

Keeping the Seats Cold Through Outpatient Flow Management



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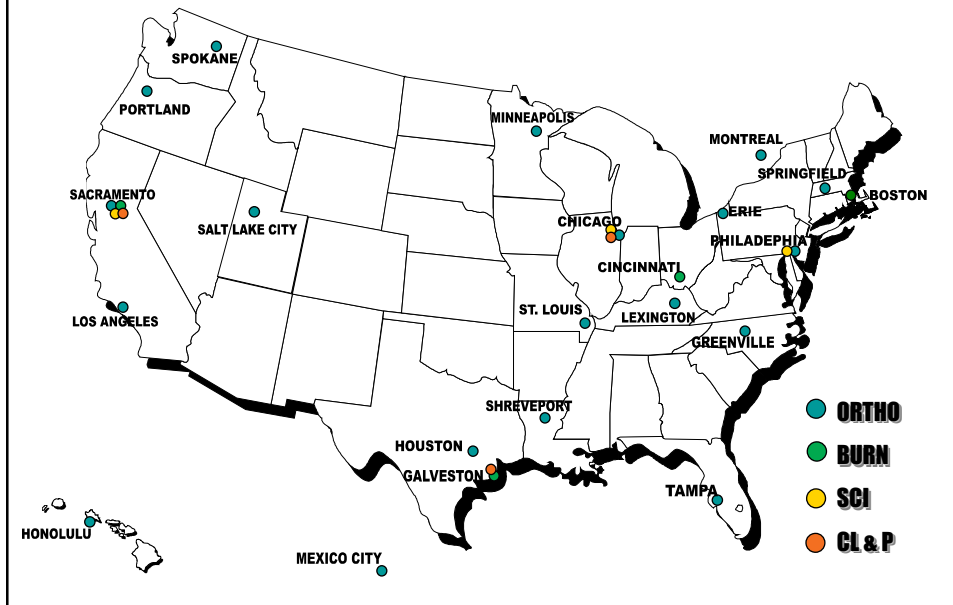
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for Children™

Shriners Hospitals for Children



- Opened first hospital in Shreveport, LA in 1922
- 22 hospitals in the United States, Canada, and Mexico
- Over 835,000 children cared for
- \$782M 2008 Operating Budget
- \$44M 2008 Research Budget
- **Care provided at NO COST to families**

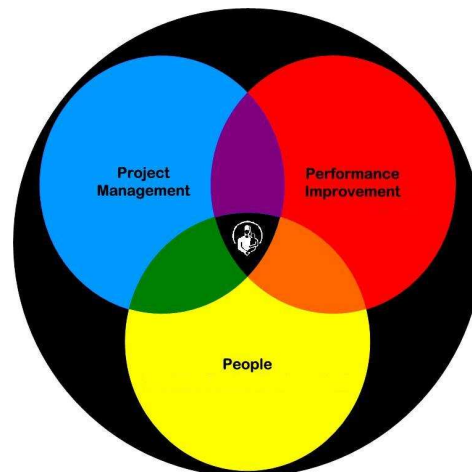
Shriners Hospitals for Children – Service Lines



Shriners Performance Excellence Program

SP3

The Power of Three in Performance Excellence



Investigation Team

Initiative Lead:
Roger Noble, Headquarters

Hospital Lead:
Jean Tauber, Erie

Contributing Hospital Teams:
Margaret Adams, Honolulu
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Hospital Pilot:
Pam Stodghill, Greenville



Purpose of the Study



Outpatient activity represents the highest volume of patient activity and establishes first impressions of SHC.

Determine the most significant contributing factors resulting in Outpatient Wait Times, Patient Throughput challenges, and Outpatient Capacity Planning challenges.

SP³ and **Six Sigma** Buy-in by demonstrating the value of the tools.

Structure of the Study



- **STAGE ONE (2008)**. High level time study tracking the patient from the moment they enter the outpatient clinic until they leave the hospital.

- “**patient idle time**” versus “wait time”

- identify the key contributing administrative and clinical factors/areas causing bottlenecks in the outpatient process

- **STAGE TWO (2009-2010)**. In depth improvement projects focusing on the key contributing factors to outpatient wait times from STAGE ONE.



Steps to the Project

- **Pilot**

- **Data Definition** – Customization of tools, Can take out but can't put in

- **Data Collection** – Encourage participation - timer, iPod, variation in data collection methodology

- **Data Analysis** – Headquarters and Hospital Specific



Analysis Approach

GATING: setting the priority of analysis

1. **Volume:** based on clinic type
2. **Waste:** determined by **Patient Idle Time**
3. **Control:** based on the following **TWO** factors
 1. Degree of variation in total patient visit time
 2. Degree of variation in total patient idle time
4. **Complexity:** based on the following **THREE** factors
 1. Percentage of New Patients within a clinic
 2. Percentage of No-Shows and Walk-ins within a clinic
 3. Average number of ancillary services performed per patient within a clinic



3-Dimensional Analysis

understanding the single variant view



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Impact Ranking by Time of Day

Hour Block of Appt	Category Analysis											Cumulative Relative Weight of Impact Ranking Score	Significant Wait Time Factor Ranking
	<5%		<25%		<50%		>10 doubles score			Control	Complex		
	Volume	Waste	Control	Control	Complex	Complex	Complex	Volume	Waste				
% of total Clinic Visits	% of total Patient Idle Time of total Visit Length per Clinic	% Visit Length Standard Deviation of Average Visit Length	% Patient Idle Time Standard Deviation of Average Patient Idle Time	% of New Patients of Total Visits	% of No-Shows and Walk-ins of Total Visits	Average Ancillary Service Count per Clinic Visit	Relative Weight of Impact Ranking Score	Relative Weight of Impact Ranking Score	Relative Weight of Impact Ranking Score	Relative Weight of Impact Ranking Score			
7:00	2.77%	39.66%	61.34%	101.03%	13.98%	7.63%	3.1	9	6	7	4	26	6
8:00	16.33%	30.31%	53.36%	118.63%	15.88%	2.92%	3.1	3	11	7	5	25	5
9:00	14.00%	35.89%	57.29%	111.73%	6.95%	3.48%	3.3	1	9	6	6	22	3
10:00	14.66%	39.42%	51.86%	101.51%	2.44%	2.85%	3.2	4	7	10	8	28	8
11:00	7.21%	40.99%	62.47%	121.56%	1.65%	5.37%	2.5	7	4	4	8	23	4
12:00	8.38%	36.60%	52.66%	89.49%	22.72%	7.47%	3.2	6	8	11	3	27	7
13:00	17.62%	41.43%	54.16%	100.80%	11.34%	4.06%	3.1	2	2	9	6	19	1
14:00	9.18%	41.03%	53.15%	109.66%	1.95%	5.19%	2.8	5	3	5	8	21	2
15:00	4.20%	31.25%	45.62%	129.58%	0.00%	2.13%	2.2	8	10	7	12	37	9
16:00	1.49%	14.00%	45.55%	168.28%	0.00%	4.00%	1.3	10	22	7	11	50	10
17:00	0.12%	3.75%	0.00%	200.00%	0.00%	0.00%	1.0	22	24	7	14	67	12
18:00	0.03%	97.16%	0.00%	0.00%	0.00%	0.00%	2.0	24	1	14	13	52	11

1pm and 2pm are 75% more significant than the average time of day significance (33).

Impact Ranking by Clinic Type

ClinicType	Category Analysis											Cumulative Relative Weight of Impact Ranking Score	Significant Wait Time Factor Ranking
	<5%		<25%		<50%		>10 doubles score			Control	Complex		
	Volume	Waste	Control	Control	Complex	Complex	Complex	Volume	Waste				
% of total Clinic Visits	% of total Patient Idle Time of total Visit Length per Clinic	% Visit Length Standard Deviation of Average Visit Length	% Patient Idle Time Standard Deviation of Average Patient Idle Time	% of New Patients of Total Visits	% of No-Shows and Walk-ins of Total Visits	Average Ancillary Service Count per Clinic Visit	Relative Weight of Impact Ranking Score	Relative Weight of Impact Ranking Score	Relative Weight of Impact Ranking Score	Relative Weight of Impact Ranking Score			
Upper/Lower Extremity	2.46%	52%	94%	89%	12%	9%	3.9	4	22	28	16	70	1
Otitides	1.06%	59%	78%	112%	0%	5.6%	1.9	26	8	11	25	72	2
Hand	1.66%	48%	67%	88%	5%	14%	2.7	7	26	20	22	75	3
Orthopaedic (Incl. Arthrogyrosis/Brachioplexis)	57.97%	39%	58%	104%	10%	6%	3.2	1	36	20	20	77	4
Rheumatology	1.03%	59%	72%	96%	5%	3%	3.1	28	10	18	25	81	5
Scoliose	3.53%	41%	47%	78%	2%	7%	3.7	3	32	33	17	85	6
Preadmission	0.52%	79%	57%	67%	11%	0%	5.2	40	3	28	16	87	7
Plastics	0.49%	53%	76%	116%	12%	0%	2.8	42	11	11	25	89	8
New Patient/Screening	1.63%	25%	55%	130%	100%	16%	3.6	8	62	14	10	93	9
Neurology/Neurosurgery	1.38%	37%	53%	90%	0%	10%	3.3	10	38	25	22	94	10

Upper/Lower (#1) is 50% more significant as the average clinic (126 cumulative score)

Impact Ranking by Day of Week

Appointment Day	Category Analysis							>10 doubles score				Cumulative Weight of Impact Ranking Score	Significant Wait Time Factor Ranking
	<5%		<25%		<50%		Volume	Waste	Control	Complex			
	Volume	Waste	Control	Control	Complex	Complex	Complex	Volume	Waste	Control	Complex		
	% of total Clinic Visits	% of total Patient Idle Time of total Visit Length per Clinic	% Visit Length Standard Deviation of Average Visit Length	% Patient Idle Time Standard Deviation of Average Patient Idle Time	% of New Patients of Total Visits	% of No-Shows and Walk-ins of Total Visits	Average Ancillary Service Count per Clinic Visit	Relative Weight of Impact Ranking Score	Relative Weight of Impact Ranking Score	Relative Weight of Impact Ranking Score	Relative Weight of Impact Ranking Score		
Monday	16.08%	34%	82.86%	115.73%	15.51%	9.09%	2.8	4	4	2	3	14	2
Tuesday	24.13%	40%	61.72%	111.57%	7.35%	6.40%	3.2	1	1	3	4	9	1
Wednesday	22.99%	40%	53.55%	104.41%	5.99%	6.36%	3.0	2	2	6	6	16	5
Thursday	22.47%	34%	60.82%	117.10%	8.80%	6.63%	3.1	3	6	2	3	14	3
Friday	14.27%	37%	59.16%	107.35%	8.03%	10.24%	3.1	5	3	5	3	16	4

Tuesday is 50% more significant as any other day of the week.

Impact Ranking by Ancillary Service

Ancillary Service	Category Analysis				>10 doubles score			Cumulative Weight of Impact Ranking Score	Significant Wait Time Factor Ranking
	<5%		<25%		Volume	Waste	Control		
	Volume	Waste	Control	Control	Volume	Waste	Control		
	Standard Deviation of Service Length	# of Services Performed	Average Service Length	% Standard Deviation of Average Service Length	Relative Weight of Impact Ranking Score	Relative Weight of Impact Ranking Score	Relative Weight of Impact Ranking Score		
Orthotics & Prosthetics	30.3	674	34.8	95.4%	4	6	11	21	1
Physical Therapy	22.2	510	43.0	51.5%	5	2	22	29	2
Occupational Therapy	21.0	209	34.5	60.9%	8	7	19	34	3
Seating	41.9	98	32.7	128.4%	22	8	6	36	4
Pre Exam Triage	12.3	1413	9.3	132.5%	2	38	4	44	5
Care Coordination	14.4	346	14.1	102.2%	7	26	12	45	6
RN	14.7	183	11.2	131.1%	9	36	5	50	8
XRay	8.8	1164	13.0	68.0%	3	28	18	49	7
Motion Analysis Lab	48.2	48	63.9	75.5%	34	1	15	50	10
All Other Medical Consult	9.6	360	12.7	75.5%	6	32	16	54	12

Orthotics & Prosthetics (#1) is 28% more significant than the next most significant contributing ancillary service: Physical Therapy (#2).

4-Dimensional Analysis

understanding variant relationships



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Impact Ranking by Ancillary Service Related to Clinic Type

Ancillary Service	ClinicType	Standard Deviation of Ancillary Service	Category Analysis			>10 doubles score			Cumulative Weight of Impact Ranking Score	Significant Wait Time Ranking
			Control		Control		Control			
			Volume	Waste	Volume	Waste				
Orthotics & Prosthetics Seating	Other	28.58	170	46.98	61%	6	8	37	51	1
Orthotics & Prosthetics Physical Therapy	Orthopaedic (Incl. Arthrogyposis/Brachioplexis)	44.58	79	40.00	111%	22	22	10	54	2
Motion Analysis Lab	Orthopaedic (Incl. Arthrogyposis/Brachioplexis)	38.54	366	28.70	110%	3	44	11	58	3
Occupational Therapy	Orthopaedic (Incl. Arthrogyposis/Brachioplexis)	22.25	181	35.14	63%	5	28	32	65	4
Orthotics & Prosthetics Care Coordination	Orthopaedic (Incl. Arthrogyposis/Brachioplexis)	42.40	32	72.56	58%	34	2	39	75	5
NP	Orthopaedic (Incl. Arthrogyposis/Brachioplexis)	17.82	92	28.91	62%	9	42	34	85	6
Orthotics & Prosthetics	Scoliosis	35.28	15	39.80	89%	48	24	14	86	7
Orthotics & Prosthetics	Orthopaedic (Incl. Arthrogyposis/Brachioplexis)	14.89	232	15.08	99%	4	76	12	92	8
Orthotics & Prosthetics	Orthopaedic (Incl. Arthrogyposis/Brachioplexis)	13.92	71	25.61	54%	24	50	45	119	9
Orthotics & Prosthetics	Limb Deficiency	21.96	11	40.45	54%	64	11	46	121	10

Orthotics & Prosthetics (#1) is 83% more significant than the average ancillary service significance and shows up in 4 of the top 10 clinic/ancillary service pairings.

Impact Ranking by Tuesday Clinics and Clinic Type

ClinicType	Tuesday Clinics		Sum of Ancillary Service Count	% of Total Volume Ancillary Service	FMEA equivalent	Significant Factor Ranking
	Count of MRN	% of Total Volume MRN				
Orthopaedic (Incl. Arthrogyposis/Brachiolexis)	459	54.4%	1536	57.1%	31.1%	1
Upper/Lower Extremity	86	10.2%	281	10.5%	1.1%	2
Other	75	8.9%	126	4.7%	0.4%	3
Cerebral Palsy	19	2.3%	114	4.2%	0.1%	4
Myelodysplasia	17	2.0%	69	2.6%	0.1%	8
Clubfoot	31	3.7%	68	2.5%	0.1%	5
Admissions	20	2.4%	67	2.5%	0.1%	6
Cleft Lip/Palate	21	2.5%	63	2.3%	0.1%	7
Casting	18	2.1%	59	2.2%	0.0%	9
Rheumatology	16	1.9%	44	1.6%	0.0%	10

On Tuesdays, Ortho including Arthro (#1) clinics are 300% more significant than Upper/Lower Extremity (#2).

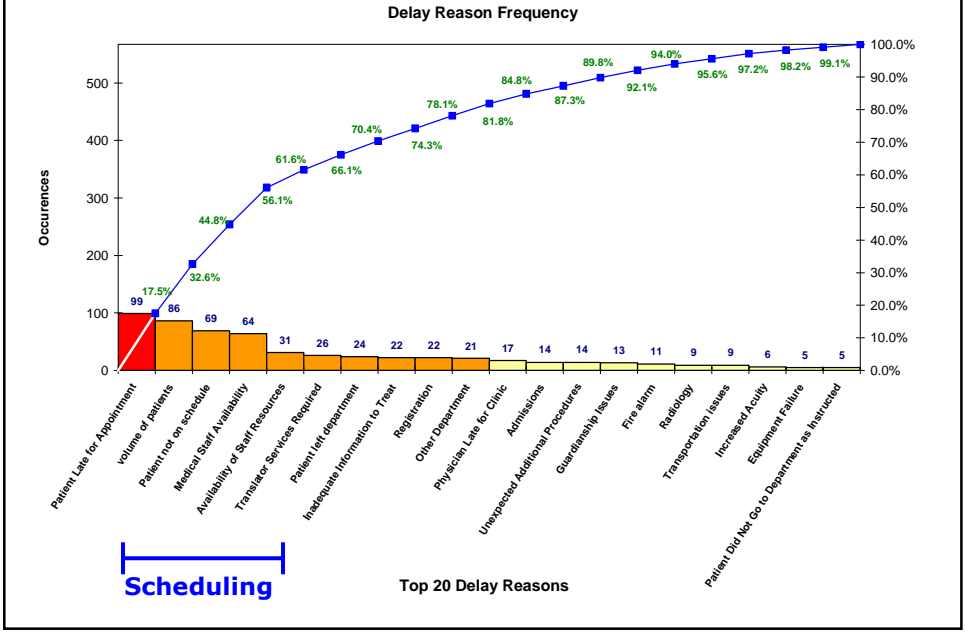
Reasons for Delays

Grouping the Obvious Detectable Causes

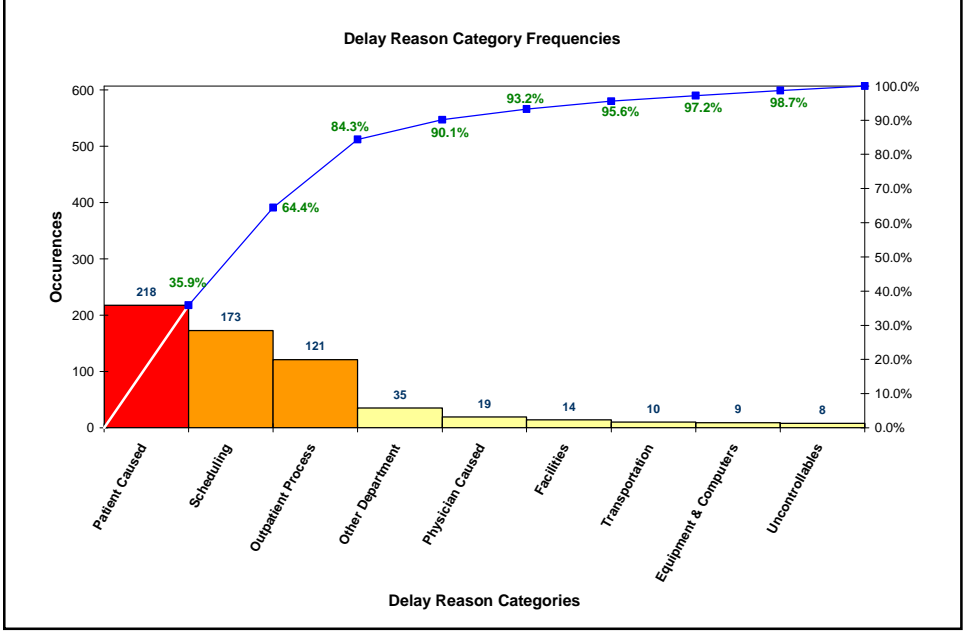


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Pareto Chart for Delay Reasons



Pareto Chart for Delay Categories



Stage One Significant Factors

Day of Week	: Tuesdays	: focus here may impact 25% of all patient visits
Clinic Type	: Upper/Lower Extremity, Orthotics, Hand, Rheumatology, Orthopaedic, Scoliosis	: focus here may impact 65% of all patient visits
Service/Ancillary Type	: O&P, Physical Therapy, Seating	: focus here may impact 60% of all patient visits
Reason for Delay	: Patient Caused & Scheduling	: focus here may impact 65% of all patient visits
Compounded Potential Patient Visits Impacted		: 94%



Lessons Learned



- Defined Time Frame – Very Focused
- Data Definition is major hurdle
- Variation of Hospital Operations
- Holding People Accountable is important - **Human Sigma**
- Sequencing
- Data base compatibility (Access)



Stage One MUDA and LEAN Results



- Stage One was not intended to provide fixes but focus the future improvement efforts on what would have the biggest impact.
- **Low Hanging Fruit** became obvious during the time study and many were immediately addressed.
- Various **LEAN** and **6S** efforts launched
 - SHC incorporates Safety in everything we do, adding an extra "S" to the standard 5S

Example Results from Stage One



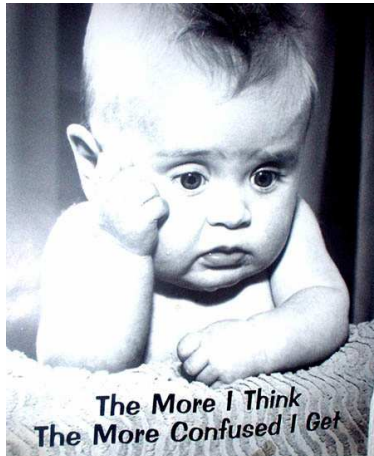
- Redevelopment/consolidation of patient forms
 - **Registration process time reduced 60%**
- Clinic/patient room utilization changed for those patients waiting for ancillary services
 - **Room availability and subsequent throughput increased 15%**
- Diagnostic/X-ray utilization during Triage evaluated resulting in new clinic protocols to ensure appropriateness of requests
 - **unnecessary X-ray activity reduced 20%**

Stage Two Focus



- Orthotics and Prosthetics lab process
- Physical Therapy clinic process
- Patient caused delays for outpatient activity

Questions



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