The Direct Admission Conundrum

Balancing Value with Patient Safety

Pediatric Hospital Medicine 2017
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Disclosures

- Jeff Louie-Enova Illumination stock ownership
- Jeff Louie has documented that this presentation will not involve discussion of off-label, experimental or investigational use
- Marmet, Jacob, Mangone have documented no financial relationships to disclose or Conflicts of Interests (COIs) to resolve
Objectives

1. Describe the clinical variation that exists with direct admissions in various hospital settings and the underlying reasons why direct admissions are allowed or prohibited.
2. Identify the risks and benefits of direct admissions in terms of patient safety, referring provider satisfaction, patient/family satisfaction, appropriate utilization and cost of care.
3. Describe two direct admission processes in both an academic children’s hospital and in a community setting, which balance patient safety, cost of care, efficiency, patient/family satisfaction and referring provider satisfaction.

Patient Safety Story......
PHM 2017 ARS Instructions

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ARS polls

I am (mostly)?

1. An MD/DO with > 50% clinical practice
2. An APP with > 50% clinical practice
3. An RN or other ancillary staff roles, clinical >50%
4. Hold an administrative role(s) for >50% of my time

https://api.cvent.com/polling/v1/api/polls/sp-lku7oj
ARS polls

Where do I primarily work?
1. Academic hospital
2. Community hospital
3. Combined program
4. Most of my time is outpatient

https://api.cvent.com/polling/v1/api/polls/sp39c81x
ARS polls

I work in a hospital(s) that allows direct admissions?

1. YES, and there is a clinical triage process before admission to the floor
2. YES, but no clinical triage process exists. The accepting MD approves our direct admissions.
3. NO, all patients are admitted through the ED

https://api.cvent.com/polling/v1/api/polls/spm3slqa
ARS polls

I can recall a specific direct admission that went poorly at my institution?

1. Yes!!!
2. No, they’ve pretty much gone smoothly
3. No, because we don’t do direct admissions

https://api.cvent.com/polling/v1/api/polls/sprdbmaj
What we know about Direct Admissions

• Despite transitions to home garnering so much attention, very little literature/data exists on pediatric direct admissions
• Processes are entirely unique to each institution

Direct Admissions

• “a hospital admission without first receiving care in the hospital’s ED”
• 25% of all non elective pediatric hospital admissions
**Large retrospective DA study**

AHRQ 2009 Kids Inpatient Database

- Out 1,470,000 recorded non-elective admissions for kids <18 yo
  - 24.6% via direct admission
  - 1/2 attributable to:

<table>
<thead>
<tr>
<th>Reason for Hospitalization</th>
<th>Admissions, No.</th>
<th>Direct Admission Rate, %</th>
<th>Hospitals, No.</th>
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</thead>
<tbody>
<tr>
<td>Pneumonia</td>
<td>125,903</td>
<td>21.9</td>
<td>1037</td>
</tr>
<tr>
<td>Asthma</td>
<td>101,300</td>
<td>15.7</td>
<td>726</td>
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<tr>
<td>Bronchitis</td>
<td>98,997</td>
<td>25.0</td>
<td>763</td>
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<tr>
<td>Gastroenteritis</td>
<td>75,089</td>
<td>25.2</td>
<td>660</td>
</tr>
<tr>
<td>Appendectomy</td>
<td>67,555</td>
<td>8.9</td>
<td>590</td>
</tr>
<tr>
<td>Upper respiratory tract infection</td>
<td>64,431</td>
<td>7.6</td>
<td>515</td>
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<td>Colitis</td>
<td>55,065</td>
<td>23.7</td>
<td>428</td>
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<td>Seizures</td>
<td>42,429</td>
<td>20.0</td>
<td>289</td>
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<tr>
<td>Urinary tract infection</td>
<td>41,968</td>
<td>20.3</td>
<td>366</td>
</tr>
<tr>
<td>Septic shock</td>
<td>30,866</td>
<td>30.0</td>
<td>299</td>
</tr>
</tbody>
</table>

Leyenaar et al, JAMA Peds: May 2015; 169 (5)

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**Direct Admissions**

- Rates and outcomes of direct admission vary considerably across hospitals
- DA’s have decreased over time, associated with the growth of hospitalist programs
- Disparities in direct admission programs
  - More likely to have medical home, white race and private insurance

Leyenaar, Shieh, Lagu, Linenauer. JAMA Pediatrics May 2015 Volume 169, Number 5
Disparities
Large retrospective study, AHRQ 2009 Kids Inpatient Database

Leyenaar et al, JAMA Peds: May 2015; 169 (5)

Key differentiators:
- Ethnicity
- Insurance type

Balancing Risks and Benefits

Pros
- Cost of care
- Patient/family satisfaction
- ED throughput/overcrowding
- Referring provider satisfaction
- Less providers, exposures, improved coordination
- Bypassing an adult focused ED

Cons
- Patient Safety
- Variability in triage process
- Long transport times
- Provider productivity
- Appropriate placement/admission status
- Timely access to care/consultants
- Increased mortality?
Are Direct Admissions Safe?

- No differences in rates of unplanned ICU admissions within 12 hours of admission for ED admissions vs DA’s
  - Reese, Deakyne, Blanchard, Bajaj. Hospital Pediatrics, 2015, Vol 5, Issue 1, pg 27-34
- In children with pneumonia, no differences in rates of tx to ICU or readmissions between patients admitted from the ED vs DA
- Adults with sepsis found that direct admission was associated with increased mortality compared to ED admission
- Adults with sepsis with higher mortality with DA’s but not with pneumonia, cellulitis, or asthma

Variability in Admission Process

- Admission triage systems
  - Call centers, admitting officer of the day, etc
  - Certain diagnoses eligible for DA’s
- Registration/ Admission process
  - Clinical screening of patients
- ALL unscheduled admits admitted through the ED
- Needs in community vs tertiary settings
U of M Masonic Children’s Hospital
Emergency Department

• University Children’s Hospital
  – Tertiary/Quaternary care
    • 3800 annual hospital admissions
  – Catchment area
    • MSP Metro area
    • State of MN
    • Surrounding States
• Emergency Department (ED)
  – Annual volume ~ 15,000
  – Admission rate ~ 20%
    • > 70% of all UMMCH hospital admissions come through the ED
  – Single PEM Physician provider model
    • 10 PEM + 1 EM/Peds
    • 3 Pediatricians, 2nd Attending 5p – 1a every day
    • Resident physicians: Pediatrics + Emergency Med
Objectives

We developed a novel direct admission process, the Emergency Department Rapid Assessment of Patients intended for Inpatient Disposition (ED-RAPID)

• Ensure that the ED-RAPID process is feasible, safe and effective

Methods

• ED RAPID: Rapid Assessment of Patients intended for Inpatient Disposition (direct hospital admission)
• Inclusion criteria
  – Children referred from an outside hospital ward, ED or clinic
  – Children referred from within our system (subspecialty clinics or home)
    • Requested by admitting physician
• Exclusion criteria
  – Children to be admitted to a critical care unit (PICU or NICU)
  – Children admitted from U of M specialty clinics or home (unless requested)
Methods

- All patients who received an ED-RAPID evaluation prior to direct admission were identified and tracked via the Electronic Medical Record (EPIC®)
  - Demographic, clinical care, disposition and outcome data were abstracted
  - Data collected from March 1, 2013 to February 28, 2015

ED RAPID Patient Selection & Process
**Arranging an ED RAPID Bed**

- Referring MD calls UMMCH for admission

**Accepting MD:** Hospitalist/Specialist

- OR

**Emergency Department**

**Bed Placement Manager**

- Conference call:
  - Accepting MD +/- Referring MD
  - ED

**Emergency Department**

- Patient accepted:
  - MRN is generated
  - ETA is arranged

**Shared Mental Model**

**Patient arrives in ED for Rapid Eval**

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**ED-RAPID Evaluation**

Patient arrives (EMS or walk-in) at triage

- Vital signs and ABC assessment only
  - ED nurse and PEM Attending
    - Patient determined to be stable for Direct Hospital Admission **OR**
    - Patient stopped in ED for full evaluation, treatment and disposition

- RN and MD both use an ED-RAPID SmartPhrase for documentation in the EHR
**Outcome Measures**

• Primary
  – **Process Successes** - Children who received direct admission s/p ED RAPID and managed on the floor
  – **Process Failures** - Children who pass ED RAPID but no bed available for direct admission.
  – **ED Stops** - patients who received full ED evaluation s/p ED RAPID
    • **ED Saves** – ED Stops we are admitted to PICU after full ED evaluation and treatment

• Secondary
  – **ICU Bounces** - patients who received direct hospital floor admission after ED RAPID evaluation and were transferred to Critical Care within 12 hours
Figure 1. RAPID Evaluation Patient Flow

725 Patient charts abstracted

10/725 (1.4%) Excluded due to missing data

RAPID ED PROCESS
715 patients

Full ED Stop
24/715 (3.4%)

Transfer to Floor
691/715 (96.4%)

Floor bed not ready
14/715 (2.0%)
Process Failures

Full ED Stop for medical concerns
10/715 (1.4%)

Transferred to Critical Care
4/705 (0.6%)
ED SAVES

Stabilized and transferred to floor
6/705 (0.8%)
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RAPID ED PROCESS
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Transfer to Floor
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Floor to ICU w/i 12 hours
9/691 (1.3%)
ICU Bounces

Care on floor
682/691 (98.7%)
Process Success

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Figure 1. RAPID Evaluation Patient Flow
ED Stops (ED evaluated – Floor)

ED Stops 6/705 (0.8%) admitted to floor

- Sepsis Shock
  - 12 year-old with abdominal pain, met Sepsis criteria

- Respiratory Conditions
  - 3.5 year-old, s/p CHD surgery, increased O2
  - 1 month-old with RSV and increased work of breathing
  - 12 year-old, complex child with and pneumonia

- Gastroenteritis with on-going dehydration
  - 15 month old with AGE
  - 2 year-old with AGE and hypoglycemia

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725 Patient charts abstracted

- Full ED Stop 24/715 (3.4%)
- Floor bed not ready 14/715 (2.0%)
- Process Failures
- Full ED Stop for medical concerns 10/715 (1.4%)
- Floor to ICU w/i 12 hours 9/691 (1.3%)
- ICU Bounces
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- ED SAVES
- Stabilized and transferred to floor 6/705 (0.8%)

10/725 (1.4%) Excluded due to missing data

Transfer to Floor 691/715 (96.4%)

Floor to ICU w/i 12 hours 682/691 (98.7%)

Process Success
**ED Saves (ED evaluated – PICU)**

**ED Saves 4/705 (0.6%)**
- Cardiovascular instability (HR 200, rash, fussy)
  - 7 week-old with known meningitis
- Respiratory illnesses
  - 7 month-old with RSV (ED placed HFNC)
  - 5 month-old with RSV (ED placed HFNC)
  - 10 year-old, complex medical child, with respiratory distress and 80% on RA. Placed on O2, ED CXR = aspiration pneumonia

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**Figure 1. RAPID Evaluation Patient Flow**

- 725 Patient charts abstracted
- 10/725 (1.4%) Excluded due to missing data
- RAPID ED PROCESS 715 patients
  - Transfer to Floor 691/715 (96.4%)
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  - Process Failures
  - Full ED Stop for medical concerns 10/715 (1.4%)
  - Transferred to Critical Care 4/705 (0.6%) **ED SAVES**
  - Stabilized and transferred to floor 6/705 (0.8%)
  - Floor to ICU w/i 12 hours 9/691 (1.3%) **ICU Bounces**
  - Care on floor 682/691 (98.7%) **Process Success**
ED Bounces (Floor – PICU)

ICU Bounces 9/691 (1.3%) to PICU
- Respiratory illnesses
  - Croup
    • 3 year-old PICU LOS = 24 hours, no ETT intubation
  - Bronchiolitis – 6 patients (ages 1-25 months)
    • Mean PICU LOS = 36 hours, no ETT intubation
- Neurologic illnesses
  - Liver failure and altered mental status
    • 6 year-old with liver failure and altered mental status
  - Renal transplant with left-sided weakness
    • 12 year-old with stroke (> 12 hours old)

Summary

What we have learned
- Patients at risk for ED Saves or ICU Bounces
  - Younger age
  - Respiratory conditions
  - Complex medical conditions
  - Long transport times
Limitations

• Retrospective design
  – Missed eligibles
    • Only 1.4% of charts were incomplete
    • Some patients may have passed by the ED and presented directly to the floor
• Did not identify patients for whom full ED evaluation will result in discharge to home
• Generalizability
  – Results from our setting may not be reproducible elsewhere
About Fairview Ridges
Burnsville, MN

• 150 bed community hospital
  ▪ 15 licensed pediatric beds
  ▪ Level III NICU
  ▪ No PICU (UMMCH is nearest PICU, 19 miles away)
• >50,000 total ER encounters per year
  ▪ >12,000 pediatric ER encounters per year
• ~8,200 adult admissions per year
  ▪ ~550 pediatric admissions per year

Community Hospitalist Coverage

• One hospitalist on at a time
• Two shifts per 24 hours
  – 7a to 7p & 7p to 7a
  – 7 days on, 7 days off (~26 weeks per year)
• One common pager number
• All general pediatrics admitted to hospital
• Newborn nursery
• Level 2 NICU
• ER consults
• Phone consults from community providers
Community Hospital DA Process

• Standardize a process where there would be no adverse events on transfer of care, including:
  – Rapid response/Clinical Assessment
  – Code Blue
  – Emergent transfer of the patient to a higher level of care within 12 hours and 24 hours of the direct admission.

Community Hospital DA Process

• Process involves partnership with emergency room triage team.
• All patient’s being referred for direct admission report directly to emergency room triage station.
• Upon arrival, triage nurse collects vitals and notifies the pediatric hospitalist that patient has arrived.
• Pediatric hospitalist meets patient in triage room and provides quick assessment of patient.
Community Hospital DA Process

- After brief assessment, pediatric hospitalist personally escorts patient to pediatric unit for formal admission work up if there are no emergent concerns.

- **If pediatric hospitalist or triage team notes any emergent concerns (ie: impending respiratory failure, shock, severely alter mental status, etc), patient is transferred to emergency room for stabilization/ intervention.**

Direct Admission Process

1. Referring physician from outside center contacts admitting physician (Hospitalists carry one common pager number)
2. Admitting physician collects all pertinent admission information and directs referring physician to send patient to ER triage area
3. Admitting physician notifies nursing supervisor, pediatric unit and ER triage of direct admission
4. Nursing supervisor registers patient for bed assignment
5. Pediatric unit prepares room
6. Once patient arrives, ER triage nurse obtains basic vitals and notifies admitting physician
7. Admitting physician meets patient in ER triage and performs a basic assessment
8. If ER triage (when collecting vitals) or admitting physician (during brief assessment) feels that patient is unstable, the patient will be redirected through the ER for stabilization
9. If ER triage (when collecting vitals) or admitting physician (during brief assessment) feels that patient is stable, the admitting physician will personally escort patient to the pediatric unit for formal admission and evaluation
2 Year Review

- 1,178 Pediatric admissions
- 150 completed the direct admission process (12%)
- 8 patients were redirected in triage to ER instead of completing direct admission process (5%)
- 1 patient was sent home from triage without admission
- ZERO (0%) of our patients required emergent transfer to higher care center (Pediatric Intensive Care Unit) within both 12 hours and 24 hours of their admission.

Community Hospital DA Process

Success factors/ Benefits

- Only one hospitalist on at a time
- Relatively manageable census and work flow to accommodate process
- Great partnership with ER and ER Triage
- Convenient place to meet patients
- Allows for rapid assessment of patient stability in an area of hospital with most resources
- One number to “market” to community
- Concierge effect, being able to “greet” patients and families at front door
  - High patient and referring provider satisfaction
Community Hospital DA Process
Limitations

• Only one hospitalist on at a time
• Covering multiple areas in the hospital
• Referring bias
  – Really sick kids are going to be referred to larger centers with PICU or directly to ER
• What happens when two or more direct admissions are requested at one time?
• Process does not accommodate transfers via ambulance

JORDAN

“You caught a virus from your computer and we had to erase your brain. I hope you’ve got a back-up copy!”
Yes, but safeguards in place, and requires ACTIVE management & coordination
Summary: Benefits

With safety comes increased confidence of care team

• Eliminate ED stay
• Streamline communication
Summary: Benefits

Standardized process: for the right patients

Summary: Benefits

Current state affairs: NO! Opportunity for improvement. But might be related to decreased PCP access for some demographics
Summary: Benefits

Absolutely preferred by families to skip ED crowding, waits, costs.

Summary: Benefits

- Win-Win:
  - Safe
  - Reduce ED crowding and improves throughput
  - Satisfier for both patients/families and referring providers
  - Cost savings: individual, system
- Improved working relationships & collaboration with ED/Hospitalists
Referring clinician identifies patient requiring admission

Contacts ED

ED recognizes patient meet direct admission criteria

Contacts hospitalist

(Ensures bed availability)

Patient arrives: quick assessment

Patient admitted to unit
MOC2 ARS Quiz question

According to evidence on direct admissions, which of the following is a **false** statement?

1. Direct admissions are common, accounting for ~1/4 of all pediatric admissions.
2. Direct admissions are noted to be equally distributed across genders, ethnicities and socioeconomic groups.
3. Respiratory problems represent the most common reason for a child to be directly admitted.
4. Studies exist demonstrating the general safety of pediatric direct admissions.

https://api.cvent.com/polling/v1/api/polls/sp750nd1

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Please enter the URL below:

https://api.cvent.com/polling/v1/api/polls/sp750nd1

Note: Many popular websites allow secure access. Please click on the preview button to ensure the web page is accessible.
Summary
Lessons Learned

• Greater risk of challenges with DA:
  – Age < 6 m.o.
  – Chief problem is a respiratory illness
  – Coming from longer distance away

• Patient should have full ED eval/mgmt if:
  – Need a lab draw prior to admission
  – Need IV access or IVF within ~ 4 hrs of admission
  – Need acute care/consultation within ~2-4 hrs from admission

• Needs in community setting and academic setting are different

Q & A / Discussion

Abe Jacob
Jeff Louie
Joe Mangone
Jordan Marmet
References


