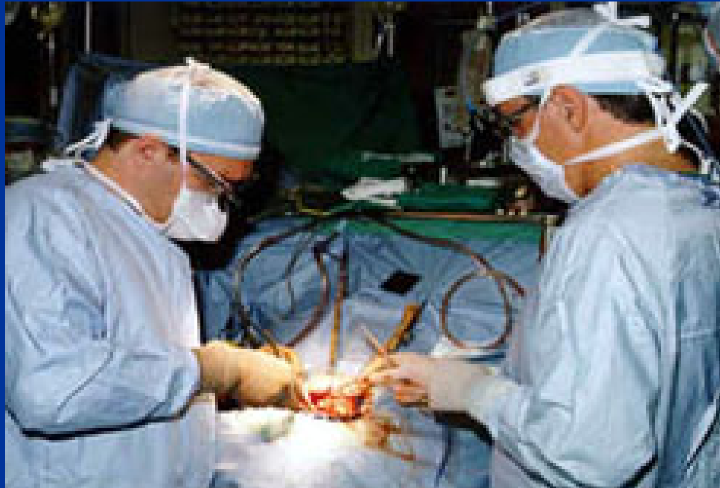
Residency Time-Study – A Training Micro-system Analysis



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Objectives

- To perform a time-study and system analysis of the medical, surgical and ob-gyn residency programs in a 471 bed US academic health center
- To evaluate the results for re-design opportunities in the context of a clinical micro-system
- Tactics:

  Utilize the services of 2 industrial engineering student interns who have no previous healthcare experience

Study Design

- Observations of 8 surgical residents
- Observations of 5 medical residents
- Observations of 5 ob-gyn residents
- Interns (PG 1) Vs Senior Residents (PG 3)
- In the case of medical and surgical residents, observed beginning of year (July first week) Vs end of year (June last week)

Methodology of the Time-Study

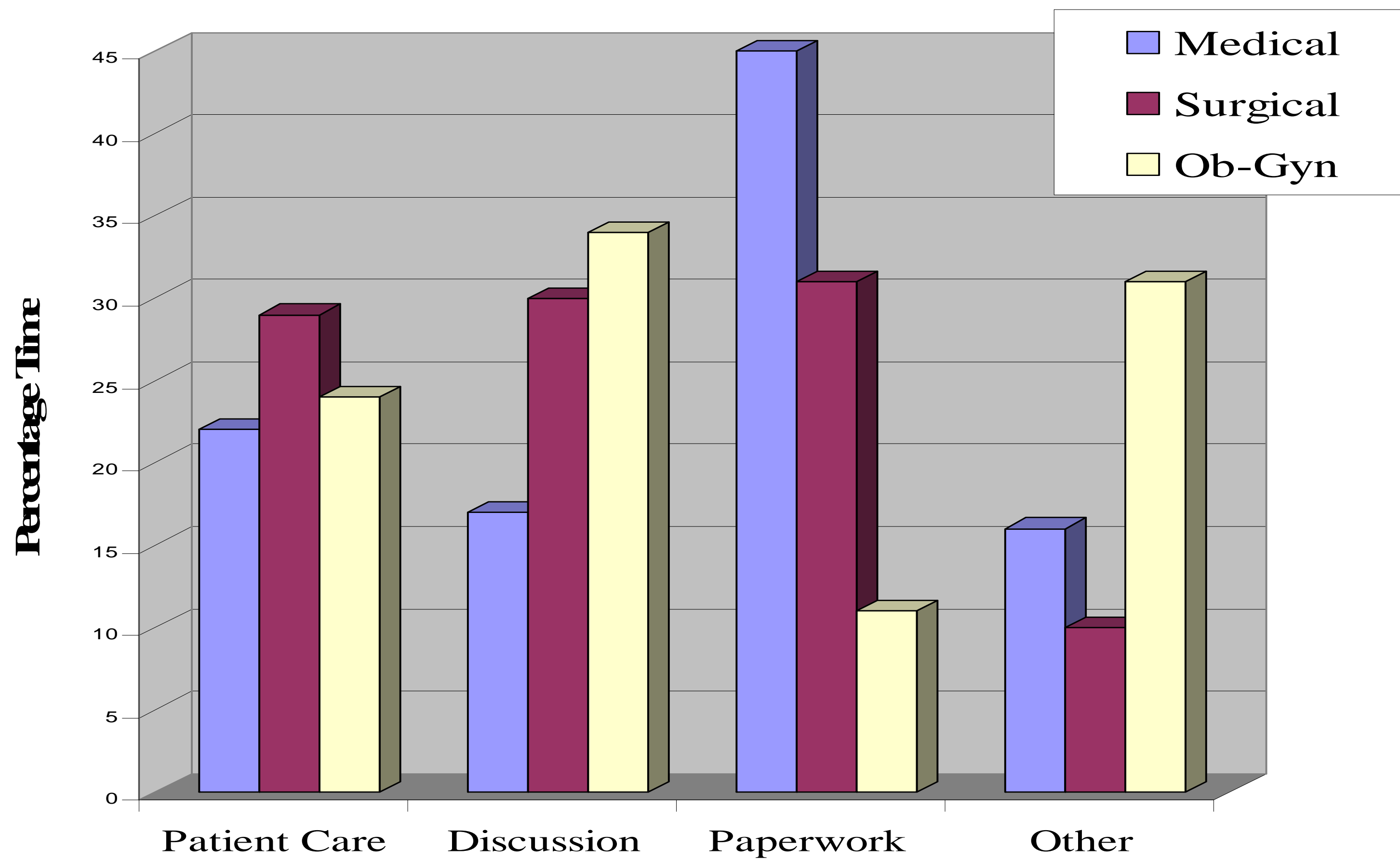
- Recorded all tasks performed
  - Time allotted to each of them
- Delegated major task categories
  - Greatest potential to be educational
  - Together encompass most of the resident's time
- Calculated daily, weekly, and percentage of weekly time for each task

Cardiac Surgery Service: 2nd Year Resident

Time	Monday June 7, 2004
5:45	check excel chart
6:00	looking at x-rays, writing in patients' charts
6:10	consulting with fellow
6:16	writing in chart
6:20	check on patient
	disagreement with nurse
6:25	writing in patient's chart
6:30	consulting with fellow
6:31	see patient
6:40	teaching rounds with attending, two fellows, and two residents. Attending asks challenging questins of residents and fellows
7:10	checking on patient. Nurse upset because patient is in pain and resident has not considered his pain.
7:20	resident writes order for pain meds
7:30	paging attending, waiting for him to return call

Tasks	Total Daily Time
direct patient care	3 hrs. 10 min
OR	1 hr. 6 min
attending interaction	1 hr.
pharmacist interaction	0 min
interaction with fellow or chief	38 min
other resident interaction	15 min
PA interaction	40 min
interaction with nurses	5 min
Paperwork/labs	3 hr. 24 min

Results



Results
Weekly Hours -Medical

Service	Hours	Days	Year
GMED	92.25	8	PG 1 End
GMED	88.15	7	PG 1Start
Pulmonary	75.05	7	PG 1Start
Hospitalists	84	8	PG 3 End
G.I.	102	7	PG 3 End

Results-Surgical

- Results of Time-Study for End of Year Resident on Cardiac
- Difficult to determine what is educational
- Does not display how many interactions
  - Some interactions are short but frequent

Task	
	Weekly Time
Direct Patient care	10 hrs. 53 min
Operating Room	6 hrs. 53 min
Attending interaction	2 hrs. 17 min
Pharmacist interaction	12 min
Interaction with fellow or chief	5 hrs. 4 min
Other resident interaction	45 min
PA interaction	2 hrs. 26 min
nurse interaction	1 hr. 16 min

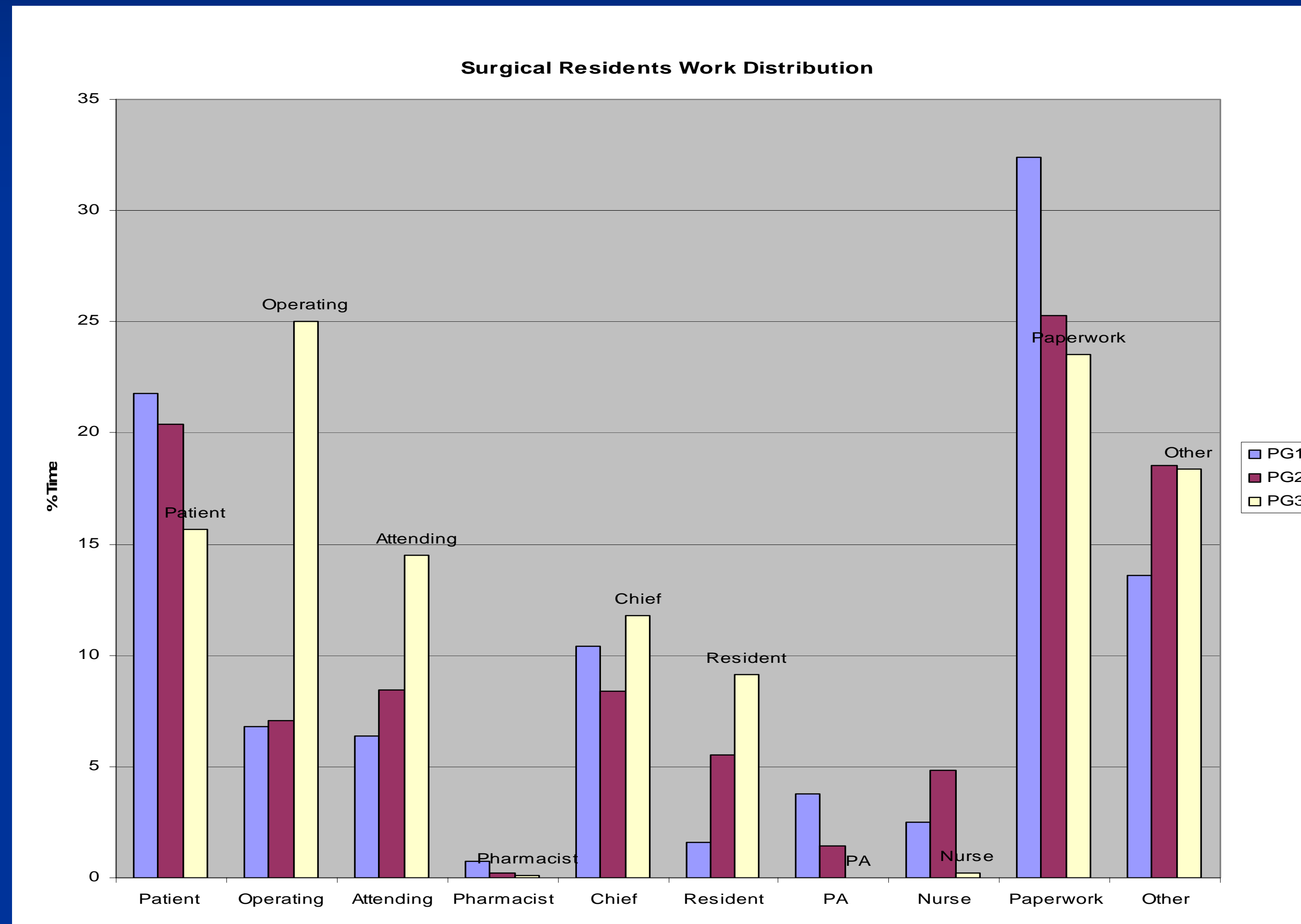
Results
Surgical –Beginning Year

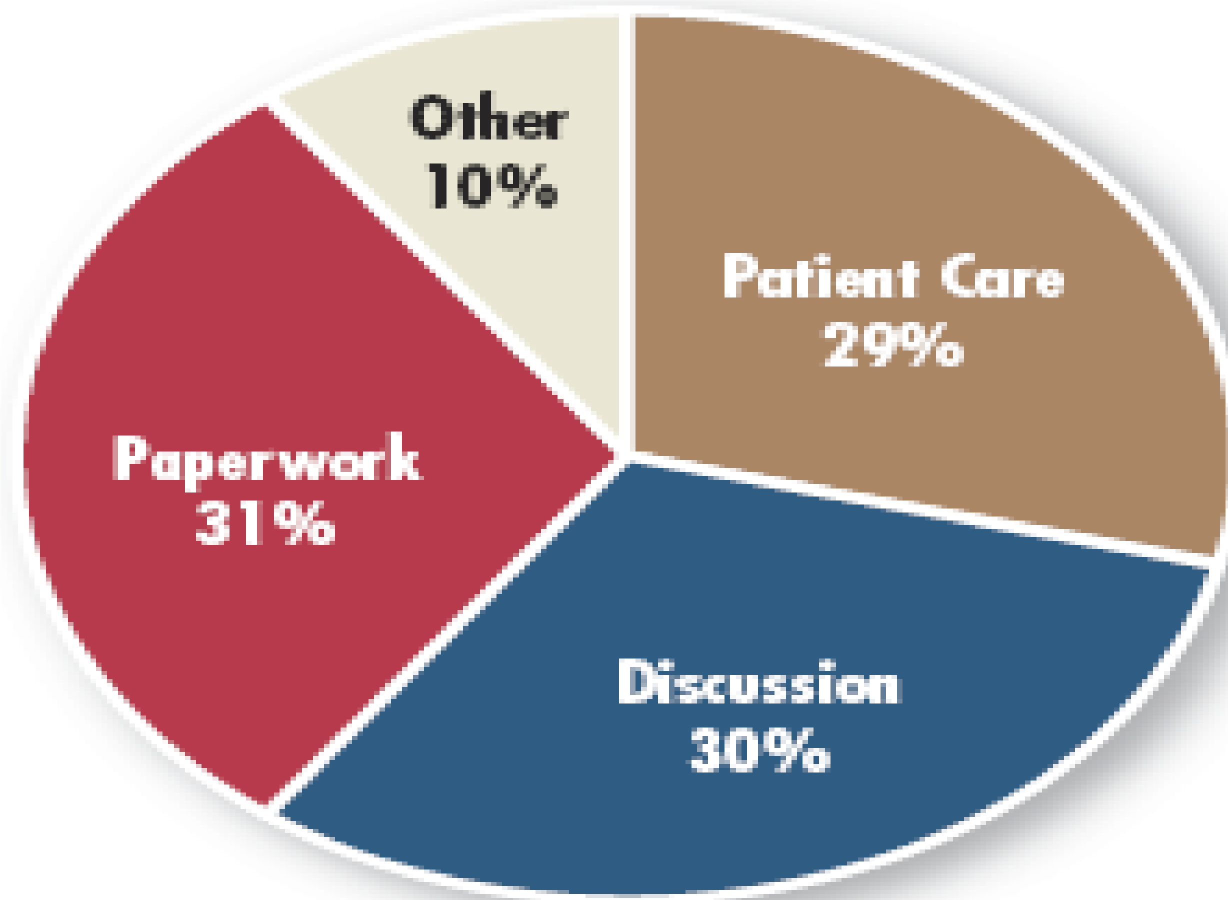
Beginning of Resident Year			
	Service	Hours	Days
Total Worked	PG1 Vasc	95.37	7
Total Worked	PG1 Blue	22.73	2
Total Worked	PG2 Card	82.47	7
Total Worked	PG3 Blue	38.05	3

Results
Surgical – End Year

End of Resident Year			
	Service	Hours	Days
Total Worked	PG1 Vasc	65.6	6
Total Worked	PG1 Blue	22.67	2
Total Worked	PG2 Card	61.25	6
Total Worked	PG3 Blue	35.33	3

Results
Surgical Work Distribution



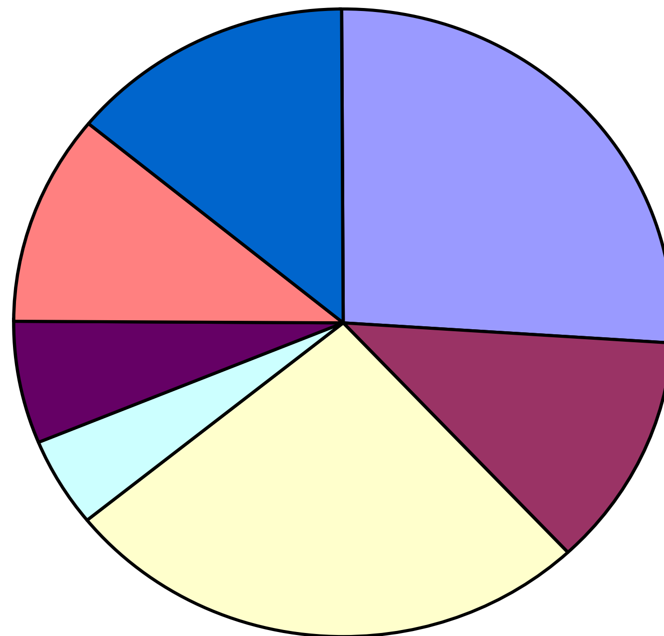

RESULTS OF
SURGICAL RESIDENT TIME STUDY
Other
10%
Patient Care
29%
Paperwork
31%
Discussion
30%

Preliminary Results
Ob-Gyn

			Year			
Categories:	Night Fl Intern	Night Fl Pgy 4	Day Fl Intern 1	Day Fl Intern 2	Day Fl pgy 2	Average
patient care	19%	15%	26%	20%	39%	24%
paperwork	14%	8%	10%	12%	12%	11%
discussion	16%	22%	22%	37%	22%	24%
attending	2%	6%	4%	3%	3%	4%
didactic learning	7%	5%	10%	2%	6%	6%
productive down time	0%	19%	14%	13%	2%	10%
unproductive down time	34%	19%	3%	4%	5%	13%
total time	93%	94%	89%	91%	89%	91%

Preliminary Results
Ob-Gyn

Ob-Gyn Resident Time



- patient care
- paperwork
- discussion
- attending
- didactic learning
- productive down time
- unproductive down time

Conclusions based on Interviews and Observations

Four main categories for Medical and Surgical Residencies identified:

- Communication
- Systems of Care:
  - Lack of Role Definition and Expectations
  - Delivery of direct patient care
- Service vs. Education
- Workload/Paperwork

Communication

- Attending interaction
  - Ordering resident to complete task
  - Without explanation
- Residents:
  - Feel uncomfortable questioning attendings and fellows
  - Afraid to contact attendings
- Attendings often difficult to get a hold of
- Skips resident on services with midlevel providers

Systems of Care:
Lack of Role Definition and Expectations

- Power struggle: residents and midlevel providers
  - Overlap duties
- Job expectations are unclear

  Are there incentives to educate? A system of accountability?
- What role do:
  - Attendings
  - Pharmacists
  - Fellows/chiefs
  - Other residents
  - Midlevel providers
  - Nurses

  Play in the education of residents?

Systems of Care: Delivery of Direct Patient Care

- Rotations cause problems with continuous care
- Poor communication between different services/co-workers
- Teaching practices are not congruent
  - Rounding practices
  - Time spent with resident
  - Discussion of patients
- Disincentives are in place for discharging patients
- Discussion of patients outside the room
- Unclear who is responsible for the patient's care

Service vs. Education

- Both are important
  - Inherent in any healthcare training role
- Residents feel the program is more service than education oriented
- Role of service compromises education
- Medical residents struggle to attend any off-unit educational offerings
- I.e. attendance at General Surgery Conference and Professor's Hour
  - Direct educational time
  - Indirect educational time being compromised?
    - Harder to determine
- Residents under-record hours they work
  - Intern worked 95 hrs.

Workload/Paperwork

- Critically review the impact of the on-call position
  - Residents struggle to take care of patients solely
  - Causes problems with scheduling and meeting work hours
- Time involved with transcribing information from one location to another
- Impact on social life

Workload/Paperwork

- Difficult without medical background to determine
  - Complain paperwork is excessive
    - Avg. 25% for surgical residents and 34% for medical residents
    - Much of it is transferring of information
  - The benefits:
    - some inherent educational value
    - Gain patient knowledge by writing
  - Observations do not show VA paperless system took less time
    - Residents are not comfortable with it
    - Allows residents to not think

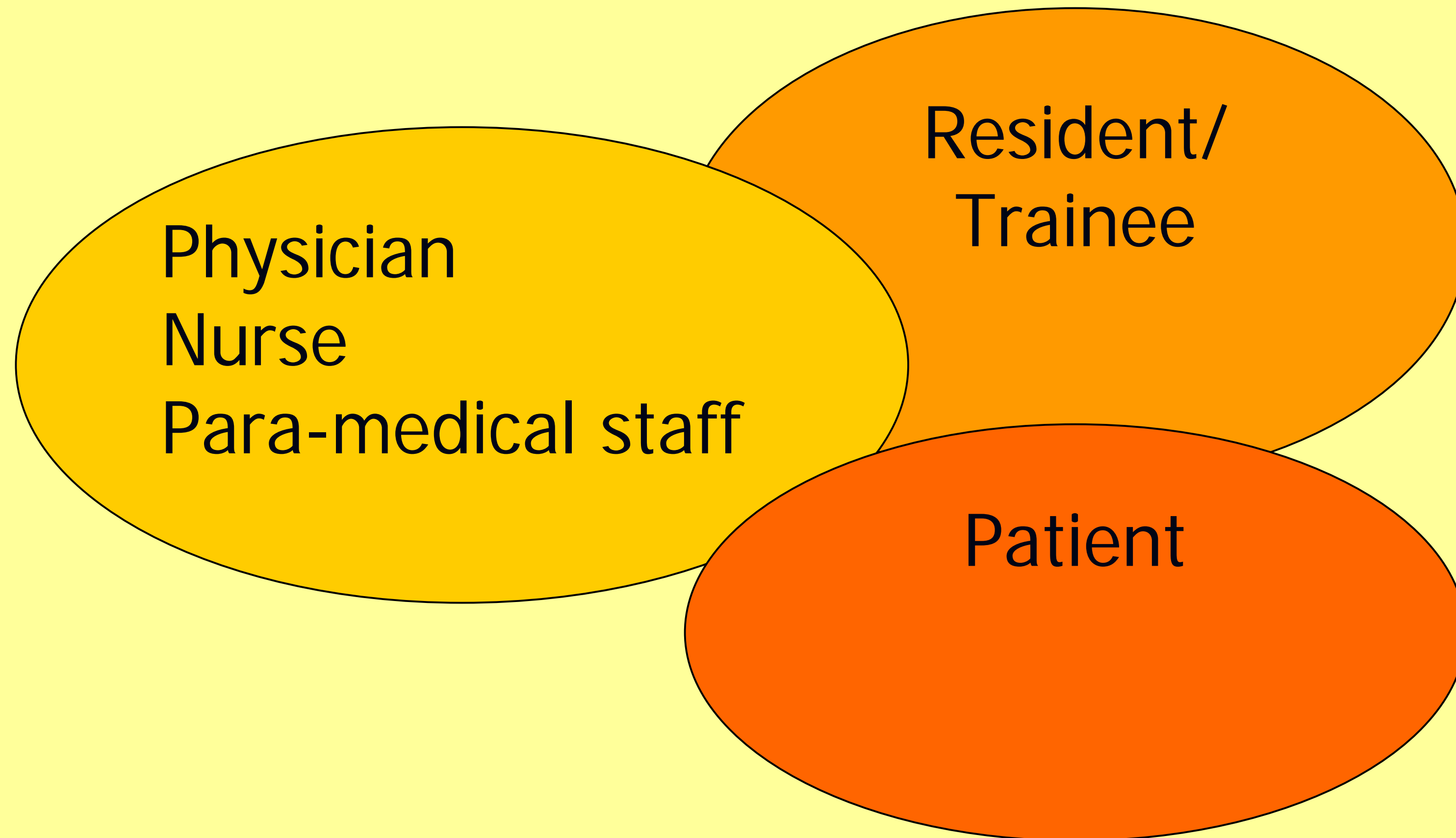
Can we put our findings in the context of a Clinical Micro-system?

- Nelson et al has defined a clinical micro-system us defined as a small group of people who work together on a regular basis to care for discrete populations

Resident Training Micro-system

- A resident training micro-system could be defined as a small group of people who work together to care for patients while concurrently training a temporary member of their own team

Resident Training Micro-system



Attributes of a High Performing Micro-system*

- Leadership
- Culture
- Organizational Support
- Patient Focus
- Staff Focus
- Interdependence of Care Team
- Information and Information Technology
- Process Improvement
- Performance Patterns

* Nelson et al

Potential Solutions Using a Micro-system Approach

We examined whether we could use the construct of a high performing clinical micro-system to frame our findings and suggest possible solutions

Leadership

Areas of Improvement from UWHC Time Study	Potential Solutions
▪Lack of Role Definition and Expectations: Need for more thorough and consistent orientation to responsibilities and emphasis on accountability ▪Some attending physicians have no desire to partake in residency education.	▪ Goal and expectation handouts given to very resident at beginning of rotation. Also describes the role/responsibility of other members of the team including the attending physician ▪360* feedback for attending physicians with quick follow-up

Culture

Areas of Improvement from UWHC Time Study	Potential Solutions
○Communication: On certain services, the residents feel that they are purposefully skipped in the communication path. ○Work Hours: The residents will continue to work as long as it takes to get their work done, regardless of the 80 hour limit.	○Insist on clear lines of communication for unit members ○Work hour reduction is dependant on redesigning the resident education system rather than trying than putting scheduling limits

Organizational Support

Areas of Improvement from UWHC Time Study	Potential Solutions
○Need to address scheduling conflicts that result in residents missing educational activities (morning rounds, etc) – service Vs education ○Difficulty associated with moving to a new city and the rigors of internship	○Consider redesign of residency model to one of an apprenticeship – resident is learner and attending as a mentor and primary provider of healthcare for the patient ○Core service rotations ○Re-scheduling morning report/rounds OR Attending responsible for admitting patients in that period ○Relocation information 'package' for all incoming residents

Patient Focus

Areas of Improvement from UWHC Time Study	Potential Solutions
◦Evidence found (and residents believe) that excessive paperwork detracts from patient care and resident education	◦System redesign to incorporate IT solutions and training to remove redundancy and have appropriate checks and balances in place

Staff Focus

Areas of Improvement from UWHC Time Study	Potential Solutions
○Inherent structure of the present training model does not allow for residents to become part of a unit for extended periods of time	○Core rotation model which assigns residents to core services for extended periods of time (>2 months)

Interdependance of Care Team

Areas of Improvement from UWHC Time Study	Potential Solutions
○The nurses and physicians would only talk to each other when it was absolutely necessary.	○Clear lines of communication need to be established and documented. ○Each unit should have a flow chart documenting the role of each staff member – should be placed in each patient room

Information and Information Technology

Areas of Improvement from UWHC Time Study	Potential Solutions
○Explore streamlining and/or automation to reduce transferring of information	○CPOE training and implementation ○PDA that can link to EMR, labs so that and can be updated in real time – so patient not walking around with excel sheet

Process Improvement

Areas of Improvement from UWHC Time Study	Potential Solutions
o Present work flow is far from optimal o Little change in the resident education model in the last few decades o Eg. Completing a task from beginning to end to nearly always interrupted by a page from a nurse	o Resident education model redesign – present system is inefficient, not patient centric and untimely. o Empower members of the micro-system to drive the change – all of them individually have numerous suggestions to improve the process.

Performance Patterns

Areas of Improvement from UWHC Time Study	Potential Solutions
○No qualitative/quantitative data to assess performance	○360* evaluation on a team by team basis (vertical rather than horizontal) ○Clinical and educational outcomes need to be quantified

Study Biases

- Presence of an observer
  - one obvious display of observation bias
- Anecdotal bias
  - Representative Sample?

Discussion

- Is the structure of the resident training micro-system generalizable across systems?
- A micro-system approach to redesign allows us to move away from work hour restrictions

Next Steps

Thank you