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Phlebotomy-Free Days in Common Conditions Among Hospitalized Children and the Association with Clinical Outcomes

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BACKGROUND

- Phlebotomy is an invasive procedure associated with pain and iatrogenic anemia.
- Minimizing phlebotomy for hospitalized children could improve their experience and avoid unnecessary tests.

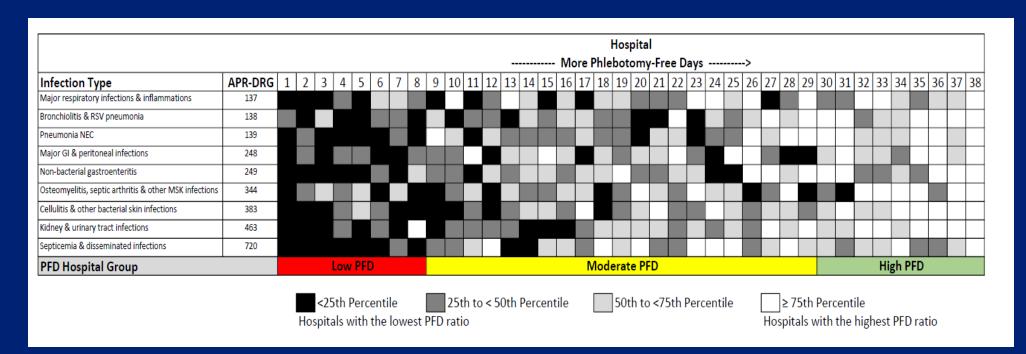
OBJECTIVES

- To describe:
- 1) The prevalence of phlebotomy-free days among children hospitalized with common conditions
- 2) The association of phlebotomy-free days with clinical outcomes

METHODS

- Multicenter, cross-sectional study
- Children hospitalized with 9 common infections identified using APR-DRGs
- Exclusion Criteria: Length of stay (LOS) < 2 days, medical complexity, interhospital transfers, intensive care (NICU/PICU)
- We examined phlebotomy free days (PFD) by infection type and hospital. PFDs defined as the proportion of hospital days with no laboratory blood testing.
- Hospitals were grouped into low, moderate and high PFD groups based on mean PFD ratio across the infection types.
- Adjusted outcomes were compared across groups and included LOS, costs, and all-cause 14- and 30-day readmission rates.

Hospitals with low, moderate and high ratios of phlebotomy-free days (PFDs) had no differences in outcomes.



Heat map demonstrating variation in proportion of PFDs by hospital (adjusted for H-RISK).

	Hospital PFD Group			
	Low PFD Hospitals	Moderate PFD Hospitals	High PFD Hospitals	þ
Length of stay (days), Mean (95% CI)	1.7 (1.7, 1.7)	1.7 (1.6, 1.8)	1.7 (1.6, 1.8)	0.753
Cost (S), Geometric Mean (95%CI)	4819 (4778.2, 4860.1)	4819 (4161.8, 5579.9)	4999.3 (4231.5, 5906.4)	0.244
14-d readmission rate, % (95% CI)	3.5 (3.3, 3.7)	3.5 (3.1, 3.9)	3.2 (2.9, 3.6)	0.122
30-d readmission rate , % (95% CI)	5.4 (5.1, 5.7)	5.4 (4.8, 6.1)	4.9 (4.4, 5.5)	0.184

^{*} Patient-level factors include: HRISK, age, race/ethnicity, payor

Association of hospital testing clusters and outcomes adjusted for hospital and patient-level factors*.

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RESULTS

- 126,135 patient encounters
- Diagnoses with highest overall PFD ratios:
 - Bronchiolitis: 0.78Pneumonia: 0.54
- Diagnoses with lowest overall PFD ratios:
 - Bone and joint infections: 0.28
 - Non-bacterial gastroenteritis: 0.30
- Wide variation in PFD ratios across common infections and hospitals
- Small but statistically significant differences in the distributions of age, payer, and H-RISK among patients in the low, moderate, and high PFD hospital groups (Table Below)
- No differences in adjusted outcomes across low, moderate, and high PFD hospital groups (Table Central)

		Hospital PFD Grou	р	
	Low PFD	Moderate PFD	High PFD	
	Hospitals	Hospitals	Hospitals	
# Hospitals	8	21	9	
# Hospitalizations	23,728	71,894	30,513	
Age				
< 1 yr	9775 (41.2)	27600 (38.4)	12423 (40.7)	
1 - 5 yrs	8815 (37.2)	28300 (39.4)	11743 (38.5)	
6 - 12 yrs	3220 (13.6)	10127 (14.1)	3954 (13)	
13 - 18 yrs	1918 (8.1)	5867 (8.2)	2393 (7.8)	
Gender				
Male	12481 (52.6)	38004 (52.9)	16252 (53.3)	
Female	11245 (47.4)	33829 (47.1)	14258 (46.7)	
Race/Ethnicity				
Non-Hispanic White	12903 (54.4)	33434 (46.5)	12058 (39.5)	
Non-Hispanic Black	3900 (16.4)	12296 (17.1)	6458 (21.2)	
Hispanic	3772 (15.9)	19323 (26.9)	7713 (25.3)	
Asian	1139 (4.8)	1938 (2.7)	952 (3.1)	
Other	2014 (8.5)	4903 (6.8)	3332 (10.9)	
Payer				
Government	13059 (55)	42359 (58.9)	18032 (59.1)	
Private	9096 (38.3)	25661 (35.7)	11232 (36.8)	
Other	1573 (6.6)	3874 (5.4)	1249 (4.1)	
H-RISK	0.75 (0.47)	0.73 (0.50)	0.73 (0.46)	

All comparisons statistically significant (p< 0.001) except gender (p = 0.298). H-RISK presented as mean (SD); other variables N(%).

CONCLUSIONS

- Among children hospitalized with common infections, there was variation across infection types and hospitals in proportions of PFDs.
- Hospitals with low, moderate and high PFD ratios had no differences in outcomes.
- Our data suggest opportunities to improve the experience and care of children hospitalized for many common infections without negatively affecting clinical outcomes through reductions in daily laboratory blood collection.