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Creating Your Own Crystal Ball



Workload and Flow Modeling Software



OUTLINE

- ▶ Why simple equation for estimating staffing needs fall short.
- ▶ Factoring in Complexity Factors.
- ▶ Using historical data only tells you what happened in the past. (past performance does not guarantee future earns)
- ▶ The Crystal Ball - Trending the Future with Discrete Event Modeling Software.



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Basic Estimates

- ▶ Daily Admission x Length of Stay = Daily Census
- ▶ Knowing an estimated daily census allows you to estimate staffing needs based on group and individual preferences.



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“People are very open-minded about new things - as long as they're exactly like the old ones.”

Charles Kettering



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The change I want to discuss is something you already know.

- ▶ It is time to look outside the basic equations we use and start to include as many key complexity factors in the equation that we can think of so we can begin to see why things systemically happen the way they do.
- ▶ With a more extensive understanding of how and why our programs work and why the system seems to be in a constant flux while nothing seems to change. Then we will have the power to impact the constant flux for ours and our patients betterment.



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Power to Impact the Constant Flux.

If the events that created a process have changed then it is time to change the process.



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Is Daily Census all you need?



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Daily Census Doesn't Accurately Describe the Work

- ▶ Dr. A - carries an average daily census of 10 pts.
- ▶ Dr. A - on average admits 3 pts/day, therefore discharges 3 pts/day.

- ▶ Dr. B - carries an average daily census of 10 pts.
- ▶ Dr. B - on average admits 1 pts/day, therefore discharges 1 pts/day.



How do we compare Dr. A & Dr. B?

- ▶ How much work is it to round on patients?
- ▶ How much work is it to teach?
- ▶ How much work is it to admit a new patient?
- ▶ How much work is it to discharge a patient?
- ▶ How much work is added with age, co-morbidities, transfer of care, co-management?



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Full-time Equivalent (FTE)

- ▶ FTE is a common definition of what work is being done on the doctors side of the equation.
- ▶ FTE's objectifies the work into a numerical representation.
- ▶ FTE's become a common currency that empowers and allows us to compare, discuss and barter with administration and government.



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**Is your definition of a
FTE working for you or
against you.**



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The Devil is in the Details

- ▶ The Key to using FTE's is having a definition for FTE which clearly represents the work which is actually being done.
- ▶ FTE's are only as useful as the are the Fine Detail they represent



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Common Currency = FTE

- ▶ FTE = Full-time Equivalent
- ▶ This becomes the common currency by which you can discuss and barter over.
- ▶ FTE's are not static numbers - they change based on complexity factors
- ▶ i.e. Rounding on 3 patients during a weekday = 1 hours work
8 hours/day for 241 days/year (daytime work) is equals 1.0 FTE.
(this does not factor in evenings and weekends worked in the 24/7 setting of an acute care facility)
 - 8 hrs/day x 241days = 1928 hrs (once you know what your province has determined a 1.0 FTE family doctor in that province makes you can calculate what a hospitalist should be making per hour of work.



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Accounting for Complexity Factors

- ▶ Complexity of Patients and Families.
- ▶ Teaching Students and Educating Staff and Families.
- ▶ Admitting and Discharging Patients takes more time and skill than rounding on patients waiting for LTC.
- ▶ LOS, Co-morbidities and Patient Acuity.
- ▶ Quality Improvement, Administration, Forms, Urgent Callbacks, Phone Calls.



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What Has Been Missing?

- ▶ The ability to multiply complexity factors into the equation
- ▶ The ability to compare and contrast daily workloads using a common currency.
- ▶ The ability to combine complex workload equations with discrete event simulating software
- ▶ The ability to use this historical data to look to the future.



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The Key Missing Piece?

The ability to use FTE's and Historical Data to accurately predict how changes will affect our future.

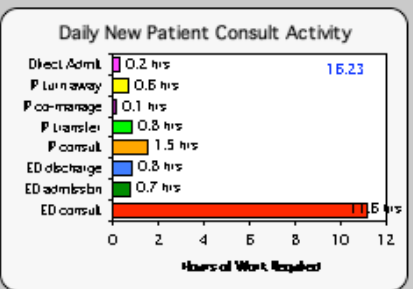
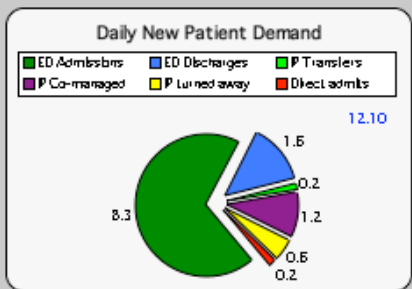


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New Patient	ED	ED consult requests per day	9.9
		ED day admission rate	84%
	P	P Consults per day	2
		P Transfer rate	10%
		P co-manage rate	80%
Direct	Direct Admits per day	0.2	

Daily Number of patients	ED Admissions	8.3
	ED Discharges	1.6
	P Transfers	0.2
	P Co-managed	1.2
	P Turned away	0.6
	Direct Admits	0.2
12.10		

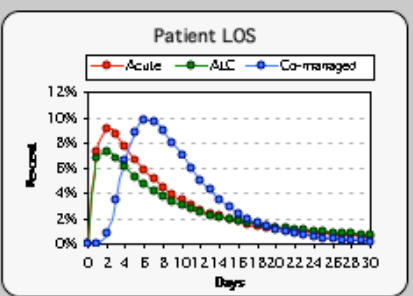
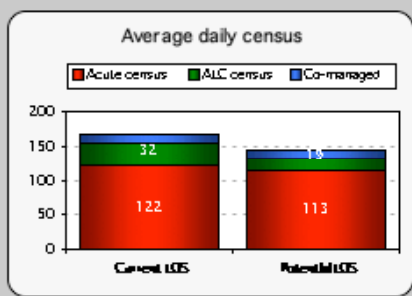


Consult Duration	ED	ED consult duration	70 mh
		ED admission duration	5 mh
		ED discharge duration	30 mh
	Acute P	P Consult duration	45 mh
		P Transfer duration	30 mh
		P co-manage duration	30 mh
		P Turn away duration	30 mh
Direct	Direct Admit duration	60 mh	

Daily Consult Activity	ED consult	11.6 hrs
	ED admission	0.7 hrs
	ED discharge	0.8 hrs
	P consult	1.5 hrs
	P Transfer	0.8 hrs
	P co-manage	0.1 hrs
	P Turn away	0.6 hrs
	Direct Admit	0.2 hrs
	Total	16.23

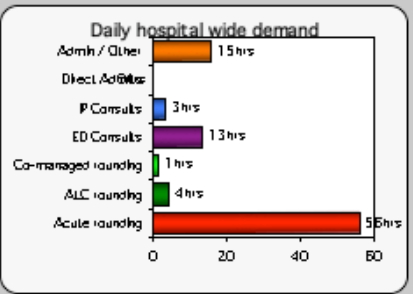
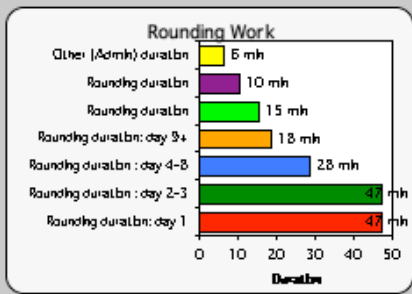
IP LOS	Acute	Average Acute LOS	14.0
		Std Dev Acute LOS	22.7
	ALC	Percent of patients becoming ALC	15%
		Average ALC LOS	24.4
		Std Dev ALC LOS	55.0
	Co-manage	Average Co-manage LOS	10.0
		Std Dev Co-manage LOS	6.0
	Potential	Potential change in acute LOS (+/-)	-1.0
	Potential change in ALC LOS (+/-)	-10.0	
	Potential change in Co-manage LOS (+/-)	0.0	

Daily Acute Admits	Daily acute admits	8.7
	Daily acute discharges	7.4
	Avg acute census	122.0
	Daily move to ALC	1.3
	Daily ALC discharges	1.3
	Avg ALC census	31.9
	Avg Co-managed census	12.0
	Potential acute census	113.3
	Potential ALC census	18.8
	Potential Co-manage census	12.0



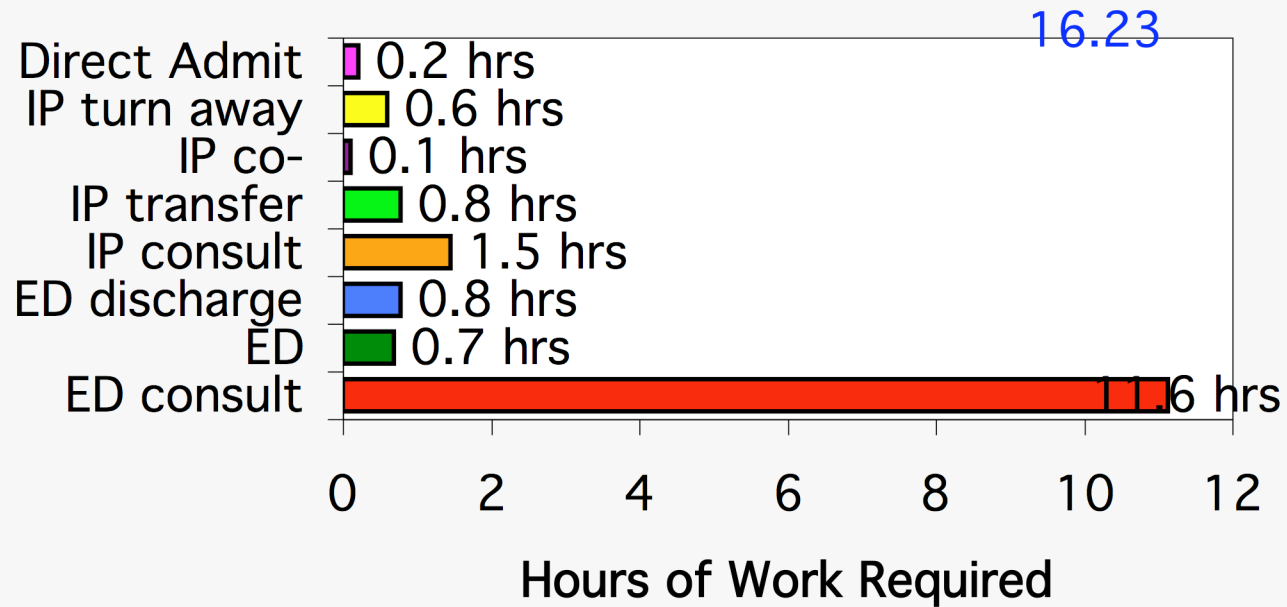
Inpatient Demand	Acute	Rounding duration: day 1	47 mh
		Rounding duration: day 2-3	47 mh
		Rounding duration: day 4-8	28 mh
		Rounding duration: day 9+	18 mh
		MB acuity %	40%
		Medium acuity %	50%
	Severe acuity %	10%	
	MB acuity multiple	0.90	
	Medium acuity multiple	1.00	
	Severe acuity multiple	1.10	
	ALC	Rounding duration	15 mh
		Rounding frequency	0.50
	Co-Managed	Rounding duration	10 mh
		Rounding frequency	0.50
	Other	Other (Admin) duration	6 mh
	Frequency	1.00	

Daily Totals	Acuity Factor	0.97
	Rounding time: day 1	6.8
	Rounding time: day 2-3	16.5
	Rounding time: day 4-8	16.4
	Rounding time: day 9+	16.1
	Acute rounding	55.7
	ALC rounding	4.0
	Co-managed rounding	1.0
	ED Consults	13.0
	P Consults	3.0
Direct Admits	0.20	
Admin / Other	15.4	
Total Daily Hours	92.3	



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Daily New Patient Consult Activity

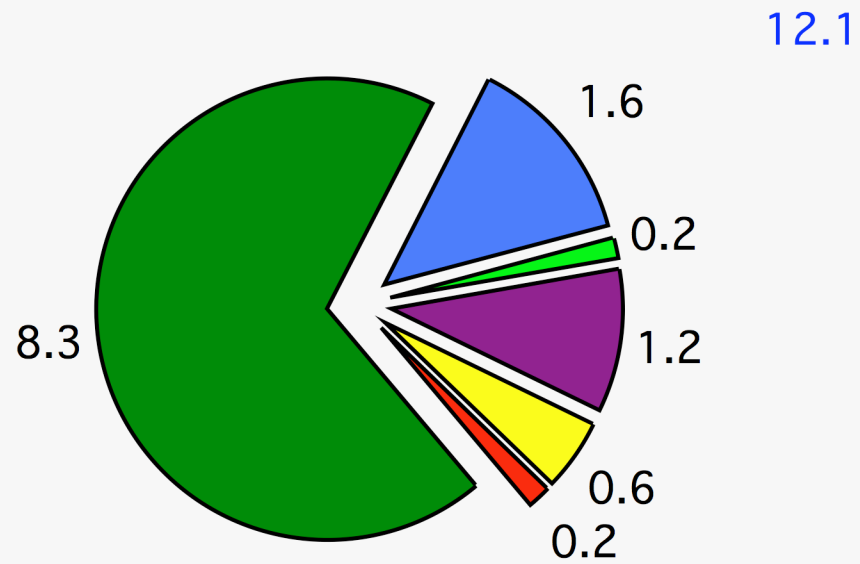


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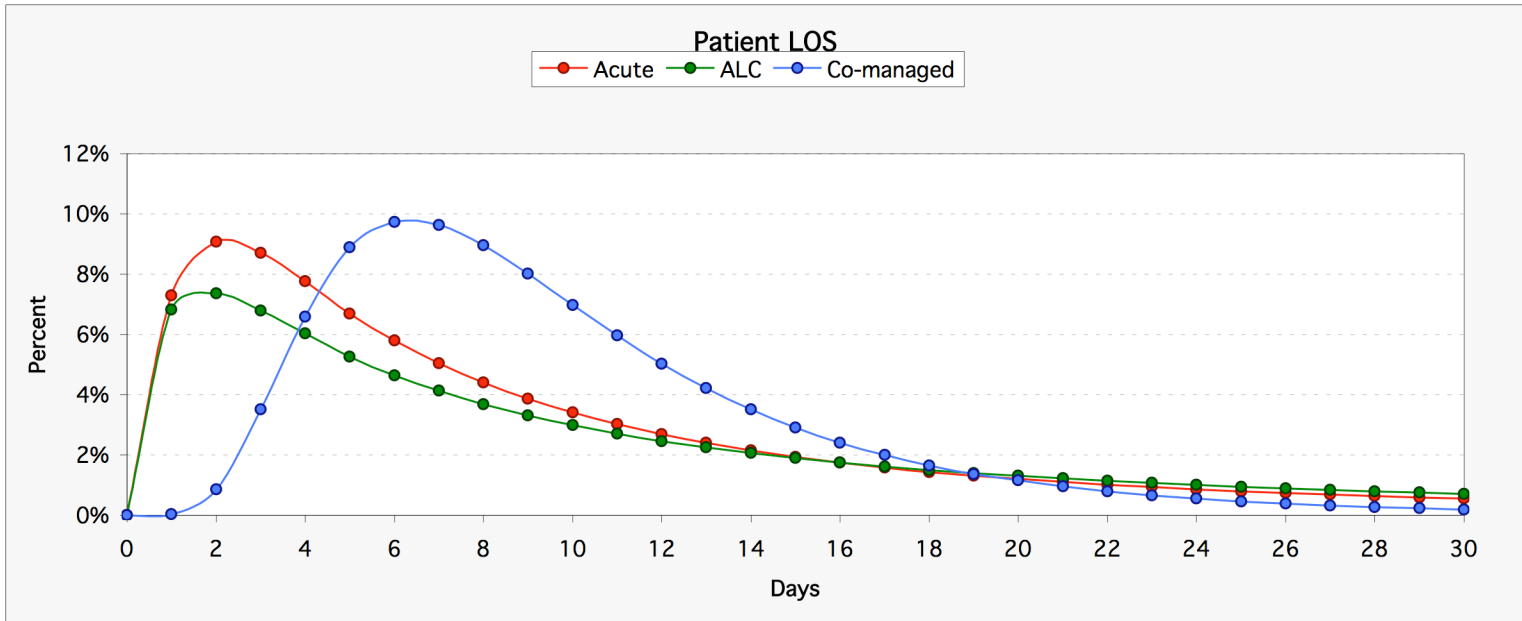
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Daily New Patient Demand

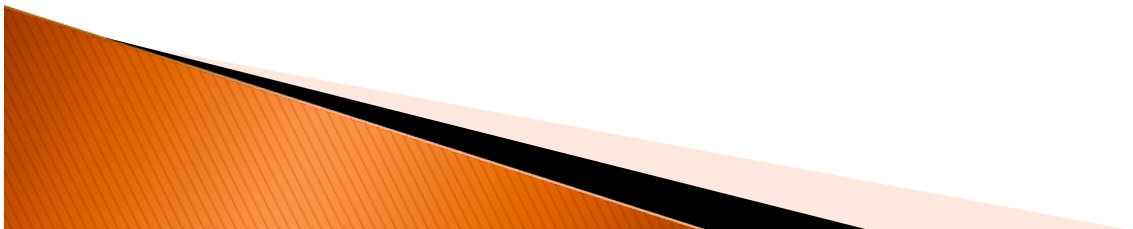
■ ED Admissions ■ ED Discharges ■ IP Transfers
■ IP Co-managed ■ IP turned away ■ Direct admits

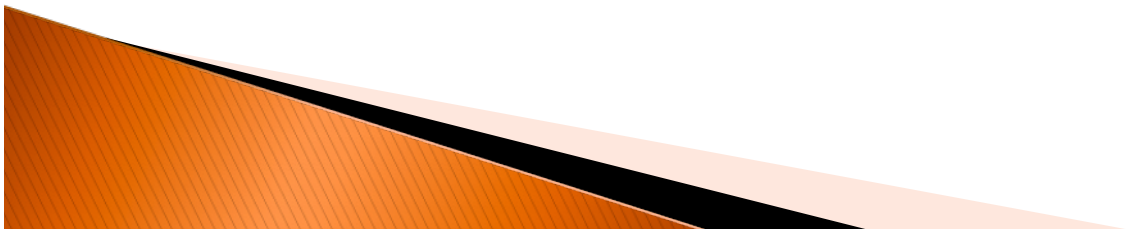
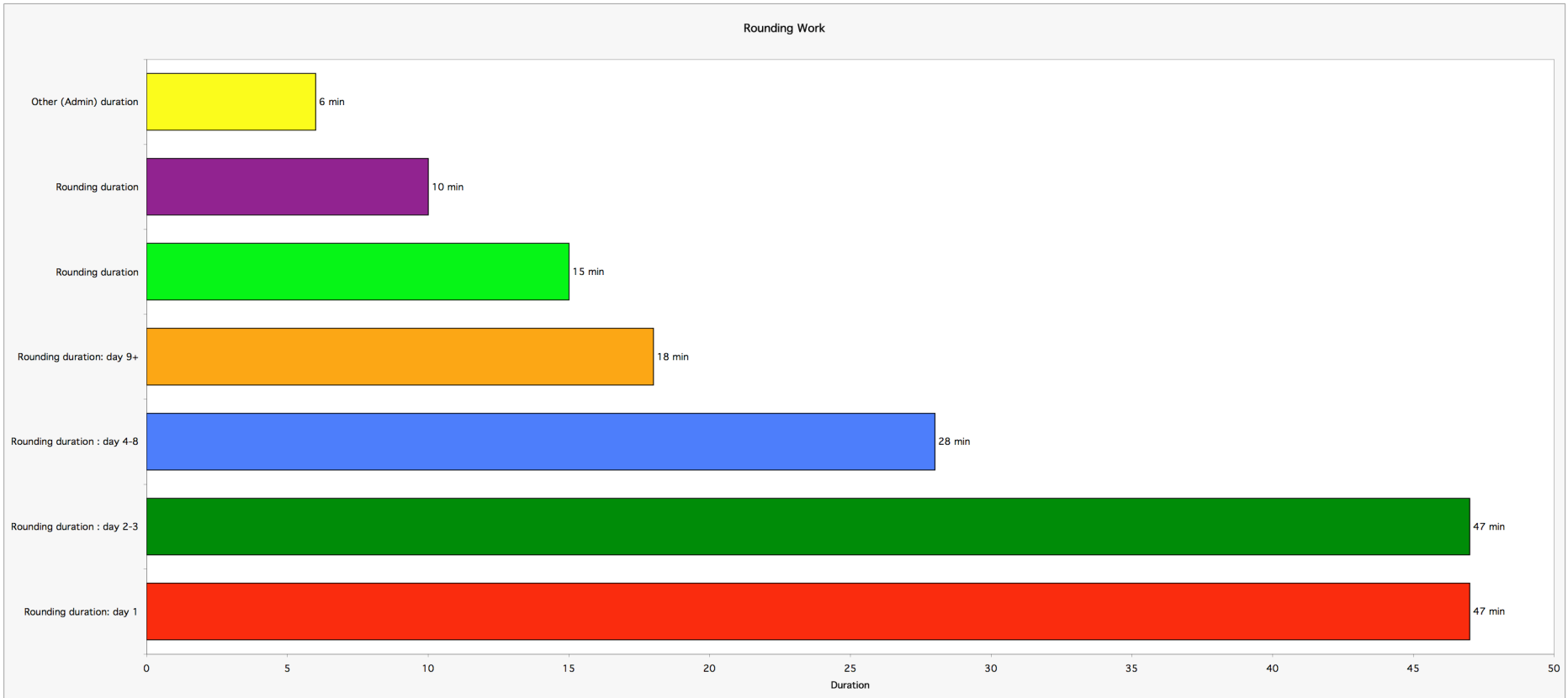


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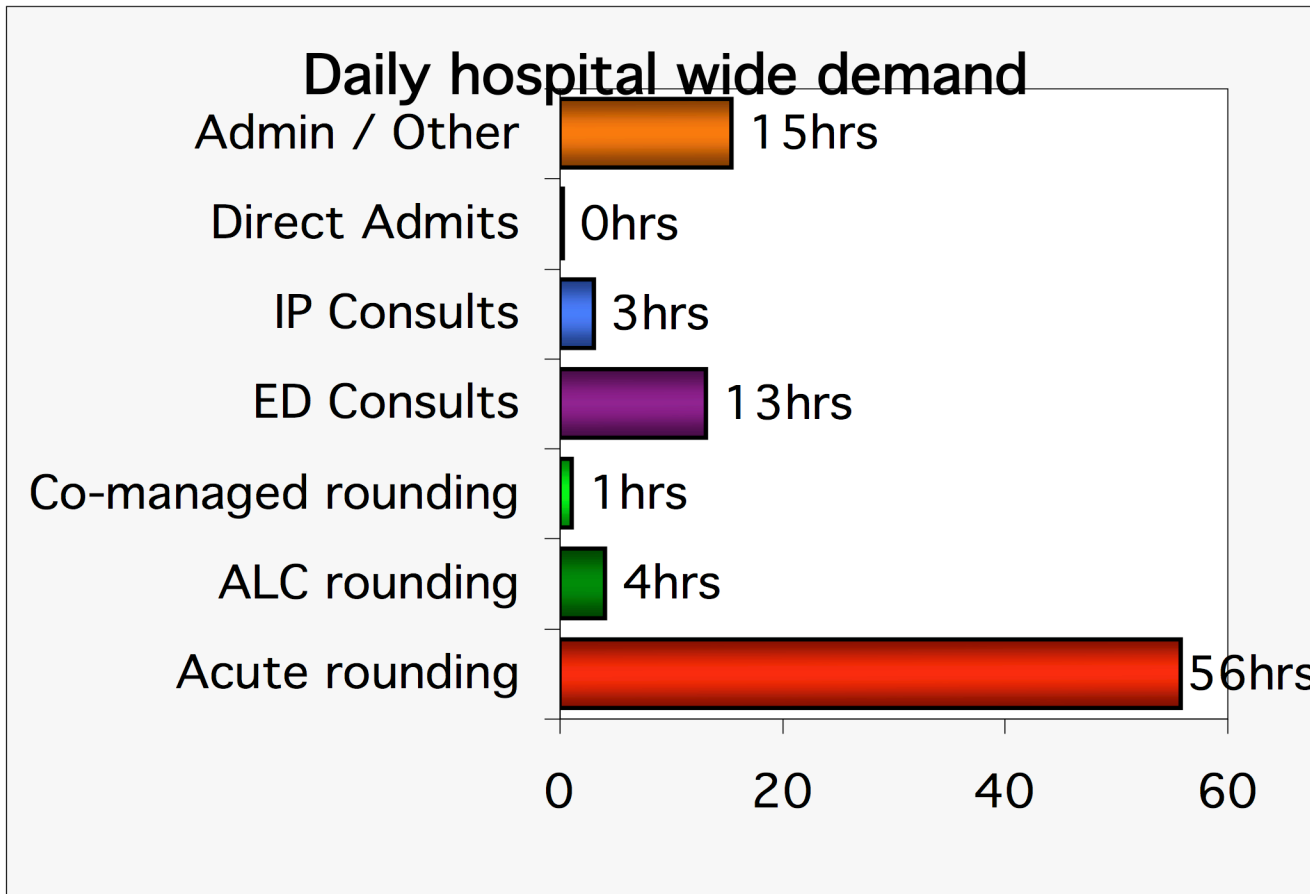


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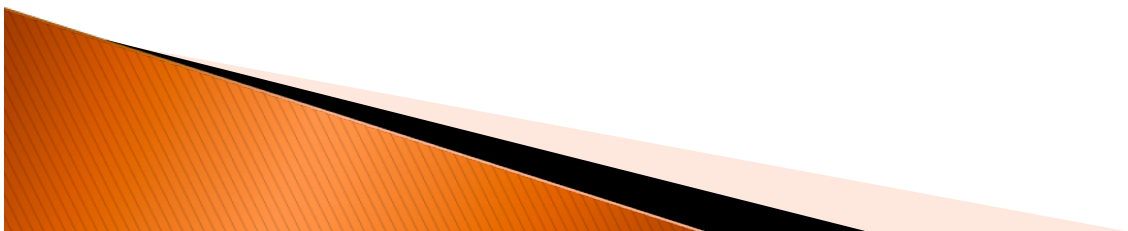


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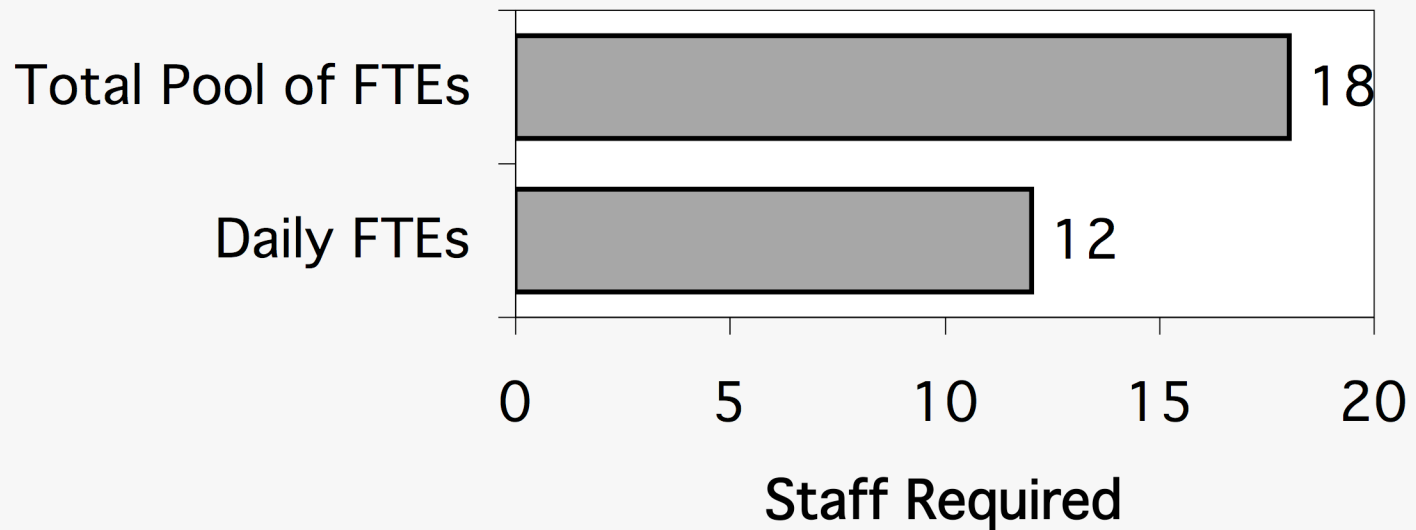


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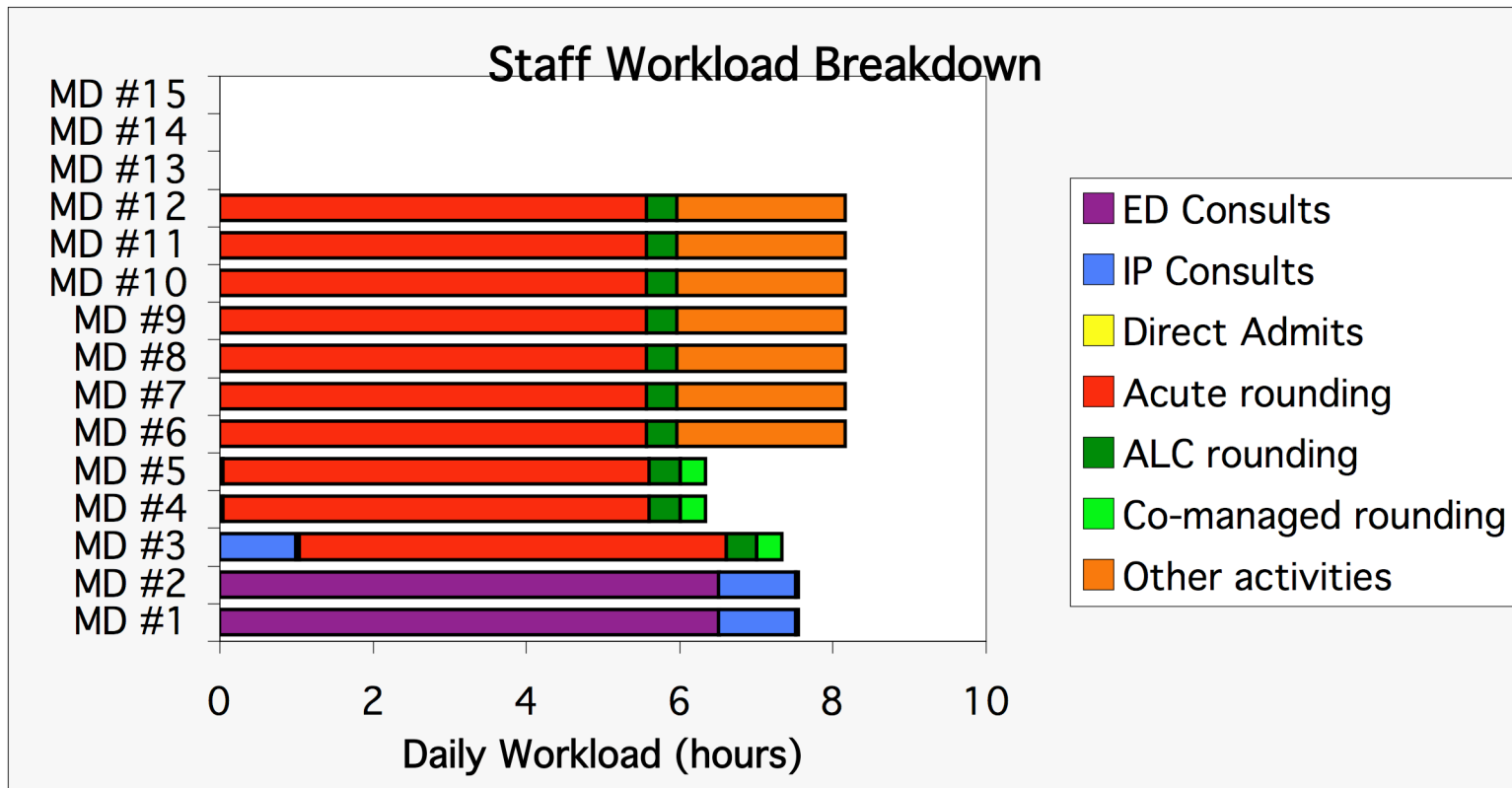


Minimum Staff Required

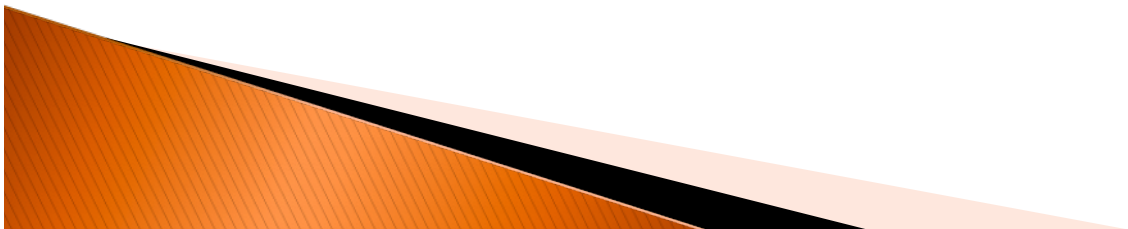


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SUMMARY

1. Simple Equation Are Not Enough.
2. FTE's Can Be A Useful Common Currency.
3. Complexity Factors Are Required - The Devil is in the Details.
4. Historical Data, On Its Own, Only Tells You What Happened in the Past.
5. Discrete Event Modeling Software - The Crystal Ball - Turn Data into Future Trends.



“That which we persist in doing becomes easier - not that the nature of the task has changed but our ability to do has increased.”

Ralph Waldo Emerson



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Thank You

Any Questions?



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**“If you have always done it
that way, it is probably
wrong.”**

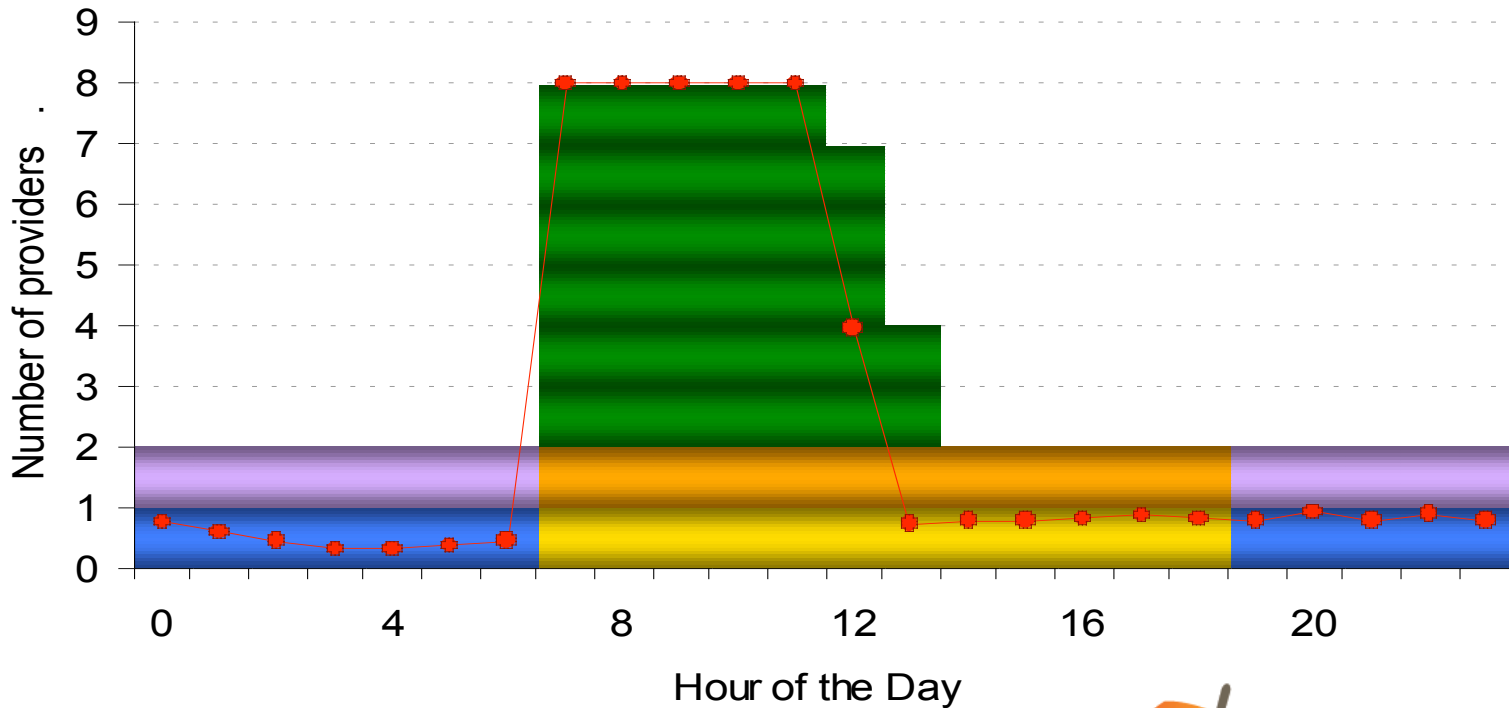
Charles Kettering



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Scheduling Option #1



This is not the stock market

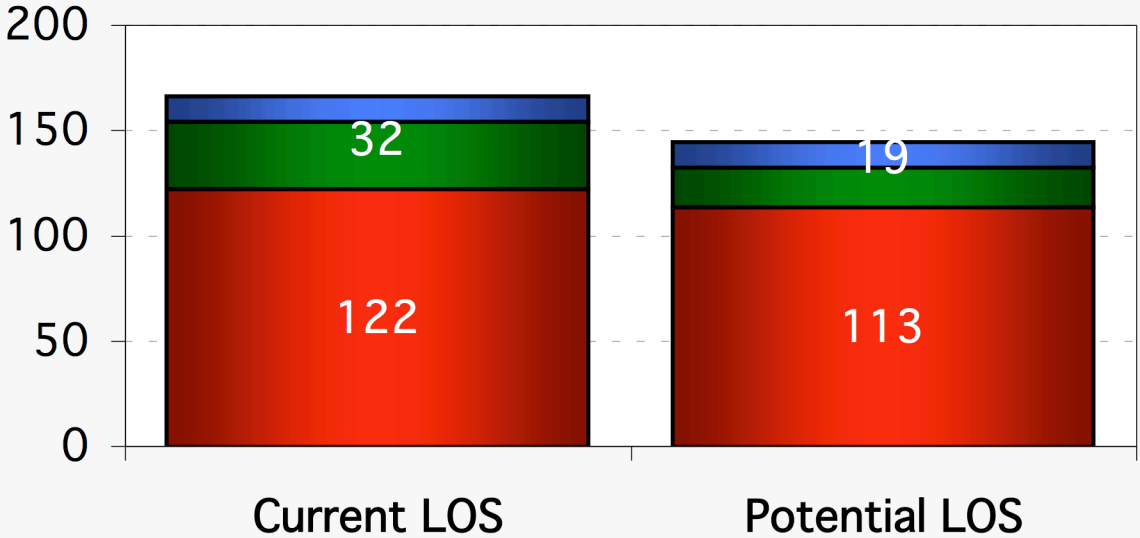
- ▶ Past earnings do not predict future gains



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Average daily census

■ Acute census ■ ALC census ■ Co-managed



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