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Cube Scheduling – Pharmacy Optimization

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Disclosures

- The presenter has no real or perceived conflicts of interest related to this presentation

Note: This program may contain the mention of suppliers, brands, products, services or drugs presented in a case study or comparative format using evidence-based research. Such examples are intended for educational and informational purposes and should not be perceived as an endorsement of any particular supplier, brand, product, service or drug.

Learning Objectives

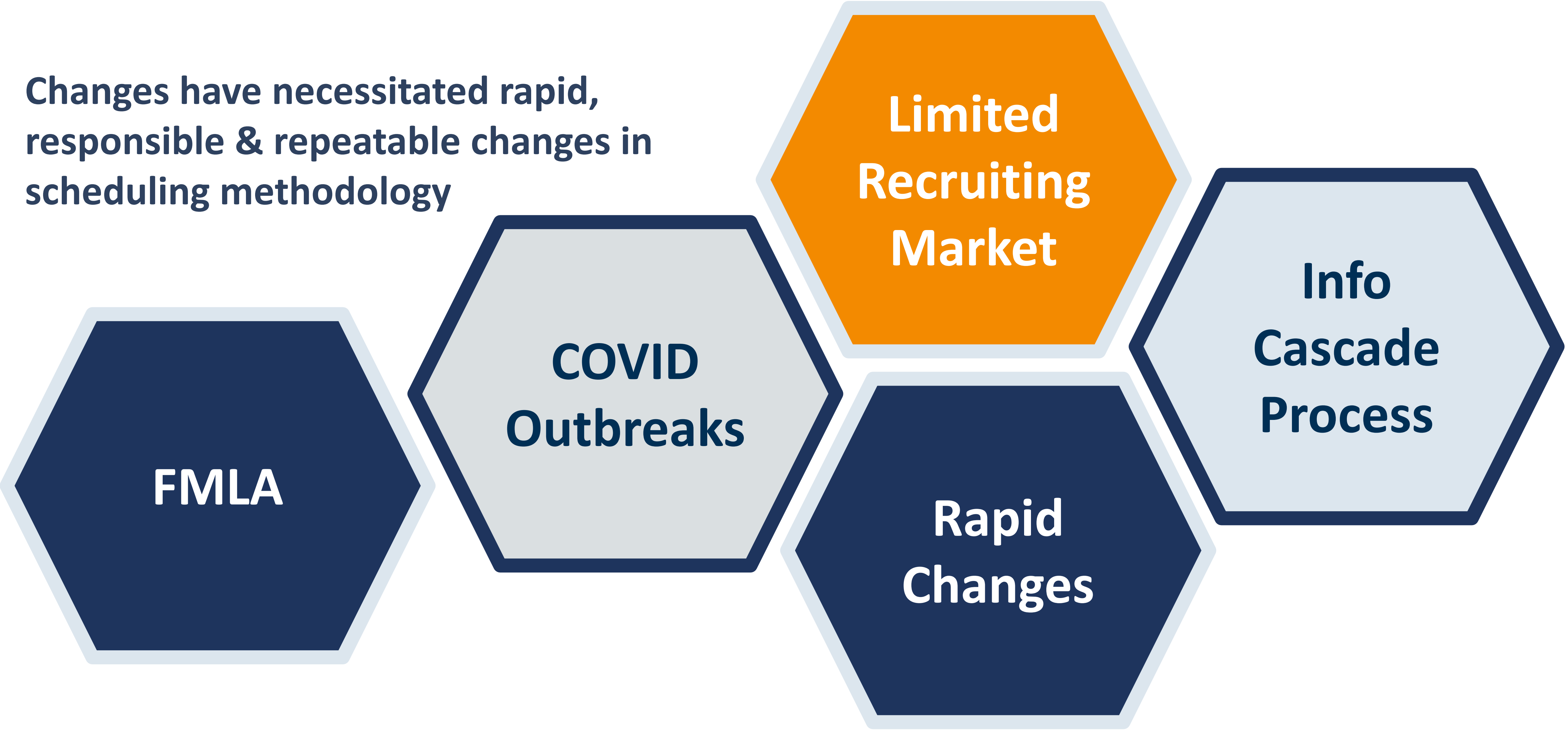
At the end of this session, participants should be able to:

1. Recall steps of scheduling deconstructions and theory
2. Recognize steps to leveraging and standardizing data for equitable department staffing
3. Identify unknown variables in departmental planning

Scheduling in Today’s Pharmacy

Scheduling in Today's Pharmacy

Changes have necessitated rapid, responsible & repeatable changes in scheduling methodology


Limited Recruiting Market
Info Cascade Process
COVID Outbreaks
FMLA
Rapid Changes

Reading Hospital Pharmacist Schedule

Historical Schedule Facts
32 Open Shifts every 2 weeks
3 Decentralized Pharmacists Day Shift M–F
Order Verification numbers range from under 150/shift to over 500/shift
Everyday features variable schedule
8-, 10-, 12- & 14-hour RPh positions

> “The secret of change is to focus all of your energy not on fighting the old, but on building the new.”
>
> **~Socrates**

Scheduling Deconstruction & Theory

Scheduling Deconstruction & Theory

Decision was made to target the 250–300 order range

Provides bandwidth to assist other teams & if shift becomes busier than anticipated

Teams will cover only their assigned floors & will be responsible for all care items

Staff will rotate through & around teams to facilitate continuity of care

Large Tertiary Care Medical Center

Houston, Texas

1,887,751 inpatient & outpatient medication orders

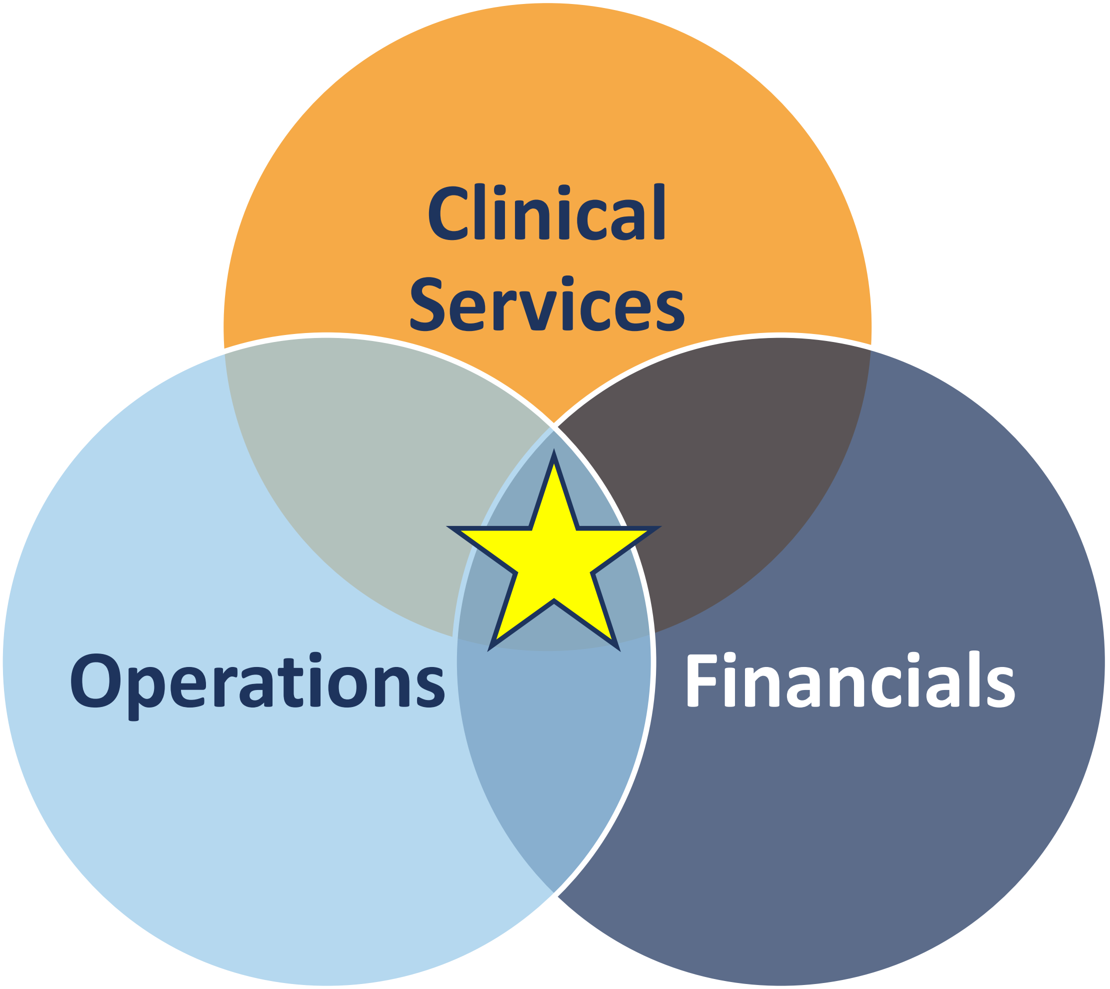
Orders Verified per Shift	Error Rate (per 100 shifts)
100–200	2.58
201–400	8.44
400 +	11.11

Source: Gorbach, C., Blanton, L., Lukawski, B. A., Varkey, A. C., Pitman, E. P., & Garey, K. W. (2015). Frequency of and risk factors for medication errors by pharmacists during order verification in a tertiary care medical center. *American Journal of Health-System Pharmacy*, *72*(17), 1471+.

New Schedule Goals

Planning for Success

- ✓ Safe order verification levels
- ✓ No open shifts upon schedule release
- ✓ Less weekend shifts
- ✓ Decreased ED Pharmacist volume
- ✓ Standardization
- ✓ Emphasis on flexibility and staff rotation
- ✓ Increased Decentralized Pharmacist presence
  - ✓ Evenings now included


Clinical Services
Operations
Financials

Interactive Question

What is half of

13

What is half of

13

6.5

What's half of

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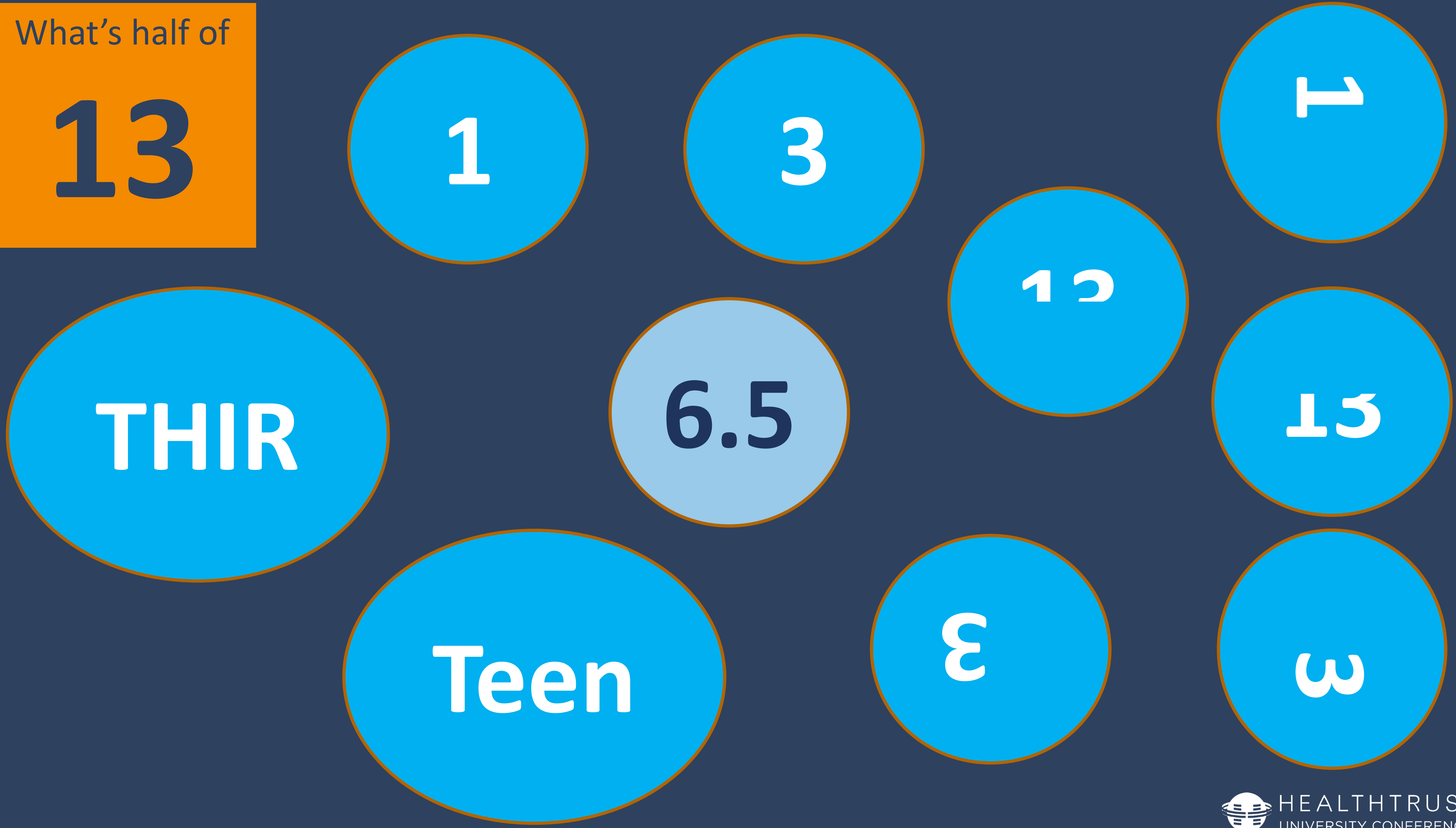
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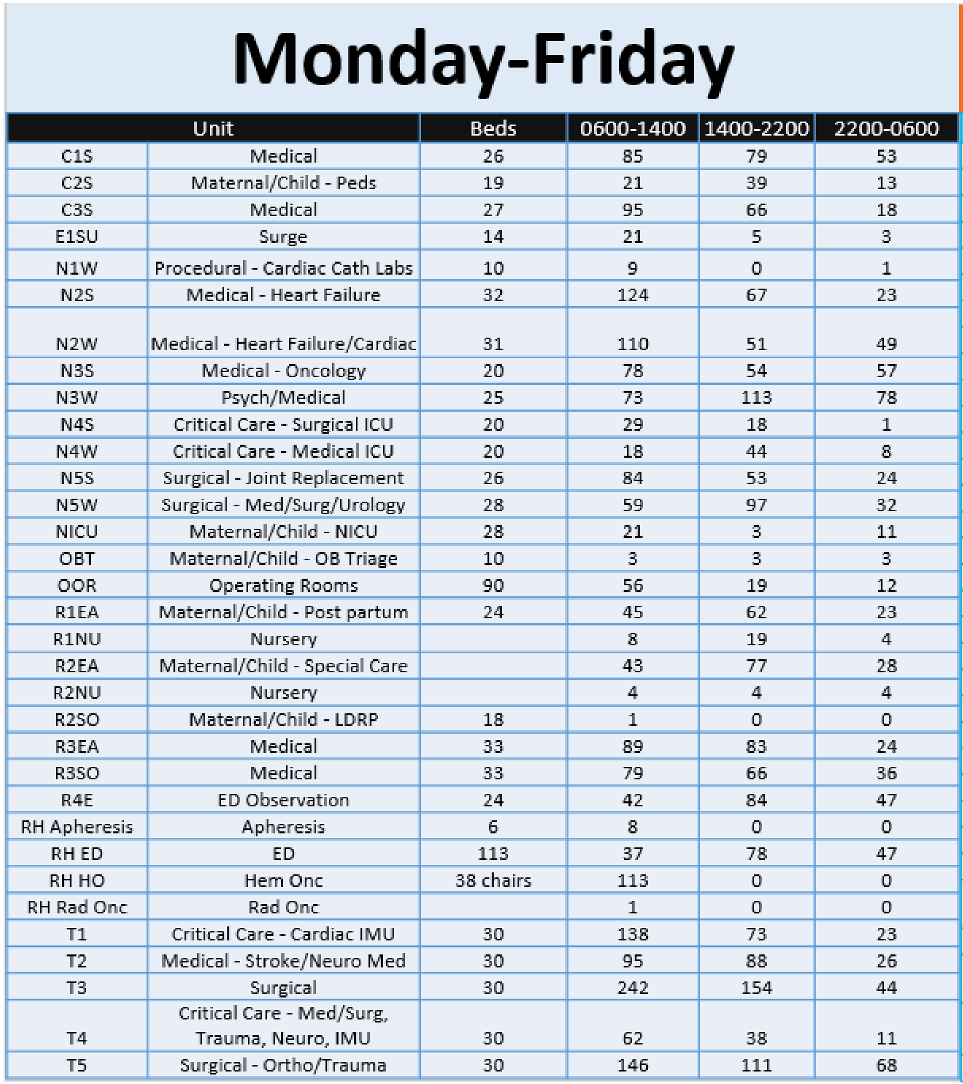
Leveraging Data to Determine Staffing Needs

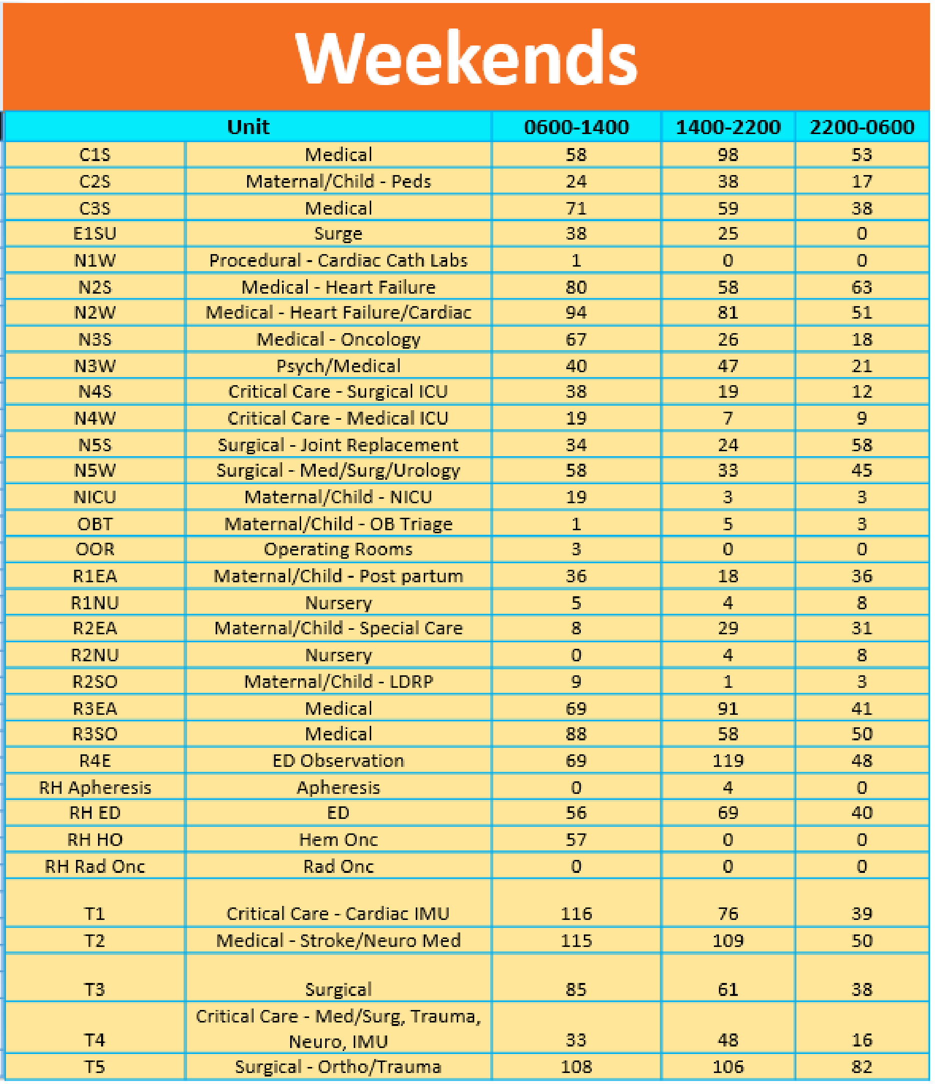
New Schedule Planning

Leveraging **Data** to Drive Efficiency



Monday-Friday

Unit		Beds	0600-1400	1400-2200	2200-0600
C1S	Medical	26	85	79	53
C2S	Maternal/Child - Peds	19	21	39	13
C3S	Medical	27	95	66	18
E1SU	Surge	14	21	5	3
N1W	Procedural - Cardiac Cath Labs	10	9	0	1
N2S	Medical - Heart Failure	32	124	67	23
N2W	Medical - Heart Failure/Cardiac	31	110	51	49
N3S	Medical - Oncology	20	78	54	57
N3W	Psych/Medical	25	73	113	78
N4S	Critical Care - Surgical ICU	20	29	18	1
N4W	Critical Care - Medical ICU	20	18	44	8
N5S	Surgical - Joint Replacement	26	84	53	24
N5W	Surgical - Med/Surg/Urology	28	59	97	32
NICU	Maternal/Child - NICU	28	21	3	11
OBT	Maternal/Child - OB Triage	10	3	3	3
OOR	Operating Rooms	90	56	19	12
R1EA	Maternal/Child - Post partum	24	45	62	23
R1NU	Nursery		8	19	4
R2EA	Maternal/Child - Special Care		43	77	28
R2NU	Nursery		4	4	4
R2SO	Maternal/Child - LDRP	18	1	0	0
R3EA	Medical	33	89	83	24
R3SO	Medical	33	79	66	36
R4E	ED Observation	24	42	84	47
RH Apheresis	Apheresis	6	8	0	0
RH ED	ED	113	37	78	47
RH HO	Hem Onc	38 chairs	113	0	0
RH Rad Onc	Rad Onc		1	0	0
T1	Critical Care - Cardiac IMU	30	138	73	23
T2	Medical - Stroke/Neuro Med	30	95	88	26
T3	Surgical	30	242	154	44
T4	Critical Care - Med/Surg, Trauma, Neuro, IMU	30	62	38	11
T5	Surgical - Ortho/Trauma	30	146	111	68



Weekends

Unit		0600-1400	1400-2200	2200-0600
C1S	Medical	58	98	53
C2S	Maternal/Child - Peds	24	38	17
C3S	Medical	71	59	38
E1SU	Surge	38	25	0
N1W	Procedural - Cardiac Cath Labs	1	0	0
N2S	Medical - Heart Failure	80	58	63
N2W	Medical - Heart Failure/Cardiac	94	81	51
N3S	Medical - Oncology	67	26	18
N3W	Psych/Medical	40	47	21
N4S	Critical Care - Surgical ICU	38	19	12
N4W	Critical Care - Medical ICU	19	7	9
N5S	Surgical - Joint Replacement	34	24	58
N5W	Surgical - Med/Surg/Urology	58	33	45
NICU	Maternal/Child - NICU	19	3	3
OBT	Maternal/Child - OB Triage	1	5	3
OOR	Operating Rooms	3	0	0
R1EA	Maternal/Child - Post partum	36	18	36
R1NU	Nursery	5	4	8
R2EA	Maternal/Child - Special Care	8	29	31
R2NU	Nursery	0	4	8
R2SO	Maternal/Child - LDRP	9	1	3
R3EA	Medical	69	91	41
R3SO	Medical	88	58	50
R4E	ED Observation	69	119	48
RH Apheresis	Apheresis	0	4	0
RH ED	ED	56	69	40
RH HO	Hem Onc	57	0	0
RH Rad Onc	Rad Onc	0	0	0
T1	Critical Care - Cardiac IMU	116	76	39
T2	Medical - Stroke/Neuro Med	115	109	50
T3	Surgical	85	61	38
T4	Critical Care - Med/Surg, Trauma, Neuro, IMU	33	48	16
T5	Surgical - Ortho/Trauma	108	106	82

- **Floors separated by orders verified**
- **Orders grouped into 8-hour shifts**
- **Teams created to reflect safe order verification levels**

New Schedule Design

Leveraging **Simplicity** to Drive Efficiency

- **Don’t lose focus on the objective**
- **Use the experts available to you**
- **Accept feedback**
- **Build without roster in mind**
- **Prepare to change**

Schedule (Noun)

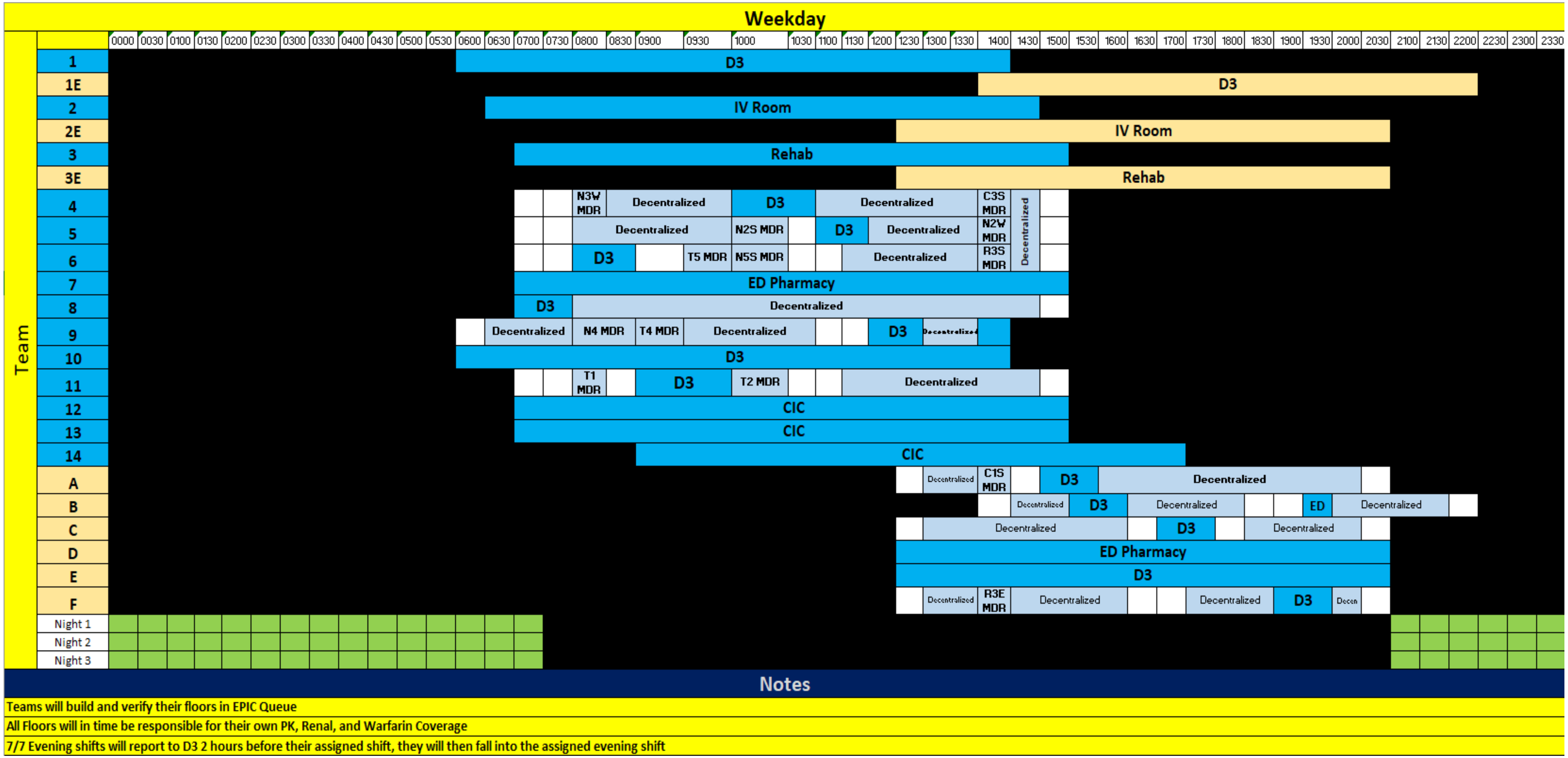
- A plan for carrying out a process or procedure, giving lists of intended events and times.

Source: Simpson, J. A., Weiner, E. S. C., & Oxford University Press. (1989). The Oxford English Dictionary. Oxford: Clarendon Press.

“Success consists of going from failure to failure without loss of enthusiasm.”
~Winston Churchill

New Schedule **Design**

Leveraging **Data** to Drive Efficiency



Weekday

Team	0000	0030	0100	0130	0200	0230	0300	0330	0400	0430	0500	0530	0600	0630	0700	0730	0800	0830	0900	0930	1000	1030	1100	1130	1200	1230	1300	1330	1400	1430	1500	1530	1600	1630	1700	1730	1800	1830	1900	1930	2000	2030	2100	2130	2200	2230	2300	2330
1													D3																																			
1E																													D3																			
2														IV Room																																		
2E																										IV Room																						
3															Rehab																																	
3E																										Rehab																						
4																	N3W MDR	Decentralized			D3		Decentralized						C3S MDR	Decentralized																		
5																	Decentralized				N2S MDR		D3		Decentralized				N2W MDR																			
6																	D3			T5 MDR	N5S MDR			Decentralized					R3S MDR																			
7															ED Pharmacy																																	
8															D3		Decentralized																															
9														Decentralized			N4 MDR		T4 MDR	Decentralized					D3		Decentralized																					
10													D3																																			
11																	T1 MDR		D3		T2 MDR			Decentralized																								
12															CIC																																	
13															CIC																																	
14																			CIC																													
A																											Decentralized		C1S MDR		D3		Decentralized															
B																														Decentralized		D3		Decentralized						ED	Decentralized							
C																											Decentralized								D3			Decentralized										
D																										ED Pharmacy																						
E																										D3																						
F																											Decentralized		R3E MDR	Decentralized						Decentralized			D3		Decen							
Night 1	🟩	🟩	🟩	🟩	🟩	🟩	🟩	🟩	🟩	🟩	🟩	🟩	🟩	🟩	🟩																												🟩	🟩	🟩	🟩	🟩	🟩
Night 2	🟩	🟩	🟩	🟩	🟩	🟩	🟩	🟩	🟩	🟩	🟩	🟩	🟩	🟩	🟩																												🟩	🟩	🟩	🟩	🟩	🟩
Night 3	🟩	🟩	🟩	🟩	🟩	🟩	🟩	🟩	🟩	🟩	🟩	🟩	🟩	🟩	🟩																												🟩	🟩	🟩	🟩	🟩	🟩

Notes

Teams will build and verify their floors in EPIC Queue

All Floors will in time be responsible for their own PK, Renal, and Warfarin Coverage

7/7 Evening shifts will report to D3 2 hours before their assigned shift, they will then fall into the assigned evening shift

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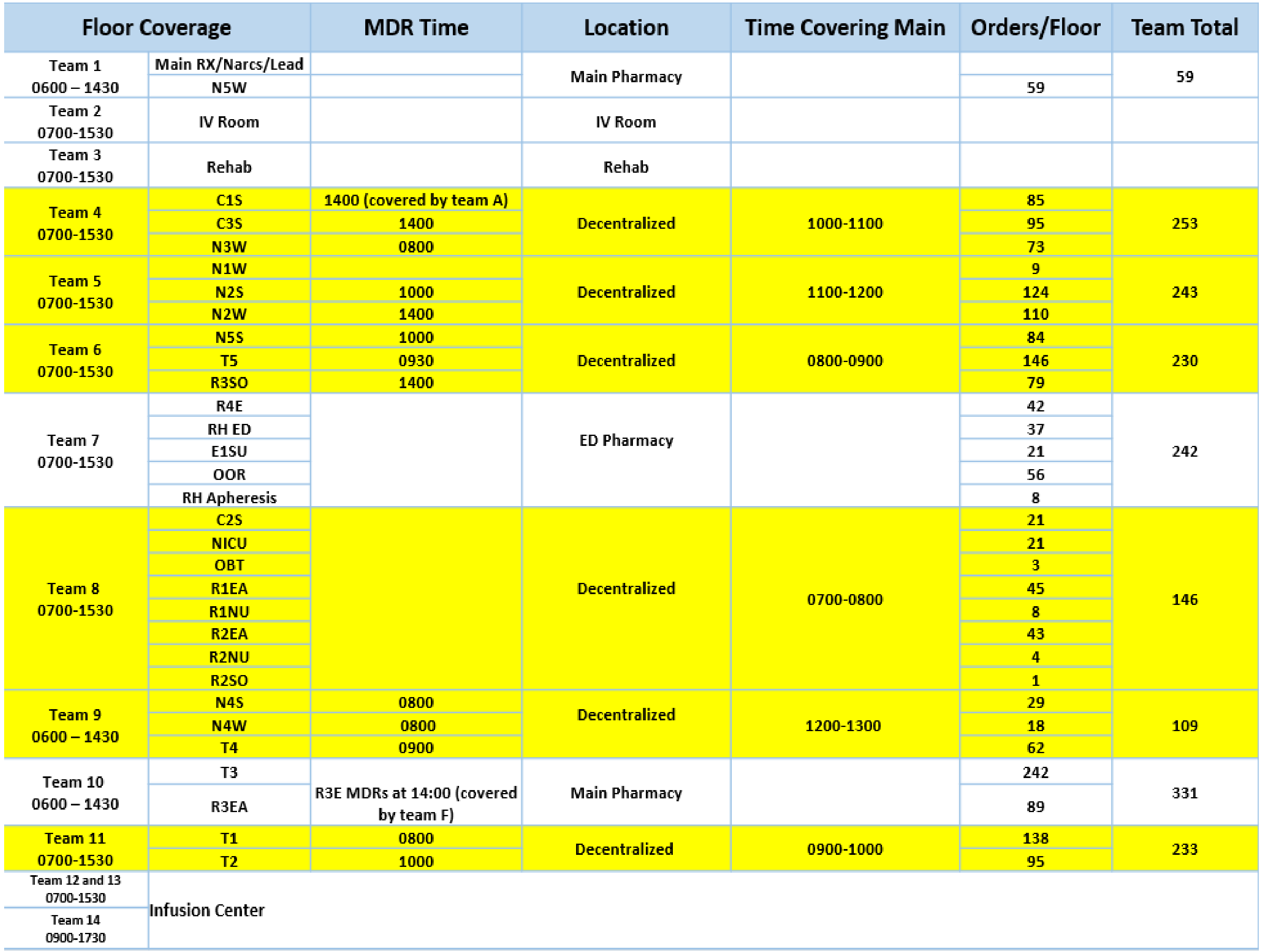
New Schedule Build

Using Input to Drive Output

Highlights

- Zero open shifts every two weeks
- 6 Decentralized Pharmacists day shift M–F
  - **Additional 3 Decentralized Pharmacists**
- Order verification numbers between 225 & 330 orders/shift*
- Standardized scheduling
- Only 8-hour Pharmacist positions



Floor Coverage		MDR Time	Location	Time Covering Main	Orders/Floor	Team Total
Team 1 0600 – 1430	Main RX/Narcs/Lead		Main Pharmacy			59
	N5W				59	
Team 2 0700-1530	IV Room		IV Room			
Team 3 0700-1530	Rehab		Rehab			
Team 4 0700-1530	C1S	1400 (covered by team A)	Decentralized	1000-1100	85	253
	C3S	1400			95	
	N3W	0800			73	
Team 5 0700-1530	N1W		Decentralized	1100-1200	9	243
	N2S	1000			124	
	N2W	1400			110	
Team 6 0700-1530	N5S	1000	Decentralized	0800-0900	84	230
	T5	0930			146	
	R3SO	1400			79	
Team 7 0700-1530	R4E		ED Pharmacy		42	242
	RH ED				37	
	E1SU				21	
	OOR				56	
	RH Apheresis				8	
Team 8 0700-1530	C2S		Decentralized	0700-0800	21	146
	NICU				21	
	OBT				3	
	R1EA				45	
	R1NU				8	
	R2EA				43	
	R2NU				4	
	R2SO				1	
Team 9 0600 – 1430	N4S	0800	Decentralized	1200-1300	29	109
	N4W	0800			18	
	T4	0900			62	
Team 10 0600 – 1430	T3	R3E MDRs at 14:00 (covered by team F)	Main Pharmacy		242	331
	R3EA				89	
Team 11 0700-1530	T1	0800	Decentralized	0900-1000	138	233
	T2	1000			95	
Team 12 and 13 0700-1530	Infusion Center					
Team 14 0900-1730						

New Schedule Communicated

Educate, Inform & Teach the Staff

- This is where most plans fail
- Programming established to break Pharmacists from comfort zone to encourage engagement on units
- 15 step training process with defined responsibilities to encourage collaborative interaction
- Daily tasks focused on patient engagement & HCAHPS improvements

	Training Objectives
1	**Rotate** through all units, spending time on each, only not on the units for centralized check time, and lunch/dinner
2	**Introduce** yourself as the pharmacist for the unit that day, placing your magnets on the floor whiteboard for the day
3	**Introduce** yourself to the Nursing Unit Director
4	**Counsel** 1 patient on a newly started medication
5	**Introduce** Pharmacy to 2 new patients (using brochure)
6	**Introduce** yourself to the Physicians on the floors
7	**Meet** the floor's assigned Case Manager(s)
8	**Address** 1-2 RN issues in person
9	**Introduce** Pharmacy to 4 new patients (using brochure)
10	**Counsel** 2 patients on newly started medications
11	**Write** 1 email to Direct Manager outlining how process is going
12	**Email** Director on 1 suggestion to improve process
13	**Create** 5 bullet points: Tips on being successful and share with Pharmacy Manager email group
14	**Counsel** 3 patients on newly started medications
15	**Introduce** Pharmacy to 5 new patients (using brochure)

New Schedule Communicated

Educate, Inform & Teach the Staff

- This is not the schedule for just today, this is built for the future

- Building a sustainable program to ensure patient care & staff development
  - **Rotate**
  - **Introduce**
  - **Counsel**

Source: How to Start a Movement? Leadership Lessons from Dancing Guy. (2010, October 29). [Video]. YouTube. https://www.youtube.com/watch?v=lbaemWIljeQ&t=53s

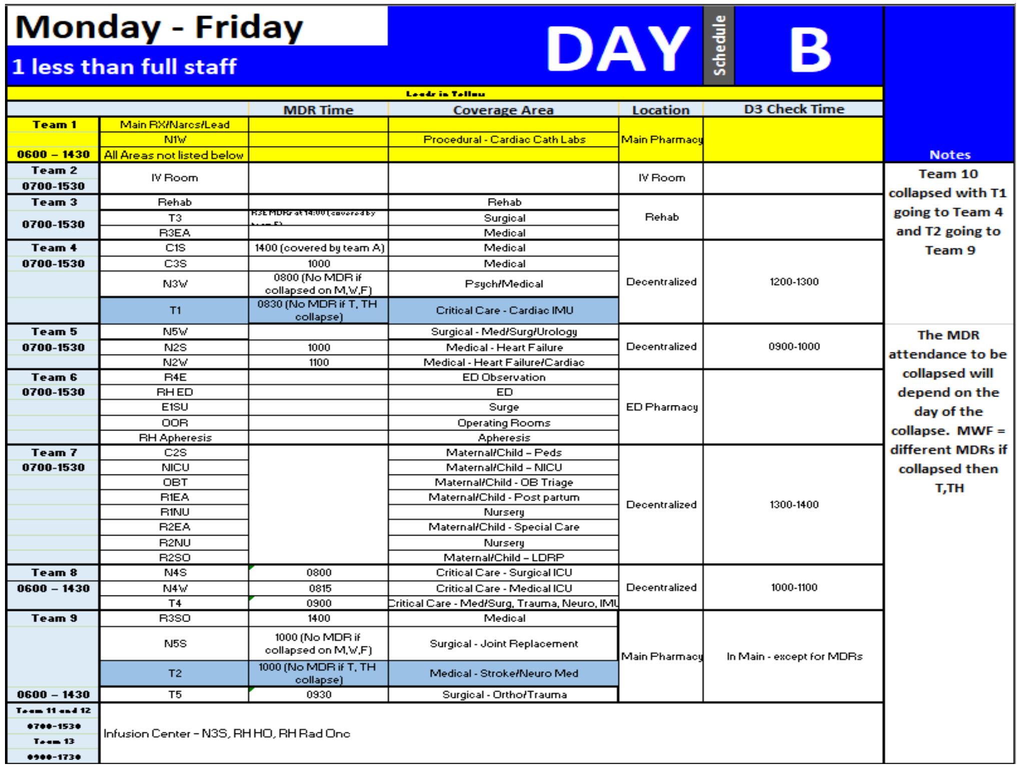
Defining Unknowns

New Schedule Flexibility

Engineered for Variability

- Multiple versions created to reflect variability in staffing coverage for both days & evenings
  - A
    - Down 1 Pharmacist
  - B
    - Down 2 Pharmacists
  - C
    - Down 3 Pharmacists
  - D
    - Down 4 Pharmacists
- Creates known variables during previously ill-defined operational plan

Day
Day
A
B
C
D
Cube
Scheduling


Monday - Friday

1 less than full staff

DAY Schedule **B**

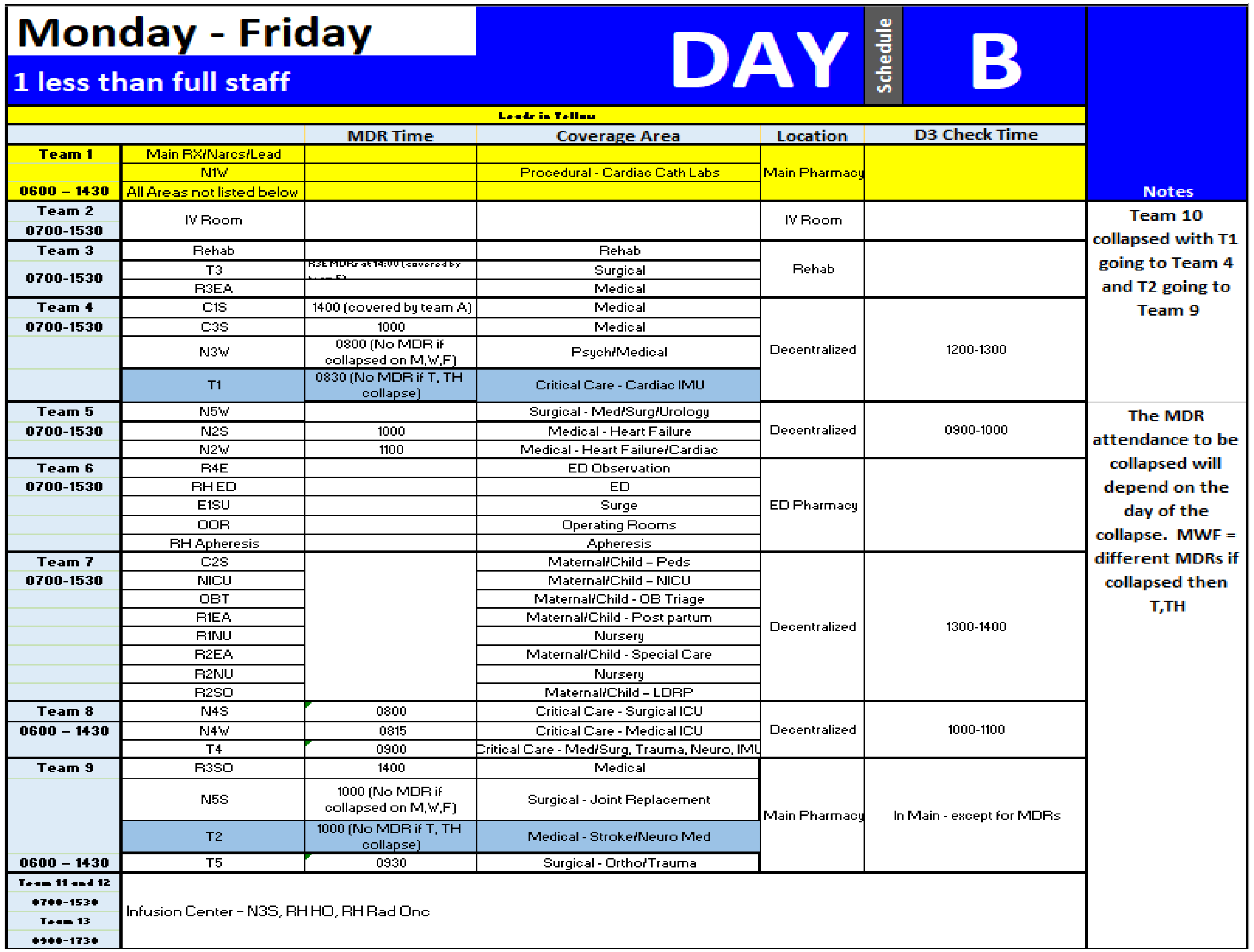
Leads in Yellow

		MDR Time	Coverage Area	Location	D3 Check Time	Notes
Team 1	Main RX/Narcs/Lead			Main Pharmacy		
	N1W		Procedural - Cardiac Cath Labs			
0600 – 1430	All Areas not listed below					
Team 2 0700-1530	IV Room			IV Room		Team 10 collapsed with T1 going to Team 4 and T2 going to Team 9
Team 3	Rehab		Rehab	Rehab		
0700-1530	T3	R3E MDRs at 14:00 (covered by team F)	Surgical			
	R3EA		Medical			
Team 4	C1S	1400 (covered by team A)	Medical	Decentralized	1200-1300	
0700-1530	C3S	1000	Medical			
	N3W	0800 (No MDR if collapsed on M,W,F)	Psych/Medical			
	T1	0830 (No MDR if T, TH collapse)	Critical Care - Cardiac IMU			
Team 5	N5W		Surgical - Med/Surg/Urology	Decentralized	0900-1000	The MDR attendance to be collapsed will depend on the day of the collapse. MWF = different MDRs if collapsed then T,TH
0700-1530	N2S	1000	Medical - Heart Failure			
	N2W	1100	Medical - Heart Failure/Cardiac			
Team 6	R4E		ED Observation	ED Pharmacy		
0700-1530	RH ED		ED			
	E1SU		Surge			
	OOR		Operating Rooms			
	RH Apheresis		Apheresis			
Team 7	C2S		Maternal/Child – Peds	Decentralized	1300-1400	
0700-1530	NICU		Maternal/Child – NICU			
	OBT		Maternal/Child - OB Triage			
	R1EA		Maternal/Child - Post partum			
	R1NU		Nursery			
	R2EA		Maternal/Child - Special Care			
	R2NU		Nursery			
	R2SO		Maternal/Child – LDRP			
Team 8	N4S	0800	Critical Care - Surgical ICU	Decentralized	1000-1100	
0600 – 1430	N4W	0815	Critical Care - Medical ICU			
	T4	0900	Critical Care - Med/Surg, Trauma, Neuro, IMU			
Team 9	R3SO	1400	Medical	Main Pharmacy	In Main - except for MDRs	
	N5S	1000 (No MDR if collapsed on M,W,F)	Surgical - Joint Replacement			
	T2	1000 (No MDR if T, TH collapse)	Medical - Stroke/Neuro Med			
0600 – 1430	T5	0930	Surgical - Ortho/Trauma			
Team 11 and 12 0700-1530 Team 13 0900-1730	Infusion Center – N3S, RH HO, RH Rad Onc					

New Schedule Flexibility

Engineered for Variability

Day
Day
Cube
A
B
C
D
Scheduling

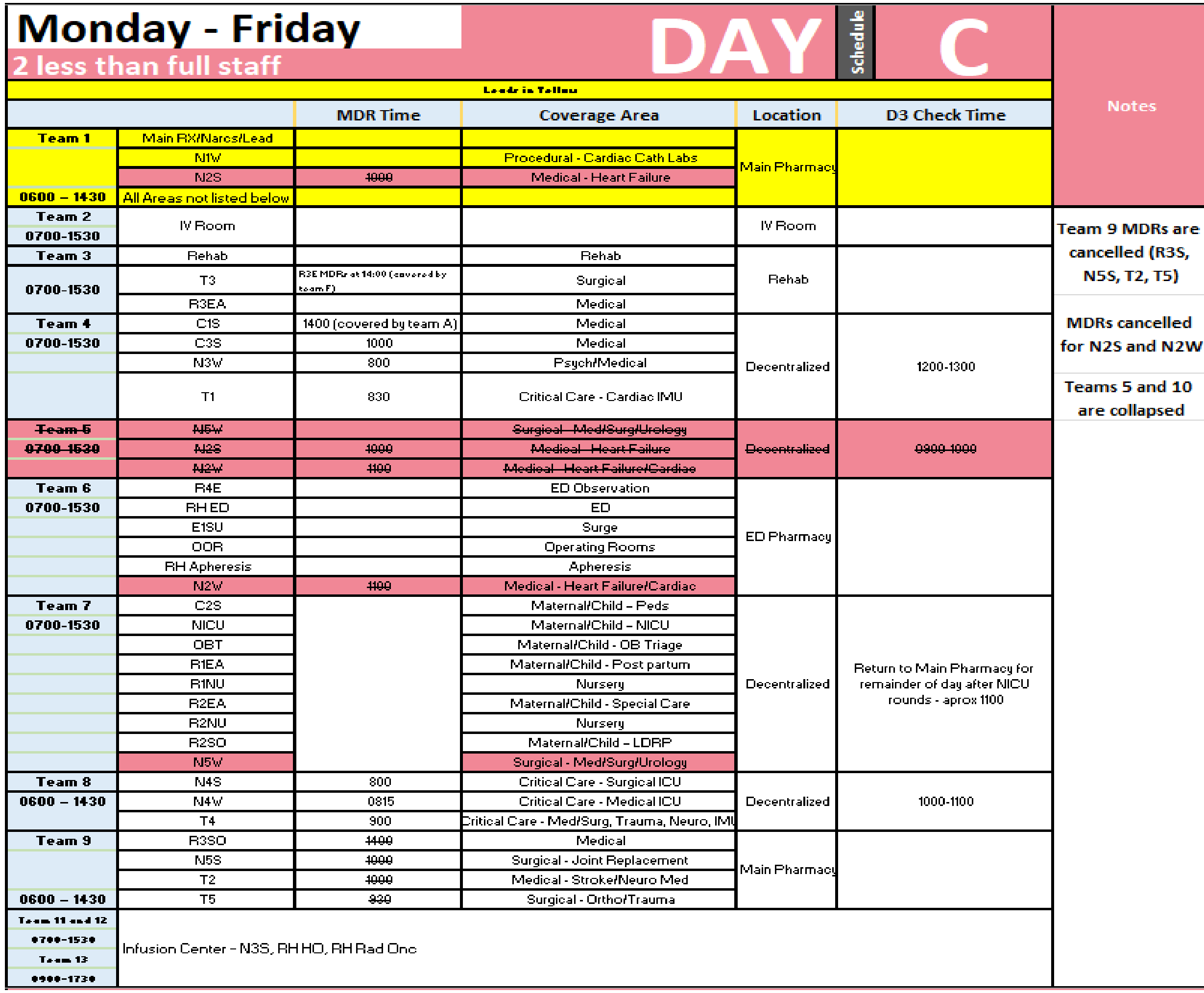


Monday - Friday — **DAY** Schedule **B**

1 less than full staff

Leads in Yellow

		MDR Time	Coverage Area	Location	D3 Check Time	Notes
Team 1	Main RX/Narcs/Lead			Main Pharmacy		
	N1W		Procedural - Cardiac Cath Labs			
0600 – 1430	All Areas not listed below					
Team 2 **0700-1530**	IV Room			IV Room		**Team 10 collapsed with T1 going to Team 4 and T2 going to Team 9**
Team 3	Rehab		Rehab	Rehab		
0700-1530	T3	R3E MDRs at 14:00 (covered by team F)	Surgical			
	R3EA		Medical			
Team 4	C1S	1400 (covered by team A)	Medical	Decentralized	1200-1300	
0700-1530	C3S	1000	Medical			
	N3W	0800 (No MDR if collapsed on M,W,F)	Psych/Medical			
	T1	0830 (No MDR if T, TH collapse)	Critical Care - Cardiac IMU			
Team 5	N5W		Surgical - Med/Surg/Urology	Decentralized	0900-1000	**The MDR attendance to be collapsed will depend on the day of the collapse. MWF = different MDRs if collapsed then T,TH**
0700-1530	N2S	1000	Medical - Heart Failure			
	N2W	1100	Medical - Heart Failure/Cardiac			
Team 6	R4E		ED Observation	ED Pharmacy		
0700-1530	RH ED		ED			
	E1SU		Surge			
	OOR		Operating Rooms			
	RH Apheresis		Apheresis			
Team 7	C2S		Maternal/Child – Peds	Decentralized	1300-1400	
0700-1530	NICU		Maternal/Child – NICU			
	OBT		Maternal/Child - OB Triage			
	R1EA		Maternal/Child - Post partum			
	R1NU		Nursery			
	R2EA		Maternal/Child - Special Care			
	R2NU		Nursery			
	R2SO		Maternal/Child – LDRP			
Team 8	N4S	0800	Critical Care - Surgical ICU	Decentralized	1000-1100	
0600 – 1430	N4W	0815	Critical Care - Medical ICU			
	T4	0900	Critical Care - Med/Surg, Trauma, Neuro, IMU			
Team 9	R3SO	1400	Medical	Main Pharmacy	In Main - except for MDRs	
	N5S	1000 (No MDR if collapsed on M,W,F)	Surgical - Joint Replacement			
	T2	1000 (No MDR if T, TH collapse)	Medical - Stroke/Neuro Med			
0600 – 1430	T5	0930	Surgical - Ortho/Trauma			
Team 11 and 12 **0700-1530** **Team 13** **0900-1730**	Infusion Center – N3S, RH HO, RH Rad Onc					



Monday - Friday — **DAY** Schedule **C**

2 less than full staff

Leads in Yellow

		MDR Time	Coverage Area	Location	D3 Check Time	Notes
Team 1	Main RX/Narcs/Lead			Main Pharmacy		
	N1W		Procedural - Cardiac Cath Labs			
	N2S	~~1000~~	Medical - Heart Failure			
0600 – 1430	All Areas not listed below					
Team 2 **0700-1530**	IV Room			IV Room		**Team 9 MDRs are cancelled (R3S, N5S, T2, T5)**
Team 3	Rehab		Rehab	Rehab		
0700-1530	T3	R3E MDRs at 14:00 (covered by team F)	Surgical			
	R3EA		Medical			
Team 4	C1S	1400 (covered by team A)	Medical	Decentralized	1200-1300	**MDRs cancelled for N2S and N2W**
0700-1530	C3S	1000	Medical			
	N3W	800	Psych/Medical			
	T1	830	Critical Care - Cardiac IMU			**Teams 5 and 10 are collapsed**
~~**Team 5**~~	~~N5W~~		~~Surgical - Med/Surg/Urology~~	~~Decentralized~~	~~0900-1000~~	
~~**0700-1530**~~	~~N2S~~	~~1000~~	~~Medical - Heart Failure~~			
	~~N2W~~	~~1100~~	~~Medical - Heart Failure/Cardiac~~			
Team 6	R4E		ED Observation	ED Pharmacy		
0700-1530	RH ED		ED			
	E1SU		Surge			
	OOR		Operating Rooms			
	RH Apheresis		Apheresis			
	N2W	~~1100~~	Medical - Heart Failure/Cardiac			
Team 7	C2S		Maternal/Child – Peds	Decentralized	Return to Main Pharmacy for remainder of day after NICU rounds - aprox 1100	
0700-1530	NICU		Maternal/Child – NICU			
	OBT		Maternal/Child - OB Triage			
	R1EA		Maternal/Child - Post partum			
	R1NU		Nursery			
	R2EA		Maternal/Child - Special Care			
	R2NU		Nursery			
	R2SO		Maternal/Child – LDRP			
	N5W		Surgical - Med/Surg/Urology			
Team 8	N4S	800	Critical Care - Surgical ICU	Decentralized	1000-1100	
0600 – 1430	N4W	0815	Critical Care - Medical ICU			
	T4	900	Critical Care - Med/Surg, Trauma, Neuro, IMU			
Team 9	R3SO	~~1400~~	Medical	Main Pharmacy		
	N5S	~~1000~~	Surgical - Joint Replacement			
	T2	~~1000~~	Medical - Stroke/Neuro Med			
0600 – 1430	T5	~~930~~	Surgical - Ortho/Trauma			
Team 11 and 12 **0700-1530** **Team 13** **0900-1730**	Infusion Center – N3S, RH HO, RH Rad Onc					

Educating & Owning a New Process

New Schedule Sell

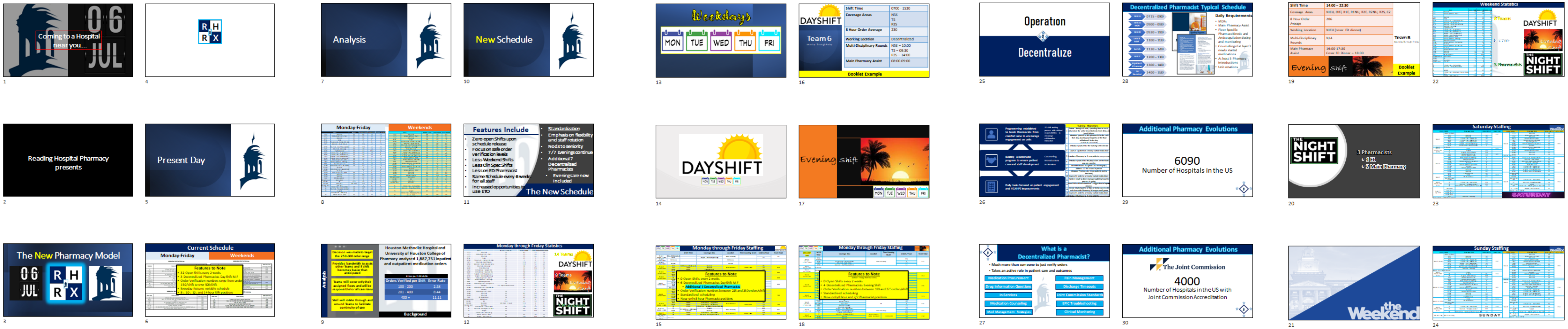
Communication is key

Coming to a Hospital near you....

New Schedule Sell, continued

Communication is key

CORE	Alan	Jim	Maegan	Maria	Bryan	Joe	Rich	Tim
	Fiscal Year Quarter Assigned							
Communication	1	2	3	4	1	2	3	4
Optimization	2	3	4	1	2	3	4	1
Recognition	3	4	1	2	3	4	1	2
Education	4	1	2	3	4	1	2	3


Coming to a Hospital near you...
Analysis
New Schedule
Weekdays
DAYSHIFT
Operation Decentralize
Decentralized Pharmacist Typical Schedule
Reading Hospital Pharmacy presents
Present Day
Monday-Friday
Weekends
Features Include
The New Schedule
Evening shift
Additional Pharmacy Evolutions
6090
Number of Hospitals in the US
NIGHT SHIFT
Saturday Staffing
The New Pharmacy Model
Current Schedule
Monday through Friday Statistics
Monday through Friday Staffing
What is a Decentralized Pharmacist?
4000
Number of Hospitals in the US with Joint Commission Accreditation
the Weekend
Sunday Staffing

Cube Scheduling | The Results

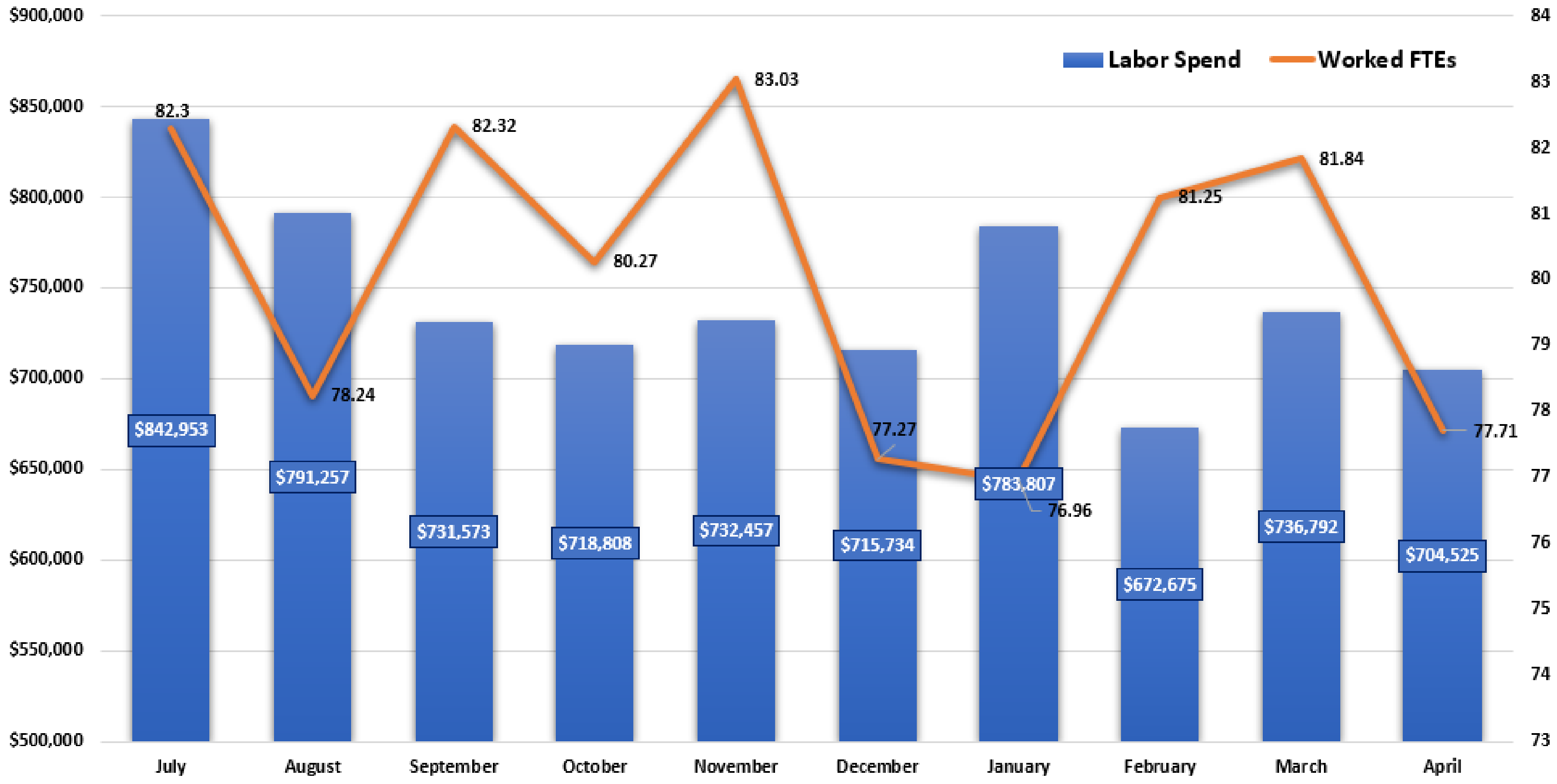
Cube Scheduling | The Results

- Fully implemented for Pharmacists in August 2021
- **2.5%** Pharmacist turnover since inception
- Increased:
  - Overtime pick up
  - Committee attendance
  - Morale
  - Ownership
  - Training opportunities
  - Vacation spots for staff
- **Decreased LOS Index** (0.98 – 0.95)
  - Targeted CHF/COPD/DM

Staff Comments

- *"This removes thinking & helps with doing."*
- *"It's nice to be able to comfortably work even when we are short staff."*
- *"This is great. Why didn't you do this sooner?"*

Cube Scheduling | The Results, continued



Average Monthly Labor Savings

$99,895

Average Monthly Worked FTE Counts

Down 2.3

Allowed for Pharmacy Structure Reorganization

HEALTHTRUST UNIVERSITY CONFERENCE

Cube Scheduling | Lessons Learned

Cube Scheduling | Lessons Learned

- Celebrate the staff
- Be highly visible
- Transparency through change is paramount
- Simple changes after thorough analysis can have lasting positive impact

Fortitudine Vincimus

"By endurance, we conquer."

Cube Scheduling | Pharmacy Optimization

References

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2. How to Start a Movement? Leadership Lessons from Dancing Guy. (2010, October 29). [Video]. YouTube. https://www.youtube.com/watch?v=lbaemWIljeQ&t=53s
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5. Simpson, J. A., Weiner, E. S. C., & Oxford University Press. (1989). The Oxford English Dictionary. Oxford: Clarendon Press.

Thank you…

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