

Understanding Physician Team Relationships & Sensemaking Using Agent Based Modeling

Luci K. Leykum

Work with Pradeep Kumar, Michael Parchman,
Reuben R. McDaniel, Jr., Holly Lanham,
& Michael Agar



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What is it that we are seeing here?

Complex Adaptive Systems

- Uncertainty and surprise are inherent

Clinical



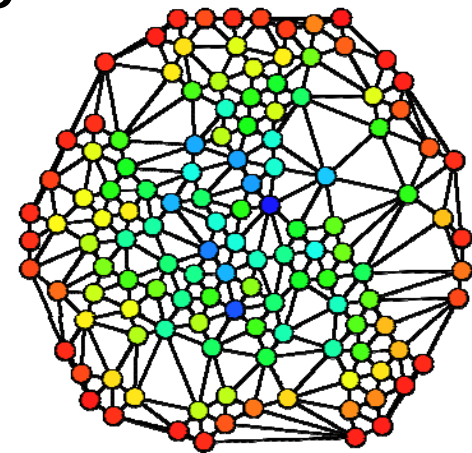
Scientific

System

- Strategies to improve our ability to navigate uncertainty are more likely to lead to improved outcomes

Focus on Relationships

- What are the patterns of relationships we see in clinical microsystems?
 - Can we distinguish them?
- What is the association between these patterns and patient outcomes?

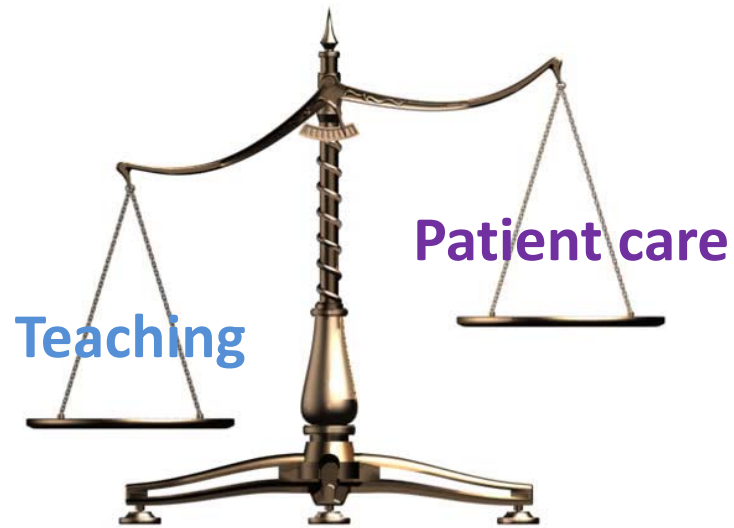


What we did

- We looked for differences between physician teams based on how they related to each other
- Looked at outcomes of patients admitted to those teams



What we saw



Why use agent-based modeling to study these behaviors?

- Assess impacts from a small sample on a larger scale
- Explore the extremes
- Building the model helps us to be clear on the relationships between the components

ABM construction



- Physician team is single entity interacting with patients
- 2 things can influence patient outcomes:
 - Physician team characteristics (varied by us)
 - Patient characteristics - acuity and number
 - (based on literature and random functions)

Physician team attributes

- Following parameters can be varied:
 - Attending “attitude” or identity
 - Sensemaking
 - Improvising

Patient attributes

- Patients “admitted” in accordance with actual team call schedule

- Max

- Pati

CRISIS

- All patients have a chance of dying (3%)

Physician team attributes & outcomes

Parameter	Potential values	Impact on outcomes
Attending attitude / identity	Education	Patients improve more slowly Increased mortality
	Patient care	No change in patient improvement or mortality
	Both	Patients improve more quickly Decreased mortality
Sensemaking	0-3	Patients improve more slowly Increased mortality
	4-5	No change in patient improvement or mortality
	6-7	Patients improve more quickly Decreased mortality
Improvisation	low	No change in patient improvement or mortality
	high	Patients improve more quickly Decreased mortality

Model Setup

Select-Team
Education ▼

Sensemaking 5

On
 Off Improvisation

Setup

Advance One Day

Run 30 Days 

Discharges
0

ICU Transfers
0

Deceased Patients
0

Crisis Count
0

Average Acuity
N/A

Current Census
0

Number of Infections
0

Select-Team
Patient Care

Sensemaking 7

On Off Improvisation

Setup

Advance One Day

Run 30 Days

Discharges: 3

ICU Transfers: 0

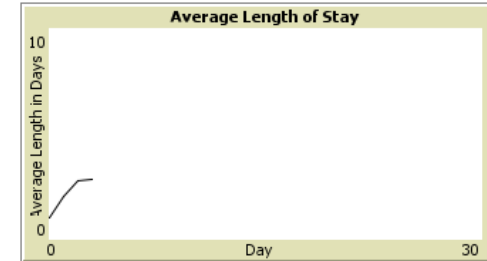
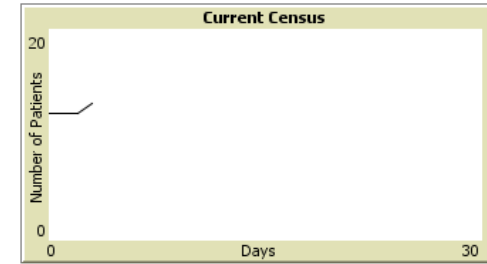
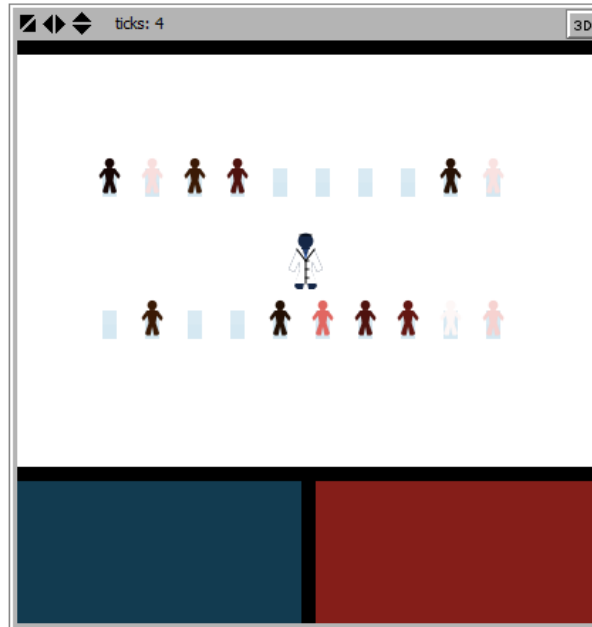
Deceased Patients: 0

Crisis Count: 0

Average Acuity: 0.1055

Current Census: 13

Number of Infections: 1



Select-Team
Patient Care

Sensemaking 7

On Off Improvisation

Setup

Advance One Day

Run 30 Days

Discharges: 72

ICU Transfers: 1

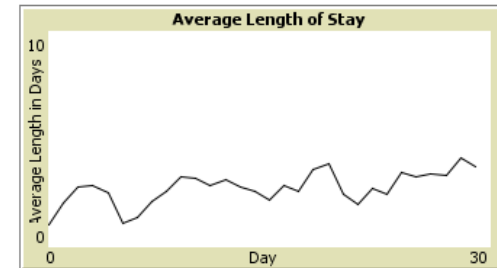
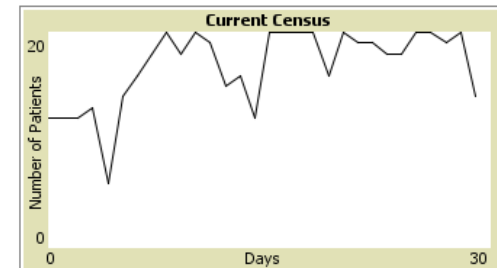
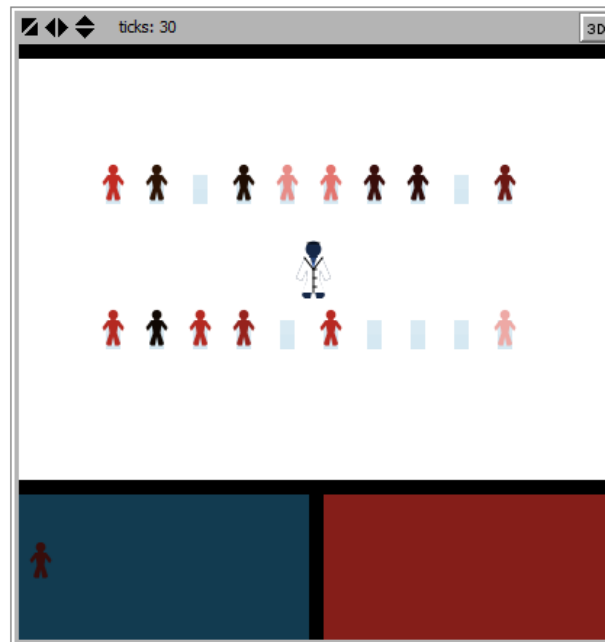
Deceased Patients: 0

Crisis Count: 0

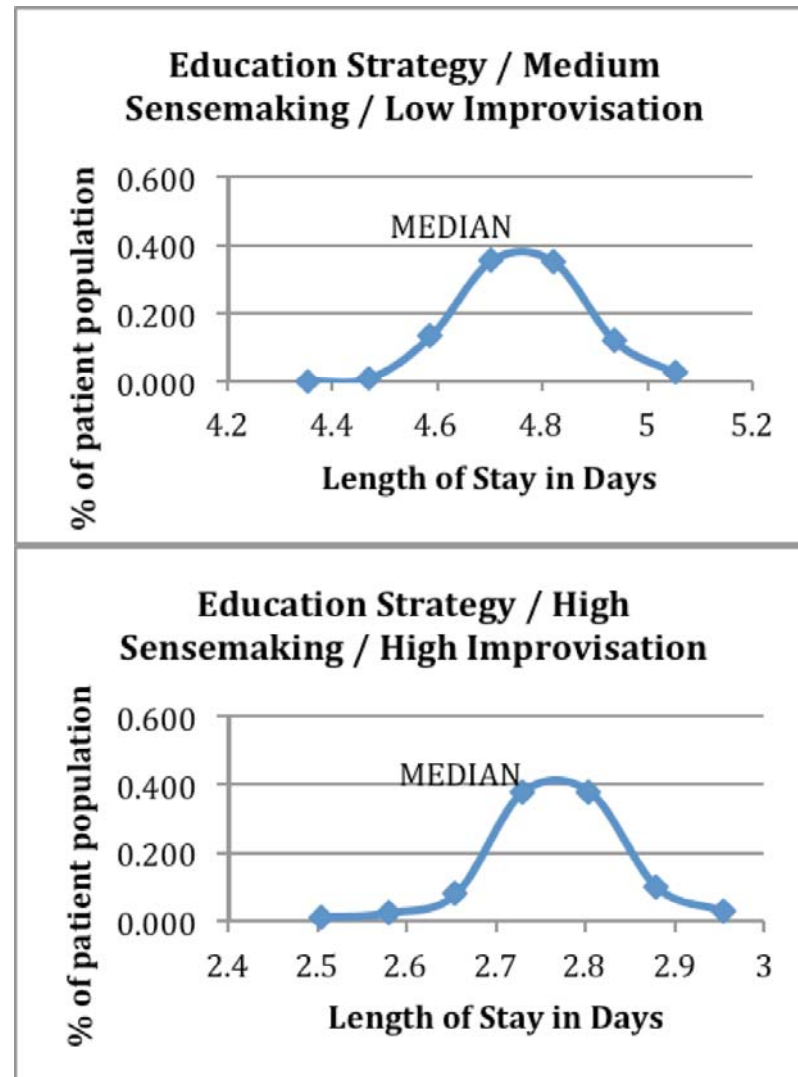
Average Acuity: 0.2784

Current Census: 14

Number of Infections: 18



Length of stay:



Total discharges:

	Education	Patient Care	Mixed
No improvisation Low sensemaking	16.1 (1.6)	27.0 (2.1)	34.8 (2.1)
No improvisation Moderate sensemaking	37.7 (2.7)	46.6 (3.0)	53.4 (3.8)
Improvisation High sensemaking	64.3 (4.2)	66.7 (4.0)	66.9 (5.0)

Potential implications

- How providers relate may in fact influence patient outcomes
 - Sensemaking and improvising
- Interventions to improve them may be effective in improving patient outcomes
 - Use model to help think through potential interventions / effects

SOAP – IQ Care Plans: To get more out of bedside discussions,
increase your I.Q. by asking these questions:

**Subjective,
Objective:**
Patient, family
& team updates.

- What has happened from the patient's perspective?
- What is the family's input?
- What do the other providers have to say?



**Assessment &
Plan:**
Make your
A&P explicit!

- What do we think is going on?
- What are the most important problems for this patient today?
- What specific tasks do we need to do next?

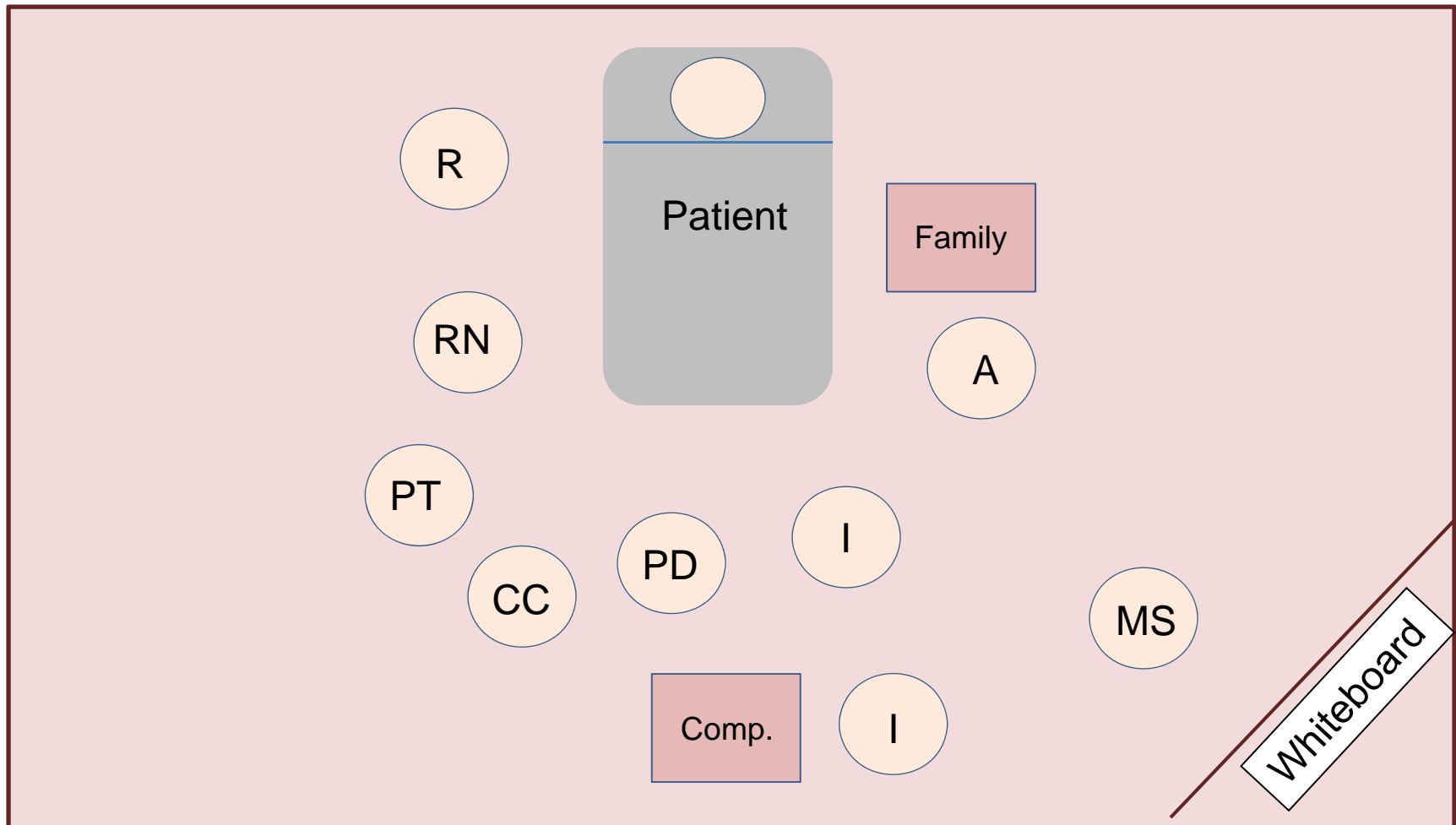
Intent:
Does everyone
understand the
plan?

- Why did we come up with this plan?
- Why are we following "Plan A" instead of "Plan B"?
- How will you explain this to the patient?

Questions:
Ask these to
improve quality:

- What other problems should we consider?
- What could go wrong?
- What should we watch for?
- Contingency planning - What do we do if...?

Collaborative Care



The most important things I learned from Mike

- Front end work
- The importance of thinking
- Trust yourself

