The Pediatric Otolaryngology Patient Handoff in an EMR Based System

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Introduction

The Joint Commission has repeatedly shown that communication failures represent the most common cause of preventable medical errors,[1] with "handoffs" playing a major role in many of these events.[2] To that end, multiple national and international health care organizations, including the Institute of Medicine, Joint Commission, and World Health Organization have advocated for the standardization of handoff communication.[3]

Since the advent of the 80-hour work week, there has been a drastic increase in the number of handoffs performed by trainees.[4] Over a similar period of time, the use of Electronic Health Records (EHRs) has become widespread. As such, computerized handoff tools (CHTs) generated primarily by the EHR are being utilized more frequently in an effort to improve communication.[5] Finally, in response to the increased number of patient handoffs involving trainees, the ACGME has mandated that patient handoffs consist of a formal process whereby training programs can monitor the effectiveness of communications.[6]

Surgical patients are thought to be particularly vulnerable to handoff errors given their transition through pre, intra, and post-operative stages and the multi-disciplinary nature of surgery.[2] The pediatric otolaryngology population, in particular, requires significant communication as many patients have individualized airway plans and are cared for by multiple specialties. Our pediatric otolaryngology service is transitioning from a resident-updated spreadsheet to an EMR-based CHT.

Our objective was to identify areas for improvement in our current pediatric otolaryngology patient hand-off during a transition to an electronic medical record (EMR) based hand-off system.

Methods

Prospective anonymous survey of current physician members of the pediatric otolaryngology team at our institution that participate in daily patient hand-offs. (**Figure 1**)

Results

Demographics
23 respondents (n=23) 16 residents, 1 fellow, and 7 attendings
77% response rate

Current hand-off system

22/23 (95.7%) respondents believed current system adequately conveyed patient information
4/23(17.4%) of respondents believed that essential patient information was lost during hand-offs times using our current format
21/23(91.3%) of respondents felt the current hand-off system was safe
22/23(95.7%) believed that the way the current hand-off sheet is electronically stored was adequate to safeguard protected patient health information

An EMR based hand-off system

7/23 (30.43%) believed that transferring the patient information conveyed in hand-offs to an electronic database would improve the quality of information that is relayed on patient hand-offs
5/23(21.7%) believed that it would better safeguard protected patient health information
10/23(43.5%) believed that this transition would help other services/personnel better understand the current management of the patient.
10/23 (43.5%) of respondents felt that increasing the amount of attending to attending handoffs (43.5%) and increasing the amount of patient related information on hand-off sheets (43.5%) were the best way to improve patient hand-offs.

Vital information on the hand-off sheet

Most frequently identified "essential" items for the hand-off sheet:

- Patient diagnosis (100%)
- To do list (100%)
- Room number (100%)
- Emergency airway plan (95.7%)
- Type of surgery performed (95.7%)
- ENT related past medical history (95.7%)
- Primary otolaryngologist caring for the patient (87%)
- Antibiotics (87%)
- Primary service managing the patient (82.6%)
- Drain output (82.6%)

How hand-offs are conducted

When openly asked what changes we could make in the way hand-offs are made the most common answer was adding a surgeon of the day model in which a specific surgeon would sign out with the trainees and staff members regarding all patients during the beginning and conclusion of each day

Discussion

In a busy clinical pediatric otolaryngology setting, there are many handoffs in patient care. These handoffs occur both within as well as across services. With more stringent resident duty hour restrictions, the number of handoffs has risen. At the same time, use of EMR has greatly increased. The advent of the EMR system has allowed for ease of storing and sharing extensive amounts of patient information. In an attempt to improve patient care and safety, our institution implemented a transition from a manual spreadsheet to a CHT generated primarily by EMR.

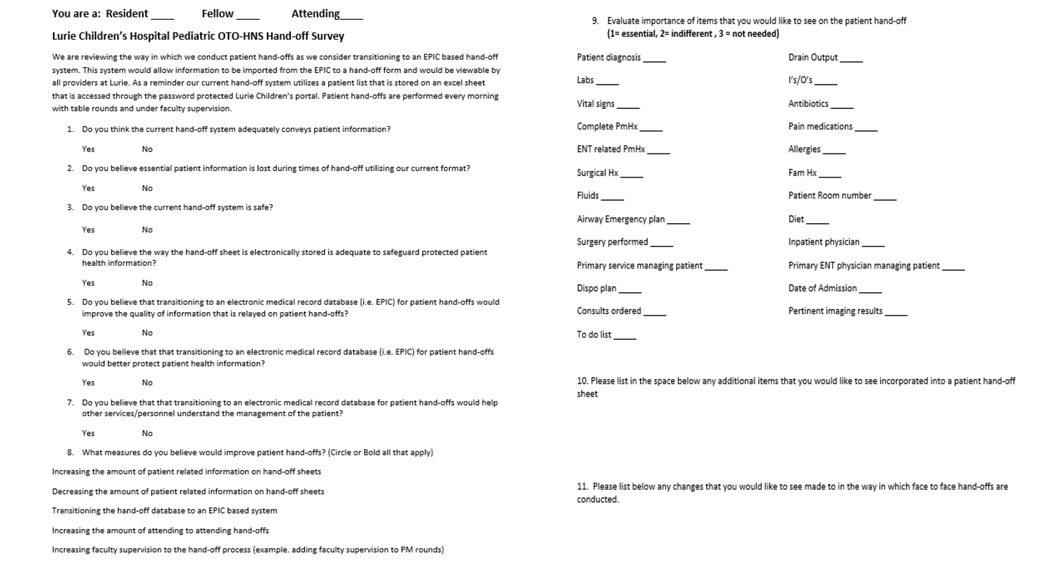
The previous manual spreadsheet used by our service was considered safe and effective. However, data on the spreadsheet was manually collected and entered and was not available to other service teams. By transitioning to a CHT generated by an EMR based system, human error and time gathering information were decreased. Our CHT was custom built with the EMR team and includes information generated from the survey deemed necessary for managing the pediatric otolaryngology service. Since transitioning to the EMR based CMT, handoffs have been subjectively equally effective and safe. In addition, since our patient list is part of the EMR, other services can easily access this information. Finally, from a trainee educational perspective, this type of EMR-based handoff system meets ACGME requirements for a handoff system that is easy to access and formally monitor.

The major drawback to the EMR system has been is that the list prints on multiple pages versus in comparison to the manual spreadsheet (7-10 pages vs. 1-2 pages). However, as technology advances and EMR becomes increasingly available on portable electronic devices this may no longer be an issue. (**Figure 2**)

In addition to using the CHT generated by EMR, we have started using a stationary bedside patient sheet for our intensive care unit handoffs. This sheet seen in **Figure 3** conveys important patient care information. We have found this especially useful for our pediatric aerodigestive patients and subjectively we feel it has greatly increased the safety and efficiency during handoffs.

Conclusions

The majority of respondents felt that our current, non-EMR based, hand-off system adequately conveyed information and safeguarded protected health information. One third of our group felt that we could improve the quality of information relayed by transitioning to an EMR based hand-off system and almost half believed this would help other services to better understand the management of the patient. When the group was queried we were able to identify at least ten items that were "essential" to our EMR based hand-off system design. A multi-disciplinary hand-off with well displayed standardized airway handoff sign in the patient room are essential for patients with critical airways.



You are a: Resident ____ Fellow ____ Attending____

Lurie Children's Hospital Pediatric OTO-HNS Hand-off Survey

We are reviewing the way in which we conduct patient hand-offs as we consider transitioning to an EPIC based hand-off system. This system would allow information to be imported from the EPIC to a hand-off form and would be viewable by all providers at Lurie. As a reminder our current hand-off system utilizes a patient list that is stored on an excel sheet that is accessed through the password protected Lurie Children's portal. Patient hand-offs are performed every morning with table rounds and under faculty supervision.

1. Do you think the current hand-off system adequately conveys patient information?
   Yes No
2. Do you believe essential patient information is lost during times of hand-off utilizing our current format?
   Yes No
3. Do you believe the current hand-off system is safe?
   Yes No
4. Do you believe the way the hand-off sheet is electronically stored is adequate to safeguard protected patient health information?
   Yes No
5. Do you believe that transitioning to an electronic medical record database (i.e. EPIC) for patient hand-offs would improve the quality of information that is relayed on patient hand-offs?
   Yes No
6. Do you believe that that transitioning to an electronic medical record database (i.e. EPIC) for patient hand-offs would better protect patient health information?
   Yes No
7. Do you believe that that transitioning to an electronic medical record database for patient hand-offs would help other services/personnel understand the management of the patient?
   Yes No
8. What measures do you believe would improve patient hand-offs? (Circle or Bold all that apply)

Increasing the amount of patient related information on hand-off sheets

Decreasing the amount of patient related information on hand-off sheets

Transitioning the hand-off database to an EPIC based system

Increasing the amount of attending to attending hand-offs

Increasing faculty supervision to the hand-off process (example. adding faculty supervision to PM rounds)

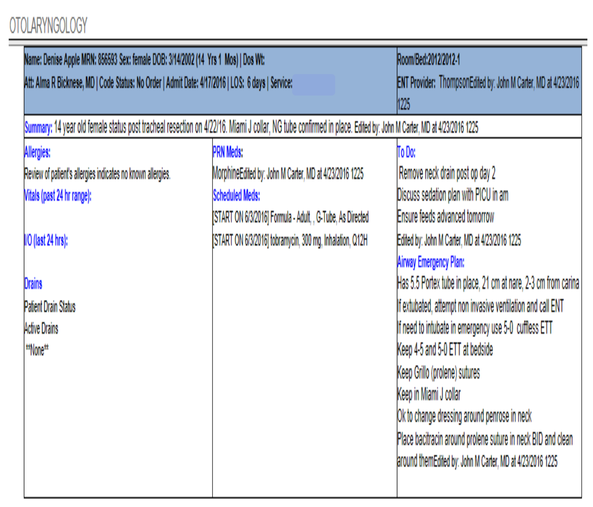
9. Evaluate importance of items that you would like to see on the patient hand-off
   (1= essential, 2= indifferent , 3 = not needed)

Patient diagnosis ____	Drain Output ____
Labs ____	I's/O's ____
Vital signs ____	Antibiotics ____
Complete PmHx ____	Pain medications ____
ENT related PmHx ____	Allergies ____
Surgical Hx ____	Fam Hx ____
Fluids ____	Patient Room number ____
Airway Emergency plan ____	Diet ____
Surgery performed ____	Inpatient physician ____
Primary service managing patient ____	Primary ENT physician managing patient ____
Dispo plan ____	Date of Admission ____
Consults ordered ____	Pertinent imaging results ____
To do list ____	

10. Please list in the space below any additional items that you would like to see incorporated into a patient hand-off sheet

11. Please list below any changes that you would like to see made to in the way in which face to face hand-offs are conducted.

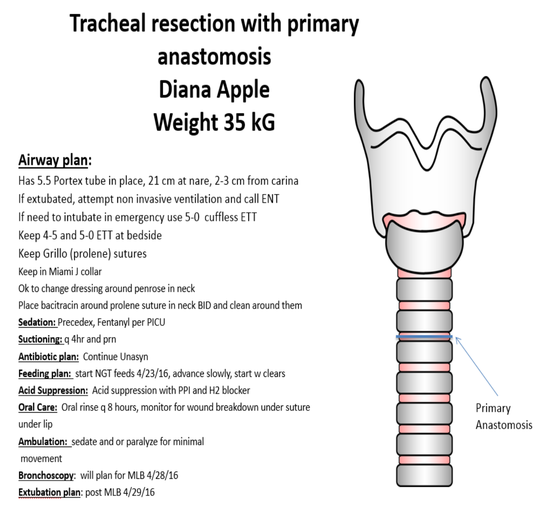
Figure 1. Questionnaire used to survey respondents



OTOLARYNGOLOGY

Name: Denise Apple MRN: 866883 Sex: female DOB: 3/14/2002 (14 Yrs 1 Mos) | Dos Wt: Att: Alma R Bicknese, MD | Code Status: No Order | Admit Date: 4/17/2016 | LOS: 6 days | Service:	Room/Bed:2012/2012-1 ENT Provider: ThompsonEdited by: John M Carter, MD at 4/23/2016 1225
Summary: 14 year old female status post tracheal resection on 4/22/16. Miami J collar, NG tube confirmed in place. Edited by: John M Carter, MD at 4/23/2016 1225	
Allergies: Review of patient's allergies indicates no known allergies. Vitals (past 24 hr range): I/O (last 24 hrs): Drains Patient Drain Status Active Drains "None"	PRN Meds: MorphineEdited by: John M Carter, MD at 4/23/2016 1225 Scheduled Meds: [START ON 6/3/2016] Formula - Adult, , G-Tube, As Directed [START ON 6/3/2016] tobramycin, 300 mg, Inhalation, Q12H	To Do: Remove neck drain post op day 2 Discuss sedation plan with PICU in am Ensure feeds advanced tomorrow Edited by: John M Carter, MD at 4/23/2016 1225 Airway Emergency Plan: Has 5.5 Portex tube in place, 21 cm at nare, 2-3 cm from carina If extubated, attempt non invasive ventilation and call ENT If need to intubate in emergency use 5-0 cuffless ETT Keep 4-5 and 5-0 ETT at bedside Keep Grillo (prolene) sutures Keep in Miami J collar Ok to change dressing around penrose in neck Place bacitracin around prolene suture in neck BID and clean around themEdited by: John M Carter, MD at 4/23/2016 1225

Figure 2. Example of an EMR based hand-off report



Tracheal resection with primary anastomosis
Diana Apple
Weight 35 kG

Airway plan:
Has 5.5 Portex tube in place, 21 cm at nare, 2-3 cm from carina
If extubated, attempt non invasive ventilation and call ENT
If need to intubate in emergency use 5-0 cuffless ETT
Keep 4-5 and 5-0 ETT at bedside
Keep Grillo (prolene) sutures
Keep in Miami J collar
Ok to change dressing around penrose in neck
Place bacitracin around prolene suture in neck BID and clean around them
Sedation: Precedex, Fentanyl per PICU
Suctioning: q 4hr and prn
Antibiotic plan: Continue Unasyn
Feeding plan: start NGT feeds 4/23/16, advance slowly, start w clears
Acid Suppression: Acid suppression with PPI and H2 blocker
Oral Care: Oral rinse q 8 hours, monitor for wound breakdown under suture under lip
Ambulation: sedate and or paralyze for minimal movement
Bronchoscopy: will plan for MLB 4/28/16
Extubation plan: post MLB 4/29/16

Primary Anastomosis

Figure 3. Example of bedside hand-off sheet

Contact

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References

1.Gardiner, T.M., A.P. Marshall, and B.M. Gillespie, *Clinical handover of the critically ill postoperative patient: an integrative review.* Aust Crit Care, 2015. **28**(4): p. 226-34.
2.Pucher, P.H., et al., *Effectiveness of interventions to improve patient handover in surgery: A systematic review.* Surgery, 2015. **158**(1): p. 85-95.
3.Davis, J., et al., *Evaluating Outcomes of Electronic Tools Supporting Physician Shift-to-Shift Handoffs: A Systematic Review.* J Grad Med Educ, 2015. **7**(2): p. 174-80.
4.Raval, M.V., et al., *Development and implementation of an electronic health record generated surgical handoff and rounding tool.* J Med Syst, 2015. **39**(2): p. 8.
5.Li, P., et al., *Review of computerized physician handoff tools for improving the quality of patient care.* J Hosp Med, 2013. **8**(8): p. 456-63.
6. Accreditation Council for Graduate Medical Education. ACGME Common Program requirements for 2016. https://www.acgme.org/Portals/0/PFAssets/ProgramRequirements/CPRs_07012016.pdf

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