety measures, Quality measures, Confidence in process measures
  - No best standardized structure

Research in Handoffs

3 aspects of good handoffs$^{1,2}$

- Training
  - Formal didactic and interactive
- Face-to-face, uninterrupted
  - (verbal and written/electronic handoff is best)
- Data
  - unambiguous and factually correct

Barriers to Effective Handoffs

- **Time**
  - Reduces quality of verbal handoff
  - Decreases number of direct communications
  - Limits ‘read-back’ and questions

- **Interruptions**
- **Tools:** Written data alone
- **Lack of standardization**
  - Inconsistency

- **EMR-double edged sword**
  - Improved numerical accuracy and completeness
  - Lack of attention to details and to non-numeric issues

- **Experience level**
  - More senior involvement improves communications

"I have always been complaining that my work was constantly interrupted, until I slowly realized that my interruptions were my work."

- Henri Nouwen, Out of Solitude
Handoffs and Patient Outcomes

- Poor Handoffs\(^1\):
  - Increased adverse events
  - Increased SICU admissions
  - Increased lengths of stay
  - Result in higher costs
  - Data generally single site, historical

- Handoff Education\(^1\):
  - Improves the process
  - Improves confidence

- Improving Handoffs Improves Patient Outcomes?
  - Data lacking

Handoffs and Patient Outcomes

  - 169 IM residency programs with and without Handoff Training
  - Index Cases
    - AMI, CHF, Pneumonia
  - Benefit:
    - Mortality from pneumonia (11.0% vs. 11.8% p=.01)
  - No Benefit
    - 30 day readmission rates
    - Other patient mortality
      - Acute MI
      - CHF

Handoffs and Patient Outcomes

- Graham, et al. 2013
  - Hospital system-wide (Beth Israel, Boston) education
  - IM night float exchanges
  - Ideal handoff:
    - Summary, PMHx, Active problem list, Current status, anticipatory guidance
  - Intervention
    - Face-to-face exchanges
    - Standardized template
  - Improved:
    - User Satisfaction
    - Perceived content quality
    - Fewer data omissions
  - Not Improved
    - Adverse events

Handoffs and Patient Outcomes

- Starmer, et al. 2014
  - 9 Pediatric Residency Programs
  - Intervention
    - Pre-data collection x 6 mo.
    - Education x 6 mo.
      - Standard checklist, 2-hr workshop,
      - 1-hr role-playing simulation,
      - computer based learning module,
      - faculty program,
      - assessment and feedback tools,
      - promotional campaign
    - Post-data collection x 6 mo.
    - Improved:
      - 23% error reduction,
      - 30% adverse event reduction
    - Not improved:
      - 3 of 9 centers with no observed benefit

<table>
<thead>
<tr>
<th>Site No.</th>
<th>Admissions Reviewed</th>
<th>Medical Errors</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Before</td>
<td>After</td>
</tr>
<tr>
<td>1</td>
<td>511</td>
<td>406</td>
</tr>
<tr>
<td>2</td>
<td>294</td>
<td>242</td>
</tr>
<tr>
<td>3</td>
<td>526</td>
<td>538</td>
</tr>
<tr>
<td>4</td>
<td>586</td>
<td>496</td>
</tr>
<tr>
<td>5</td>
<td>951</td>
<td>974</td>
</tr>
<tr>
<td>6</td>
<td>911</td>
<td>893</td>
</tr>
<tr>
<td>7</td>
<td>521</td>
<td>430</td>
</tr>
<tr>
<td>8</td>
<td>346</td>
<td>349</td>
</tr>
<tr>
<td>9</td>
<td>870</td>
<td>896</td>
</tr>
<tr>
<td>Overall</td>
<td>5516</td>
<td>5224</td>
</tr>
</tbody>
</table>

Handoffs in Neurosurgery

- Limited data available
  - Babu, et al., 2012
    - 98 N/S residency programs surveyed
    - 54% without standard protocol
    - 55% were always with a Chief Resident
    - 72% were interrupted 1-4 times
    - 37% had formal instruction
  - Fallah, et al., 2014
    - Special considerations
      - High patient census, rapid turnover, clinical status’ change quickly, sickest of patients, frequent family updates, covering physicians unfamiliar with large portions of patients.
      - Interruptions likely, chief or senior resident or attending physician availability for face-to-face meeting is limited, exchange of clinical nuances are needed.
    - Need for a standardized evaluated handoff tool.

Handoffs in Neurosurgery

- Kuhn, et al.,
  - Resident service handoff
    - > weekend change of responsibility
  - 3083 patients, one year, 17% had a resident service handoff
    - Results
      - Increases in admits to ICU, LOS ICU, LOS hospital
      - No change in mortality

- Burk, et al.,
  - Standardization of the post-op to ICU transition
    - Resident led
      - New brief op note template design
      - Face-to-face handoff with receiving RN
    - Results:
      - Residents (100%) and R’s (93%) felt the practice was useful

Birk, et al., Cureus. 2016 Jan 18;8(1):e461
Handoffs and Future Directions

- Future Analysis of the key elements
  - Handoffs are more than a one-way information exchange
  - There are limits to check-lists alone

- Handoff as a complex interactive event
  - Cohen, et al.
    - Complex interaction
    - Co-construct a mental image
      - physiology, laboratory trends, neurologic function, history, social context
      - Anticipation of likely care

- Hilligoss, et al.
  - Two parts:
    - Checklist
    - Narrative (allows for the ‘Singular Nature’ of the patient)
      - Not well studied

Handoffs and Future Directions

- Hilligoss, et al.
  - Organizational Theory
  - ‘Multifunctionality’
    - Information transfer,
    - Transfer of responsibility,
    - Adds resilience to the system (catching potential errors),
    - Shared mental models,
    - Learning and teaching.
  - ‘Situatedness’
    - Influence of environmental factors
      - Participant characteristics: level of training, status and authority
      - Physical factors: location, potential for interruptions,
      - Tools available: computer technologies and electronic communication
      - Division of labor: how many care givers, their locations, during a hospital stay

Handoffs and Future Directions

- Handoffs are a critical link in NS care
- They are a complex event
- Checklists should be standardized
- Exchanges are better focused and face-to-face
- Studies as to effectiveness, best practices, results are lacking in NS
- Studies at the level of the:
  - Neurosurgery service with its own peculiarities
  - Individual hospital with its potential for unique culture,
  - Healthcare system for broad applicability of best practices
Acknowledgements

Ad Hoc Neurosurgical Committee for Patient Safety of the Council of State Neurosurgical Societies

Gregory Smith - Chair
Wayel Kaakaji – Vice-Chair

Owoicho Adogwa  
Desmond Brown  
Jason Hauptman  
Juan Jimenez  
Ajit Krishnaney  
Michael Park  
Gary Simonds  
Krystal Tomei  
Sharon Webb  

Jeremy Amps  
Jack Dunn  
Kristopher Hooten  
Kristopher Kimmell  
Debraj Mukherjee  
Charles Rosen  
Sherry Taylor  
Rishi Wadhwa  
Brad Zacharia
Thank you – Questions?