HHS Public Access

Author manuscript

J Pediatr. Author manuscript; available in PMC 2019 July 01.

Published in final edited form as:

J Pediatr. 2018 July ; 198: 273–278.e7. doi:10.1016/j.jpeds.2018.03.007.

Multi-stakeholder Informed Guidelines for Direct Admission of Children to Hospital

JoAnna K. Leyenaar, MD, MPH, MSc[1,2], **Megan Shevenell, BA, MS**[1,3], **Paul A. Rizzo, BA**[4], **Vanessa L. Hill, MD, MSc**[5], and **Peter K. Lindenauer, MD, MSc**[6,7]

[1]Department of Pediatrics & The Dartmouth Institute For Health Policy & Clinical Practice, Geisel School of Medicine at Dartmouth

[2]Graduate Program in Clinical and Translational Science, Sackler School of Graduate Biomedical Sciences, Tufts University, Boston, MA 02111, USA

[3]Behavioral Psychopharmacology Research Laboratory, McLean Hospital, Belmont, MA

[4]University of Massachusetts Medical School, Worcester, MA

[5]Department of Pediatrics, Baylor College of Medicine, San Antonio, TX

[6]Instititute for Healthcare Delivery and Population Science and Department of Medicine, University of Massachusetts Medical School – Baystate 3601 Main Street, Springfield, MA, 01199

[7]Department of Quantitative Health Sciences, University of Massachusetts Medical School Worcester, MA

Abstract

Objectives—To develop pediatric direct admission guidelines and prioritize outcomes to evaluate the safety and effectiveness of hospital admission processes.

Study design—We conducted deliberative discussions at 1 children's hospital and 2 community hospitals, engaging parents of hospitalized children and inpatient, outpatient, and ED physicians and nurses to identify shared and dissenting perspectives regarding direct admission processes and outcomes. Discussions were audio-recorded, professionally transcribed, and analyzed using a general inductive approach. We then convened a national panel to prioritize guideline components and outcome measures using a RAND/UCLA Modified Delphi approach.

Results—48 stakeholders participated in 6 deliberative discussions. Emergent themes related to effective multi-stakeholder communication, resources needed for high quality direct admissions, written direct admission guidelines, including criteria to identify children appropriate for and inappropriate for direct admission; and families' needs. Building on these themes, Delphi panelists

Address correspondence to: Dr. JoAnna Leyenaar, Department of Pediatrics & The Dartmouth Institute for Health Policy and Clinical Practice, Dartmouth-Hitchcock Medical Center, 1 Medical Center Way, Lebanon, NH, 03766, JoAnna.K.Leyenaar@hitchcock.org, 603-653-0855.

The authors declare no conflicts of interest.

endorsed 71 guideline components as both appropriate and necessary at children's hospitals and community hospitals and 13 outcomes to evaluate hospital admission systems. Guideline components include: (i) pre-admission communication, (ii) written guidelines, (iii) hospital resources to optimize direct admission processes, (iv) special considerations for pediatric populations that may be at particular risk of nosocomial infection and/or stress in EDs, (v) communication with families referred for direct admission, and (vi) quality reviews to evaluate admission systems.

Conclusions—These direct admission guidelines can be adapted by hospitals and health systems to inform hospital admission policies and protocols. Multi-stakeholder engagement in evaluation of hospital admission processes may improve transitions of care and health system integration.

Keywords

hospitalization; children; portal of entry; care coordination

One-quarter of unplanned pediatric hospitalizations in the United States (US) begin as direct admissions, defined as admission to hospital without first receiving care in the hospital's emergency department (ED).[1] Compared with hospital admission originating in the ED, pediatric direct admission has been associated with less diagnostic testing and lower hospitalization costs, with no significant differences in rates of adverse outcomes including readmission and transfer for intensive care.[1–3] Additional potential benefits of direct admission include decreased ED crowding, decreased risk of nosocomial infection, and greater care coordination between referring and accepting healthcare providers.[4,5] A national survey of inpatient pediatric medical directors found that 50% believed more children should be admitted directly, yet less than one-third of hospitals had direct admission policies or guidelines.[5]

Although increasing rates of direct admission may have benefits for children, healthcare providers and healthcare systems, research conducted in adult populations raises concerns about the safety and quality of this hospital admission approach. Among adults admitted with time-sensitive conditions including acute myocardial infarction and sepsis, direct admission has been associated with higher mortality than admission through EDs (differences not observed in adults with pneumonia, asthma or cellulitis).[6,7] Although similar findings have not emerged in the small number of pediatric studies performed to date, pediatricians have also raised concerns about potential delays in management and treatment associated with direct admission.[2,3,5] The development and application of direct admission guidelines, coupled with institutional evaluations of direct admission processes, may improve the quality and safety of this admission approach.

Our objectives were to engage the multiple stakeholders involved in direct admission processes to develop pediatric direct admission guidelines for unscheduled hospital admissions, and to define and prioritize outcomes that could be used to evaluate the safety and effectiveness of hospital admission processes.

Study Design

Our guideline development and outcome prioritization process involved application of deliberative methods to identify direct admission processes and outcomes most valued by diverse stakeholders, and a RAND/UCLA Modified Delphi process to prioritize direct admission guideline components and outcome measures. We applied these methods sequentially, using deliberative methods to generate rich data regarding stakeholders shared and dissenting perspectives, and Delphi methods to engage a national panel of experts to prioritize guideline components. Dartmouth College, Tufts Medical Center, Lawrence General Hospital, and Lowell General Hospital Institutional Review Boards provided study approval.

We conducted deliberative discussions at one children's hospital and two general community hospitals in June 2016, applying methods rooted in deliberative democratic theory, to learn about stakeholders' respective experiences with direct admissions and discuss how to optimize this admission approach, taking into consideration others' perspectives and values.[8,9] Our discussions were structured similarly to focus groups, but, consistent with deliberative methods, began with an educational component summarizing current direct admission processes and existing literature about the strengths and limitations of this admission approach. This educational component was followed by facilitated discussions in mixed stakeholder groups to encourage debate and identify shared and dissenting perspectives.[9–11] Our discussions focused on four areas: (i) diagnoses and pediatric populations that may benefit or be at risk from direct admissions; (ii) hospital and clinic settings and infrastructure that may impact direct admissions; (iii) logistical challenges, safety concerns and methods to address these; and (iv) quality and safety outcomes. Stakeholders included: (i) parents of hospitalized children, (ii) inpatient nurses, (iii) hospitalists, (iv) pediatric primary care providers (PCPs), (v) pediatric specialists, (vi) ED physicians, (vii) outpatient nurses, (viii) resident physicians, and (ix) an insurance company representative. Stakeholders were purposefully sampled to reflect diverse pediatric health conditions, practice types and hospital environments.

Six mixed stakeholder groups were convened at three hospitals, with each discussion facilitated by two trained facilitators. Approximately two weeks prior to discussions, all stakeholders were provided with a summary of published studies regarding direct admission quality and safety. A semi-structured discussion guide was developed by the research team and pilot tested with parents and healthcare providers, not included in the final sample, to ensure that questions were clear and prompted discussion. Verbal consent was received from all stakeholders prior to initiation. Following each facilitated discussion, consistent with established deliberative methods, stakeholders were asked to suggest outcomes that should be used to evaluate hospital admission processes, and then to vote for three outcomes they considered most relevant. These outcomes were selected from the full list of potential outcomes generated by participants during the deliberative discussions, and therefore varied somewhat across discussion groups.

All discussions were audio-recorded with permission and professionally transcribed with identifiers removed. Following verification of transcript accuracy, transcripts were uploaded

to Dedoose, a mixed-methods data analysis program, and analyzed to identify emergent themes regarding direct admission processes and outcomes using a general inductive approach.[12] Transcripts were coded by two members of the research team with areas of disagreement resolved via discussion. Edits to the coding framework and codebook definitions were made as needed to support consistency with code application. Following coding, similar codes were grouped as themes, and similar themes were grouped as domains.

Delphi Methods

Panelists—We applied the RAND/UCLA modified Delphi approach to prioritize direct admission processes and outcomes for inclusion in a direct admission guideline.[13] Consistent with RAND/UCLA Appropriateness Methods (RAM), we convened a panel of 9 panelists, nominated via national organizations including Family Voices, the Health Care Delivery Committee of the Academic Pediatric Association, the Society of Pediatric Nurses, and the American Academy of Pediatrics Section on Hospital Medicine, Council on Pediatric Subspecialties, and Committee on Child Health Financing.[13] Panelists included a parent of a child with several past hospitalizations, an inpatient pediatric nurse, a PCP working in a community practice, a PCP working in a children's hospital-affiliated practice, an ED physician, a community pediatric hospitalist, a tertiary care pediatric hospitalist, a pediatric pulmonologist, and a pediatric surgeon, representing 8 health systems nationally. These nine panelists completed two electronic surveys and participated in two conference calls as described below.

Survey development—First-round Delphi survey items were developed based on review of the literature and the above-described deliberative methods. Specifically, transcripts from the deliberative discussions were reviewed by two analysts to identify all excerpts that could be operationalized as guideline components or outcomes. The survey was then pilot tested with healthcare providers and parents, not included in the final sample, to ensure that the items were clear and comprehensive. Prior to data collection, Delphi panelists were also asked to review the survey for clarity and comprehensiveness. The first-round survey included 103 items related to: (i) pre-admission communication, (ii) written guideline components, (iii) hospital resources, (iv) populations best-suited to and inappropriate for direct admission, (v) communication with families, and (vi) direct admission outcomes. Panelists were asked to focus on unplanned direct admissions that involved a referral of a patient from an outpatient healthcare provider to an inpatient healthcare provider, excluding intensive care.

Panelists were asked to rate the appropriateness and necessity of each item on a 9-point Likert scale, considering each item separately for application at children's hospitals and community hospitals. Children's hospitals were defined as hospitals where the majority of services are designed for children (freestanding or "nested" within larger hospitals). Community hospitals were defined as general, non-children's hospitals. Higher ratings indicated greater perceived appropriateness and necessity, and participants were encouraged to use the full range of the scale, considering ratings of 1-3 as inappropriate/unnecessary, ratings of 4-6 as uncertain or equivocal, and ratings of 7-9 as clearly appropriate/necessary.[13] Consistent with RAM, appropriateness was defined as having an expected benefit that

exceeded the expected negative consequences by a sufficiently wide margin that the item/intervention was worth doing, regardless of cost. Necessity was defined by four criteria: (i) benefits exceeded risks and costs by a sufficient margin to make the item worthwhile; (ii) it would be improper to omit the item; (iii) reasonable chance that the item would result in benefits; and (iv) the magnitude of the expected benefit is not small.[13] In addition to the quantitative ratings, participants were asked to provide free-text comments to justify their responses.

Implementation—Implementation of this Delphi process began with a conference call to discuss the approach to survey completion, definitions, and to clarify any survey items as needed. The first round survey was subsequently completed independently and asynchronously by panelists. Up to three email reminders over a 6-week period were sent to encourage responses.

Following receipt of responses, each survey item was categorized as appropriate, of uncertain appropriateness, or inappropriate, and necessary, of uncertain necessity, or unnecessary for children's hospitals and community hospitals using RAM statistical methods as detailed in the eMethods (online). Personalized reports were then provided to each panelist illustrating the distribution of responses, a reminder of their own first-round responses, and a summary of free-text responses.

Following distribution of these reports, we hosted a second conference call for panelists to discuss the item ratings from the first round. Each panelist was encouraged to share her/his perspective and suggest modifications to item phrasing if they believed items were unclear or suboptimally worded.

In the second round of data collections, panelists were asked to re-rate the appropriateness and necessity of items rated as uncertain in the first round, as well as newly developed items based on first-round feedback. Items previously rated with high levels of agreement on the first round were not re-rated unless they had been rephrased based on conference call feedback. To incentivize participation, gift cards were provided to panelists for each round of data collection they completed.

Results

Deliberative Methods

A total of 48 stakeholders joined six deliberative discussions at three hospitals, with each discussion group comprised of 6-10 participants (Table I). These sample sizes are consistent with the recommendations of qualitative methodologists who advise that focus groups be comprised of 5-10 participants, with 4-6 focus groups conducted to attain maximum response variation and thematic saturation.[14,15] Each deliberative discussion included stakeholders from one hospital system/referral network and at least four stakeholder groups (ie, nurses, outpatient physicians, hospitalists and parents).

Emergent domains and associated themes are summarized in Table 2. These domains include: (i) effective multi-stakeholder communication; (ii) resources needed for high quality

direct admissions; (iii) written direct admission guidelines, including criteria to identify children appropriate for and inappropriate for direct admission; and (iv) families' preferences and needs. We observed considerable deliberation between referring and accepting healthcare providers regarding communication and transition procedures at the time of hospital admission request. Outpatient-based healthcare providers emphasized their desire to avoid ED utilization, both because they were evaluated in third party payor contracting for outcomes including ED utilization, and because they did not think ED utilization was in their patients' best interests. They also described their desire for inpatient-based physicians and nurses to respect their assessment of patients' need for hospitalization, based on their longitudinal relationships with patients and their efforts to optimize outpatient clinical management. In contrast, inpatient healthcare providers placed a high value on ensuring patient safety, appropriate use of hospital resources, and autonomy to make inpatient-based clinical management decisions.

Stakeholders suggested and discussed 27 outcomes to evaluate pediatric direct admission systems of care, summarized, with representative quotations (Table 3; available at www.jpeds.com). The most frequently endorsed outcomes included: (i) unplanned transfer to a higher level of care, (ii) family self-reported experience of care, (iii) delays in care, including time required from arrival on the hospital floor to initial inpatient clinical management, and time required for referring providers to connect via phone with accepting providers, (iv) healthcare costs, and (v) length of hospital stay. During deliberative discussions, PCPs described the importance of balancing patient safety outcomes with improved efficiency afforded by direct admission. Inpatient-based healthcare providers advocated for clinical outcomes, including avoidance of rapid-response calls and unexpected transfers to higher level of care.

Delphi Methods

All nine panelists completed both rounds of data collection, reflecting a 100% response rate. In the first round of data collection, panelists rated 83 of 103 items as appropriate and necessary at both children's hospitals and community hospitals. Items rated as having uncertain appropriateness and/or necessity at either hospital type were discussed via conference call; 12 items rated as appropriate and necessary in the first round were also discussed at the request of panelists. Several additions and revisions to items were proposed during the conference call, resulting in a 32 item second-round survey.

In the second round of data collection 8 of 32 items were rated as appropriate and necessary, with no differences in recommendations for children's hospitals and community hospitals. In aggregate, across both rounds of data collection, 71 guideline components (summarized from 91 survey items) were rated as appropriate and necessary; these are shown in full in the eResults (online only), and summarized in Table 4. Guideline components include: (i) pre-admission communication, (ii) written guidelines, (iii) hospital resources to optimize direct admission processes, (iv) special considerations for pediatric populations that may be at particular risk of nosocomial infection and/or stress in EDs, (v) communication with families referred for direct admission, and (vi) quality reviews to evaluate admission systems. In addition, 13 outcomes were prioritized to evaluate hospital admission processes

and outcomes (Table 4). There were no differences in the guideline components rated as appropriate and necessary for children's hospitals and community hospitals. Items rated as appropriate but not necessary are summarized in Table 5 (available at www.jpeds.com).

Discussion

We applied two complementary methods to engage diverse stakeholders in pediatric direct admission processes, developing guidelines to improve this admission approach and to evaluate the impact of direct admissions on quality, safety, and patient experience. Pairing of deliberative and Delphi methods allowed us to develop an in-depth understanding of stakeholders' perspectives and to generate recommendations applicable to both children's and community hospitals.

A national survey of pediatric medical directors found that 97% of hospitals accept pediatric direct admissions, yet the majority reported inconsistent approaches to care and low levels of satisfaction with current direct admission processes.[5] Our direct admission guidelines can be adapted for use by hospitals and health systems to standardize admission processes, prioritize populations best suited to this admission approach, and establish necessary infrastructure and resources to provide safe, patient-centered care. Unlike some past outcome prioritization studies that have failed to reach consensus across stakeholder groups, our research process prioritized quality measures to evaluate direct admission processes and outcomes;[16] routine evaluation of these measures by multidisciplinary healthcare providers was advocated by all stakeholder groups. As hospitalists increasingly provide hospital-based care for children and primary and inpatient care are increasingly siloed, such multi-stakeholder evaluation processes are particularly important. Analogous to national efforts to evaluate and improve hospital-to-home transitions, efforts to improve transitions *into* the hospital are important to achieve health system integration.[17–21]

This research also provides valuable information about how different stakeholder groups differentially conceptualize high quality pediatric healthcare across the care continuum. PCPs advocated for efficient transitions into the hospital, facilitated by clear and consistent communication systems and respect for their knowledge of their patients' healthcare needs. Correspondingly, they described ED assessment and management prior to hospitalization as duplicative and unnecessary. These perspectives were shared by our parent participants and are consistent with several principles of the patient-centered medical home, including continuous, comprehensive, patient-centered care.[22] In contrast, hospital-based physicians and nurses advocated for autonomy in their assessment of a patient's need for hospitalization and prioritized patient safety and stewardship of hospital resources, describing hospital admission processes beginning in the ED as a means to achieve this. Understanding such differences in the perspectives of inpatient- and outpatient-based healthcare providers is important to inform pediatric direct admission processes, as well as the many other healthcare processes that span settings and healthcare teams.

Our results should be interpreted in light of this study's strengths and limitations. Our deliberative discussions were limited to three health systems within the greater Boston region, which may limit the transferability of our results. Moderator bias and response bias

are other potential limitations of deliberative methods, which we made efforts to minimize in our facilitator training. With respect to our Delphi process, we acknowledge that the evidence-base upon which our guidelines are based is limited to a small number of retrospective studies and expert opinion. In addition, because our Delphi panel was limited to nine panelists, some perspectives may not have been represented. We were surprised that panelists did not endorse different guidelines for children's hospitals and community hospitals; this may be related to the fact that most of our panelists had primary affiliations at children's hospitals.

Our use of Delphi methods following deliberative discussions mitigates several limitations of using one research method alone. For example, to mitigate the geographic limitation of our deliberative discussion, we sough national representativeness in our Delphi panel. Similarly, Delphi methods are designed to reduce response bias because panelists submit their responses anonymously. The outcome of Delphi processes is highly dependent on the data input into the first round, and Delphi processes have been criticized for a lack of transparency regarding this source data.[23,24] By using the results of our deliberative discussions to inform our Delphi data collection instrument, we addressed this criticism and kept multi-stakeholder engagement central to our approach.

Despite differing perspectives and priorities among stakeholders in hospital admission processes, our Delphi process resulted in a comprehensive set of direct admission guidelines applicable to both children's hospitals and community hospitals. Important next steps include adaptation of these guidelines to align with the resources and contexts of different hospitals and health systems, as well as evaluation of outcomes associated with guideline implementation. Multi-site studies to determine safety and effectiveness of direct admission for diverse pediatric conditions will yield valuable data to further inform the populations and settings most appropriate for this hospital admission approach.

Acknowledgments

We thank the stakeholders who participated in our deliberative discussions, as well as our 9 Delphi panelists: Mark A. Brown, MD, Professor, Pediatrics-Pulmonary Medicine, Children's Hospital Colorado, CO; Michael C. DiStefano, MD, Associate Professor, Pediatrics-Emergency Medicine, Children's Hospital Colorado, CO; Ms Cindy Dixon, MSN, RN, CPN, Nurse Manager, Dayton Children's Hospital, OH; Matthew Garber, MD, Professor of Pediatrics-Pediatric Hospital Medicine, University of Florida; Carl-Christian Jackson, MD, Assistant Professor, Surgery-Pediatric surgery, Tufts University School of Medicine, MA; Verné Rochford, MD, Primary Care Pediatrician, Generations of Children-Pediatrics, Fredericksburg, VA; Ms Cathy Stevens, MEd, Parent Participant, Greenville, SC; Jeremy Yardley, MD, Pediatric Hospitalist, Eastern Maine Medical Center, ME.

Supported by the National Center for Advancing Translational Sciences, National Institutes of Health (UL1 TR001064). J.L. was supported by the Agency for Healthcare Research and Quality (K08HS024133). P.L. was supported by the National Heart, Lung, and Blood Institute (K24HL132008). The content is solely the responsibility of the authors and does not necessarily represent the official views of AHRQ or the NIH.

Abbreviations

ED	emergency department
PCP	primary care provider
RAM	RAND Appropriateness Methods

US United States

References

1. Leyenaar J, Shieh M-S, Lagu T, Pekow PS, Lindenauer PK. Direct admission to hospitals among children in the United States. JAMA Pediatr. 2015; 169(5):500–502. [PubMed: 25774452]
2. Leyenaar JK, Shieh M, Lagu T, Pekow PS, Lindenauer PK. Variation and outcomes associated with direct admission among children with pneumonia in the United States. JAMA Pediatr. 2014; 168(9): 829–836. [PubMed: 25003562]
3. Reese J, Deakyne S, Blanchard A, Bajaj L. Rate of preventable early unplanned intensive care unit transfer for direct admissions and emergency department admissions. Hosp Pediatr. 2015; 5(1):27–34. [PubMed: 25554756]
4. Leyenaar JK, Lagu T, Lindenauer PK. Direct Admission to the Hospital: An Alternative Approach to Hospitalization. J Hosp Med. 2016; 11(4):303–305. [PubMed: 26588666]
5. Leyenaar JK, O'Brien ER, Malkani N, Lagu T, Lindenauer PK. Direct Admission to Hospital: A Mixed Methods Survey of Pediatric Practices, Benefits, and Challenges. Acad Pediatr. Aug.2015 : 1–8.
6. Powell ES, Khare RK, Courtney DM, Feinglass J. Lower mortality in sepsis patients admitted through the ED vs direct admission. Am J Emerg Med. 2012; 30(3):432–439. [PubMed: 21354751]
7. Kocher KE, Dimick JB, Nallamothu BK. Changes in the source of unscheduled hospitalizations in the United States. Med Care. 2013; 51(8):689–698. [PubMed: 23752257]
8. Agency for Healthcare Research and Quality. Using deliberative methods to engage patients, consumers and the public. Community Forum. Dec, 2011. http://effectivehealthcare.ahrq.gov/tasks/sites/ehc/assets/File/CF_deliberative_methods_webinar.pdf. Acces
9. Abelson J, Forest P-G, Eyles J, Smith P, Martin E, Gauvin F-P. Deliberations about deliberative methods: issues in the design and evaluation of public participation processes. Soc Sci Med. 2003; 57(2):239–251. [PubMed: 12765705]
10. Watt AM, Hiller JE, Braunack-Mayer AJ, Moss JR, Buchan H, Wale J, Riitano DE, Hodgetts K, Street JM, Elshaug AG. The ASTUTE Health study protocol: deliberative stakeholder engagements to inform implementation approaches to healthcare disinvestment. Implement Sci. 2012; 7(1):101. [PubMed: 23088222]
11. Rychetnik L, Carter SM, Abelson J, Thornton H, Barratt A, Entwistle Va, Mackenzie G, Salkeld G, Glasziou P. Enhancing citizen engagement in cancer screening through deliberative democracy. J Natl Cancer Inst. 2013; 105(6):380–386. [PubMed: 23378639]
12. Sofaer S. Qualitative Methods: What Are They and Why Use Them? Health Serv Res. 1999; 34(5): 1101–1118. [PubMed: 10591275]
13. Fitch K, Bernstein SJ, Mcdonnell J, Kahan JP. The RAND/UCLA Appropriateness Method User ' S Manual. 2000
14. Kuzel A. Sampling in qualitative inquiry. Doing Qualitative Research: Research Methods for Primary Care. 1992:31–44.
15. Carlsen B, Glenton C. What about N? A methodological study of sample-size reporting in focus group studies. BMC Med Res Methodol. 2011; 11:26. [PubMed: 21396104]
16. Gagliardi AR, Fraser N, Wright FC, Lemieuxcharles L, Davis D. Fostering knowledge exchange between researchers and decision-makers: Exploring the effectiveness of a mixed-methods approach. Health Policy (New York). 2008; 86:53–63.
17. Snow V, Beck D, Budnitz T, Miller DC, Potter J, Wears RL, Weiss KB, Williams MV. Transitions of Care Consensus policy statement: American College of Physicians, Society of General Internal Medicine, Society of Hospital Medicine, American Geriatrics Society, American College Of Emergency Physicians, and Society for Academic Emergency M. J Hosp Med. 2009; 4(6):364–370. [PubMed: 19479781]
18. Centers for Medicare and Medicaid Services. Readmissions Reductions Program. Available at: http://www.cms.gov/Medicare/Medicare-Fee-for-Servi

19. Kripalani S, Jackson AT, Schnipper JL, Coleman Ea. Promoting effective transitions of care at hospital discharge: A review of key issues for hospitalists. J Hosp Med. 2007; 2(5):314–323. [PubMed: 17935242]

20. Health Policy Brief: Care Transitions. Health Affairs. Sep 13.2012

21. Coleman EA, Mahoney EPC. Assessing the quality of preparation for post hospital care from the patient' s perspective: the care transitions measure. Med Care. 2005; 433:246–255.

22. Academy A. American Academy of Family Physicians, American Academy of Pediatrics American College of Physicians, American Osteopathic Association. Joint Principles of the Patient-Centered Medical Home. Mar.2007 :1–3.

23. Boulkedid R, Abdoul H, Loustau M, Sibony O, Alberti C. Using and reporting the Delphi method for selecting healthcare quality indicators: a systematic review. PLoS One. 2011; 6(6):e20476. [PubMed: 21694759]

24. Sinha IP, Smyth RL, Williamson PR. Using the Delphi technique to determine which outcomes to measure in clinical trials: recommendations for the future based on a systematic review of existing studies. PLoS Med. 2011; 8(1):e1000393. [PubMed: 21283604]

Table 1

Demographic characteristics of participants in deliberative discussions

Characteristics of participants (n=48)	n	%
Stakeholder group:		
Primary care provider	15	(29%)
Pediatric hospitalist	10	(21%)
Inpatient nurse	9	(19%)
Emergency room physician	3	(6%)
Parent	3	(6%)
Outpatient nurse	2	(4%)
Specialist pediatrician	2	(4%)
Resident physician	2	(4%)
Other*	3	(6%)
Gender (% female)	31	(65%)
Age (median, IQR)	49 [37-57]	
Race/ethnicity:		
White	36	(75%)
Hispanic or Latino	5	(10%)
Asian/Pacific Islander	4	(8%)
Other	3	(6%)

* including 1 insurance company, 1 case manager, 1 nurse educator

Table 2

Domains and themes emerging in deliberative discussions regarding systems and processes required for high quality direct admissions

Domain & associated themes	Summary of deliberative discussions	Representative quotations
Effective Multi-stakeholder Communication		
Effective communication within inpatient healthcare teams	Importance of effective communication between inpatient physicians, nurses and residents about patients' clinical and non-clinical needs, including anticipated arrival times, reasons for hospitalization, presence of chronic conditions, preadmission therapies, acuity, anticipated hospital management, family and social considerations	*"Any other admission from any other place, PICU, ED, anywhere else, you would get a nurse to nurse report. That would be separate. With direct admissions, the onus is on us to describe adequately and there are always limitations in terms of timing and how busy you are, how busy they are…"* *"We've had a couple of occasions where there is a plan with the daytime doctor, and then the evening doctor has a totally different idea… One saying yes we will take this patient and then the other one saying no, I'm not going to take this patient. I think once the daytime doctor has discussed with the primary care doctor, this is the plan, that we shouldn't be Monday morning quarterbacking them after the fact."*
Effective communication between inpatient and outpatient healthcare providers	Effective communication between referring and accepting healthcare providers facilitated by: (i) trust in referring healthcare provider and respect for their longitudinal relationships with families, (ii) respect for accepting healthcare providers' roles in determining inpatient clinical management, and (iii) ongoing reciprocal communication	*"[Direct admission] works so much better because I know them [referring provider]. I know them, I trust them. I ask them questions. …If things don't go right, we can go back and talk about it…."* *"We have tried every possible means to treat the patient as an outpatient and when we get second guessed, that is the most frustrating situation. When you give vital signs… respiratory rate is this, oxygen saturation is this and I have given this treatment…I have kept him in the office with our rehydration protocol for the last 3 hours and he/she is not doing well. And somebody says, 'Well, did you try clear liquids?' What do you think? I was twiddling my thumbs?"* *"That handoff between physician and physician and nurse to nurse needs to be clear. And I think we fall short of that a lot…"*
Purposeful communication with families	Communication with the family about plans and expectations for treatment and how those plans may differ when arriving on the floor, instructions regarding when and where to arrive at the hospital	*"The dangers of direct admission is confusion for the parents sometimes where the doctor in the office says, 'You are going to come over to the hospital, get an x-ray and an IV' and kids change within hours sometimes. Look better and the fever goes away. So I think we have made gains in saying, 'Please don't tell them they are going to get a lumbar puncture…Just say the doctors there are going to evaluate you and they might do this, but they will come up with a plan.' We've done a lot of communication about trying not to set up a specific plan."*
Resources needed for high quality direct admissions		
Human resources within the hospital	The prompt and ready availability of the medical team including nurses, physicians, respiratory therapists, phlebotomists	*"Have a little bit of a pop off valve in terms of staffing and in terms of somebody being readily available to see that patient immediately when they get there… You know, you are adding a patient to another 4 or 5 patient assignment, sometimes. And the inpatient setting right now, is that our typical day is like 8 to 10 kids go out. 8 to 10 kids come in. So there is a lot of activity and need for a little pop off valve or something to be another pair of hands, another set of eyes. And that is not always available to us."*
Triage system	Importance of consistent system to triage patients at the receiving hospital upon arrival; potential opportunity and challenges of triage in the ED without full ED registration	*"It really depends on the capability of whoever that accepting person is or whatever system is in place, to be able to triage, so you can make a decision based on the clinical appearance of the case rather than diagnoses."* *"If a patient is seen in the ED, they are registered in the ED and they are an ED patient. And it is because we see the patient, there is liability, there is responsibility and accountability for that patient… the patient should be registered, we feel, and the ED should get credit for that visit."*
Availability and limitations of nonhuman resources	The prompt and ready availability of beds, medications, and therapies; limitations of electronic	*"It is the availability of resources on our end. And it is a system problem of us not being able to access things for that child, if they get directly admitted because we have to go through the admission process…so we get held up on our ability to access resources. There*

Domain & associated themes	Summary of deliberative discussions	Representative quotations
	medical records to allow for pre-admission placement of orders	*are some system issues that could definitely be fixed and would make us feel better on the inpatient side of it."*
Resources available to referring providers to initiate patient care	Variation in capabilities and resources of referring healthcare providers to initiate diagnostic testing and therapies	*"We can do a lot of stuff in our office, and for the families it is a nicer place to be than going to the ER where they may not know anybody and they do not know them."*
Systematic approach to preadmission data collection	Value of using a consistent approach to data collection, including a "one call" system to reach the inpatient team, and a data collection instrument to facilitate pre-admission assessment, including vital signs, pertinent medical history; may inform appropriateness of direct admission and facilitate communication within hospital team	*"When somebody calls with a potential direct admission, not just calling the attending, but also talking with the charge nurse, having that be a joint phone call so that way, once you are off the phone with the attending, it doesn't have to be ok, well, let me make sure we have a bed. If you have that in one phone call, then that might simplify that process…"* *"As hospitalists we have a written sign out and it [is] very structured. I wonder if we could create something structured to make sure we have vitals. 'Cause sometime we will ask, and they'll say, 'Oh, he doesn't look good.' But then as an accepting provider, it is harder to know because that is a very subjective thing. So it is nice to have objective criteria… What is the respiratory rate? What is the oxygen saturation?..Many times there is no blood pressure. Or maybe there is no oxygen saturation. And knowing what the meds are so we know what to anticipate."*
Quality reviews	Ongoing approach to evaluate direct admission processes and outcomes	*"I've heard all these anecdotal stories of well, 'We got this patient who comes in on a 6 liter non-re-breather.' And why the hell didn't I hear about it?…We need to talk about that. You know?"* *"Every month, we look at every patient who has come to our floor and needed to leave [transfer to higher level of care]…we are doing quality reviews, so it is very rare that someone slips through the cracks"*
Written direct admission guidelines		
Populations appropriate for and inappropriate for direct admission	Diagnoses, clinical conditions, and vital sign parameters to guide the appropriateness of direct admissions, to identify patients that may not require hospital admission as well as patients that may be too unstable for direct admission	*"I think there are very few diagnoses that are black and white."* *"Personally, I don't think we can make a list with specific diagnoses. It would be more if the patient is stable and isn't going to need immediate medical attention. Does the patient need an IV or resuscitation now? Does the patient need labs immediately?"* *"There are some conditions that should never go to the ED. Like hyperbilirubinemia should never go to the ED."*
Urgency of initial inpatient management	Need for diagnostic testing or interventions within a particular time window	*"They have to be able to be up on the floor for up to 30 minutes before the resident or anyone is going to actually go in and assess them. And so…if they weren't stable enough to be able to do that, then they had to come in through the ER."*
Pre-admission physician assessment	Time window in which an outpatient provider should have seen the patient to consider them as a direct admission, and locations from where direct admissions accepted	*"We do have a specific policy for the hospital when referring from the office that they have to be seen by the physician in the office before they come over. One exception that is written in the policy, is that jaundice - you are home and you hear the lab results. But otherwise all other issues must be seen."*
Times when direct admissions accepted	Hours for accepting direct admissions might be limited	*"I think a lot of times, as a senior resident at night, with no attending in house, you often get admissions that were billed very differently from what they come in as… complex cases that you are just not sure what to do with them. And so I do think, in a system where we don't have attendings at night, you are running a little bit of a risk sometimes."*
Strengths and limitations of written guidelines	Application of guidelines should not override reciprocal communication between referring and accepting providers	*"…One of the big hang-ups with guidelines and policies around this is nothing should ever trump the fact that I can say, 'Well, [hospitalist], here is what I'm actually dealing with. And I've got this and this. You are like, Oh, well, you know. If you have this and this.' There has to be a very clear pathway to say, 'Let's communicate about this and see what the situation is, you know?"*

Domain & associated themes	Summary of deliberative discussions	Representative quotations
Family preferences and needs		
Preference to avoid the ED	Primary care providers and parents described how and why they preferred to avoid ED utilization	*"Being able to avoid the ER and going straight from the pediatrician to the hospital was fantastic…"* *"Mostly we have always gone through the ER and she just hates the ER. She just don't like that. Cause I think everything is very hectic in there".*
Family-centered care	Importance of understanding families' preferences regarding sites of care, emphasizing the importance families' experiences of care	*"If your patients have preferences, knowing what they want is helpful."* *"But we get into the clinical technology of what we need to do and we forget that this is a person - a mom and a dad and a child - who are now being displaced. "*

Table 3

Outcomes to evaluate direct admission systems of care as prioritized by participants in deliberative discussions.

Outcomes suggested by participants	Votes cast (n=135)* n	%	Representative quotations
Clinical outcomes			
Unplanned transfer to higher level of care	26	19%	*"Did the patient present as billed? …Were they discharged from the floor in a few hours because they were less acute than anticipated? Or were they transferred to the PICU?"* (Inpatient nurse) *"That final outcome is really the patient recovery… How soon, how quick, how complete, is the recovery. And any readmission down the road. Any complications. Like escalated to ICU? All those are of interest in addition to patient and family experience…"* (Primary care provider) *"It's just that we, in our head, are thinking 'Ok, what's the worst this patient could look like?' Because we don't want the patient to come to the floor and then have a Rapid Response…" (*Hospitalist) *"None of us are ever going to be right all the time. And I don't know to what degree we want to manage to the safest level possible. You said you are only thinking worst case scenario. I get that. But if we always truly cover for that, we are going to see our costs go way up and our satisfaction go way down. We are going to see every measureable point except for that unlikely worst case scenario outcome, every other parameter is going to go in the other direction."* (Primary care provider)
Length of stay in the hospital	8	6%	
Number/% of patients redirected to the ED	4	3%	
Mortality	3	2%	
Hospital readmission	2	1%	
Medication errors	2	1%	
Disease-specific quality measures	2	1%	
Number/% of hospitalizations for non-medical indications	2	1%	
Medication reconciliation errors	1	1%	
Rapid response calls	1	1%	
Number of high-turnover hospitalizations (< 8 hour, <24 hour duration)	0	0%	
Number/proportion of patients with significant work of breathing/ respiratory distress	0	0%	
Number/proportion of patients requiring urgent/emergent procedures	0	0%	
Efficiency and healthcare costs			*"Our goal…is to avoid ED utilization. We are in our offices. We have extended hours. We have urgent cares. We have weekend availability. You know, the whole idea is, with all of this availability, every goal is to minimize our most expensive, least efficient form of health care, which is the emergency department."* (Primary care provider) *"So our thinking in the ER is, 'Are we going to add any value to really bringing this patient in through the ER?' If the answer is yes, great. If the answer is no, they should be a direct admit."* (Emergency room physician) *"When people come into the hospital who I don't think should have and then go home the next morning. So to me, I think that is a quality issue when you get admitted, when you don't need to be admitted."* (Hospitalist)
Total cost of episode of care	9	7%	
Insurance denials for observation or inpatient level of care	2	1%	
Out-of-pocket costs experienced by families	0	0%	
Timeliness outcomes			*"I think my biggest concern would be a child arriving on the floor and having no one see them for a period of time and having them get very sick before someone - either a nurse or a physician - to go in and see them. I mean I see that as the biggest potential risk. Making sure that if we do accept the direct admission,*

Outcomes suggested by participants	Votes cast (n=135)* n	%	Representative quotations
Time from arrival on hospital floor until initial administration of intervention and/or medications	15	11%	*there is some person - some staff - free to go and assess that patient right away."* (Inpatient nurse) *"What is the benchmark on the time [from referral] to admission? Time to decision [to accept the patient], time to arrival, and the length of time also benchmarking ourselves."* (Inpatient nurse)
Delay in care (unspecified)	12	9%	
Time from referring provider call initiation to accepting provider call response	11	8%	
Time from acceptance of patient until patient arrival on the floor (timely patient arrival)	3	2%	
Time from arrival on hospital floor until initial clinical assessment	2	1%	
Time from admission request to bed placement	1	1%	
Time from arrival on floor until initial orders placed	0	0%	
Multi-stakeholder reported experience of care			*"I think you also have to decide the guiding mission of it. Is it the patient's experience? Or is it cost? And I think those two are really going to hit heads."* (Primary care provider) *Looking at the family experience perspective, a deductible has a huge impact on a family at times."* (Primary care provider) *"The referring physician satisfaction. But also the person who is accepting the patient, taking care of the patient and assessing the patient for admission. Did they have the information they needed?"* (Primary care provider)
Families' self-reported experiences of care	22	16%	
Accepting healthcare team satisfaction with processes	3	2%	
Referring provider satisfaction with process	2	1%	
Quality of handoff from referring to accepting provider	2	1%	

* each participant cast up to 3 votes to select the outcomes they considered best suited to evaluate direct admission systems

Table 4

Summary of direct admission guideline components and outcomes prioritized by Delphi panelists to evaluate the quality of hospital admission processes

Pre-admission Communication

- Hospitals have established, consistent systems to receive direct admission referrals, to document key information, and to share information with the inpatient healthcare team; all accepting providers should be aware of the hospital's direct admission guidelines.
- As part of the direct admission referral process, a direct and mutually respectful conversation occurs between the referring and accepting provider, with person(s) joining the call who are aware of current bed and staff availability as well as wait times for beds (if applicable).
- The accepting hospital has a secure fax number or electronic medical record system that allows the referring provider to share relevant information at the time of the patient referral (for example, lab results)
- To reduce unnecessary hospitalizations, patients who do not meet hospital admission/observation criteria at the time of the patient referral (based on accepting physician judgment) are directed to the ED for initial assessment/management

Written guideline components

- Hospitals accepting direct admissions should develop and share written direct admission guidelines with referring practices and hospitals
- Direct admission guidelines include a list of diagnoses/conditions recommended for direct admission (i.e. neonatal jaundice, failure to thrive, skin and soft tissue infections), not recommended for direct admission (i.e. trauma, respiratory distress, hemoptysis, gastrointestinal bleeding), and acceptable for direct admission from home (i.e. neonatal jaundice, cystic fibrosis exacerbation not responding to outpatient antibiotics)
- Children referred for direct admission should not require emergent tests or treatments, and should be clinically stable such that they can safely wait on the hospital ward prior to assessment/management by a member of the hospital team
- Direct admissions are limited to the period of time that a physician or associate provider is available to see the patient when they arrive at the hospital
- Ambulance services bringing patients for direct admissions are provided with a contact number for a healthcare provider at the accepting hospital, and asked to call if the clinical status of the patient changes en route to the hospital.

Hospital resources for patient care

- A member of the healthcare team is available to assess the patient's vital signs and clinical status within 15 minutes of the patient's arrival on the pediatric ward
- Medications and supplies commonly required for directly admitted patients are available on the admitting unit of the hospital
- Hospitals have appropriate wheelchairs available at the planned site of entry into the hospital

Special populations

- A child's risk from infectious disease exposures in the emergency department should be taken into account when deciding whether the patient should be admitted directly.
- Special efforts should be made to safely directly admit neonates, children who are immunocompromised and/or well-known to the inpatient care team (including readmitted patients) and/or with significant behavioral disorders if they are clinically stable.

Communication with Families

- If the patient is off-site from the hospital and not coming by ambulance, referring providers instruct families to come directly to the hospital (unless otherwise discussed between referring and accepting providers)
- Referring providers explain to families that their child will be evaluated by the hospital-based healthcare team, and that their child's treatment plan will be informed by this evaluation
- Families are given clear instructions about how to get to the pediatric unit where their child will be admitted, who to meet/ask for, the name of the accepting physician, a contact number at the hospital if they get lost or experience other delays, and what they need to bring to the hospital (for example, any home medications or equipment/supplies).

Evaluation of direct admission processes and outcomes

- Hospitals should have a quality review process to review outcomes for directly admitted patients, to improve systems on an ongoing basis

- Feedback to and from referring healthcare provider should be incorporated into the quality review process.

Outcomes to evaluate the quality of direct admission include *

- Unanticipated transfer to the pediatric intensive care unit or to another hospital for a higher level of care within 6 hours of hospital admission
- Rapid response calls within 6 hours of hospital admission
- Total time from the time of arrival on the pediatric ward to initial assessment by the admitting physician or associate provider
- Time from initial call from the referring provider until the patient is accepted for direct admission or routed elsewhere
- Total time from the time of arrival on the pediatric ward to initiation of treatment
- Patient and family experience of care
- Number/% of directly admitted patients thought to be unnecessary or inappropriate from the perspective of the accepting physician
- Rates of medication errors
- Referring provider satisfaction/experience
- Inpatient team satisfaction/experience
- Number/% of directly admitted patients who are discharged home within 8 hours of arrival
- Number/% of patients admitted to the unit or service that are admitted directly
- Total costs of the hospitalization

* listed in order from most to least highly recommended by Delphi panelists

Table 5

Direct admission guideline components not endorsed as appropriate and necessary by multistakeholder panel *

Appropriate but not necessary guideline components
Referring providers should have the following information available at the time they refer a patient for direct admission:
The type of bed required for the admitted child (for example, crib, net bed)
If hospitals do not have dedicated observation units, hospitals should develop a plan of care for patients anticipated to require short stays (ie < 8 hrs) for when that care can't be provided by the referring provider
Personnel from the admission office come to the patient's room to complete admission processes at the bedside, so that families do not need to stop at the admission office en route to their hospital room
Hospitals have a pre-admission system that allows orders to be placed for the patient in advance of their arrival
Hospitals have a system to pre-order specific medications and supplies for a patient in advance of their arrival.
To facilitate imaging for children who are directly admitted, hospitals should develop systems that allow children being directly admitted to have the same priority for imaging as children admitted through emergency departments (for example, requests for stat X-ray or CT can be accommodated for directly admitted patients)
Children with cystic fibrosis may be particularly well-suited for direct admission to hospital.
Families are given instructions about which hospital entrance to use, and where to find wheelchairs, if needed.
Families are given clear instructions about where to park at the hospital
Guideline components categorized as neither appropriate nor necessary
Referring providers should have the following information available at the time they refer a patient for direct admission:
i. Referring physician's estimate re. how long the patient could safely wait before care is initiated in the hospital
ii. Name and contact number of the parent/guardian who will be accompanying the child for admission
Patients should have vital signs within normal ranges for age in order to be directly admitted
Direct admissions are not accepted from non-pediatric referring providers (for example, non-pediatric ED physicians, nurse practitioners, or physicians assistants) unless an attending physician (ie not a resident) is available to see the patient within 4 hours of their admission to hospital
A patient should have been seen by the referring provider within 4 hours of the requested direct admission
In order to be directly admitted, patients must come directly from a physician's office, ED or urgent care clinic
Healthcare providers accepting the phone calls for direct admissions apply the Pediatric Early Warning System (PEWS) to information received from the referring healthcare provider to calculate a PEWS
Children being admitted directly first have their vital signs assessed in the hospital's emergency department and reviewed by the admitting physician prior to proceeding their admission location
Hospitals should work to discharge patients early in the day to free up nursing resources for direct admissions later in the day
Febrile infants < 60 days admitted to rule-out sepsis may be particularly well-suited for direct admission to hospital
Families are given a map and/or clear written instructions describing how to get from the parking lot to the unit where their child will be admitted
Outcomes to evaluate the quality of direct admissions include: length of stay in the hospital

* although panelists rated each item separately for community hospitals and children's hospitals, categorization of responses did not differ by hospital type