

Factors that Impact the Efficiency of a Lean-Designed Pediatric ED

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Background

- Overcrowding threatens quality of care in the Emergency Department
 - Increased error rates
 - Lengthens LOS
 - Poor customer satisfaction
- Lean design has been shown to improve quality of care

Innovation Description

- Lean design for physical space and processes of a free-standing Pediatric Emergency Department
 - Maximize patient value
 - Limit waste
 - Reduce variation
- **Team Triage**
 - Coordinated team-based approach
 - H&P + Triage performed simultaneously
 - MD + RN + Family
 - Plan Discussed
 - Orders immediately executed
- Created LOS Categories
 - ESI not predictive of ED LOS
- Goal of Project was to identify what factors cause our processes to fail

Innovation Description

LOS Category	Description	TakT Time (mins)
1	Treat and Street. Fast Track	41
2	Low Acuity. Simple lacerations or fractures, patient requiring labs	143
3	Mid LOS without admission. Sedation, Asthma, Moderate Dehydration	306
4	Complex requiring admission. DKA, Multisystem Trauma, Fever in Immunocompromised	191
5	Mental Health	269

Results of Innovation

- 541/6516 (8.3%) did not meet cycle time metrics and were included for analysis
- Throughput Metrics during study period.

	Study Cohort	ED Population
Daily Volume	33.3	29.9
ED DC LOS (mins)	213	96.2
Door to Doctor (mins)	26	15.9
Discharge (%)	96.3	99.3
Transferred (%) (n=275)	3.7	0.7
ESI-1 (%)	0.5	0.6
ESI-2 (%)	6.6	7.8
ESI-3 (%)	44.3	34.3
ESI-4 (%)	37.5	49.4
ESI-5 (%)	10.9	7.8

Results of Innovation

	Category 1	Category 2	Category 3	Category 4
Expected LOS (mins)	41	134	306	191
Missed LOS (mins)	75	211	425	283
Door to Doctor (mins)	30	27	15	23
Day Shift (n)	36	101	21	2
Evening Shift (n)	59	215	40	2
Overnight Shift (n)	13	46	11	0
Ultrasound (n)	1	7	1	0
CXR (n)	0	140	15	0
Urinalysis (n)	1	40	14	1
>2 Tests (n)	0	60	27	0
ESI-1	0	0	1	2
ESI-2	2	8	25	1
ESI-3	3	194	44	1
ESI-4	44	160	2	0
ESI-5	59	0	0	0

Lessons Learned

- A novel, team-based approach to triage, resulted in front-end efficiency and a low LWBS rate (0.002%)
- Volume surges did not impact efficiency metrics
- Expected LOS was unexpectedly prolonged when resources were consumed, especially lower acuity patients.
 - X-ray
 - Urinalysis
 - ED Transfer