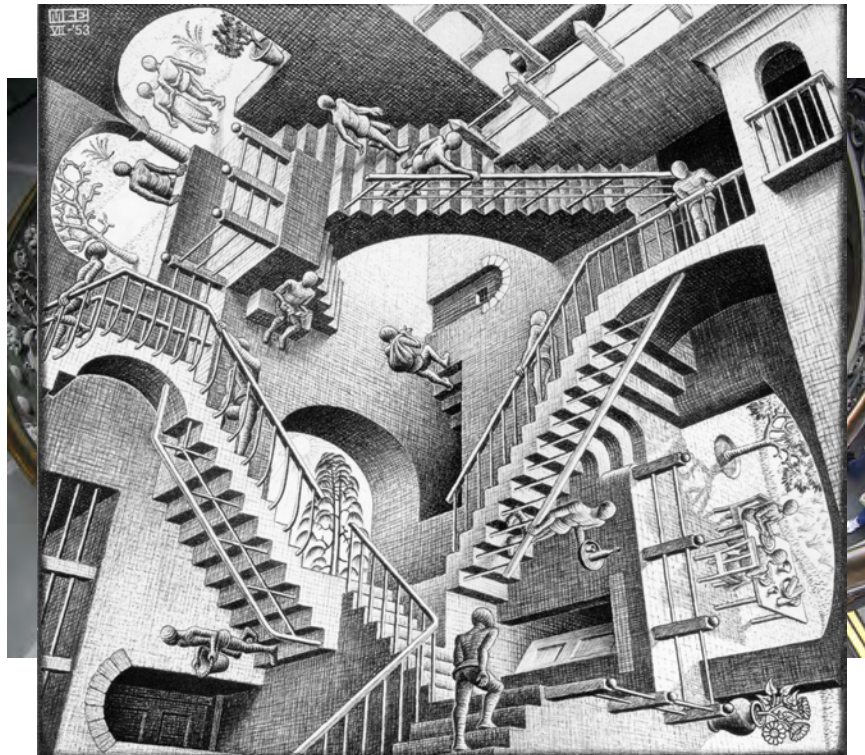


# Case based learning in the curriculum

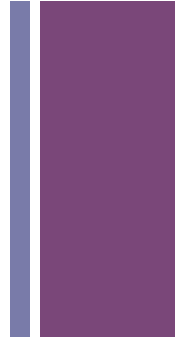
Lindsay Davidson and Sheila Pinchin  
Health Science Education Rounds  
November 2013

# + Queen's UGME program:

Our curricular goal is progressive case complexity throughout the curriculum.



# + Problem:



How can we categorize the complexity of teaching cases?



## + Problem:

How can we measure both the cases themselves as well as their placement in our teaching sequence?



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How can we measure both the cases themselves as well as their placement in our teaching sequence?



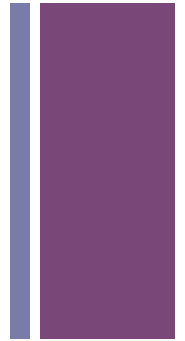


# Our Starting Point: (c.2009) Case Based Learning MATRIX



Level of complexity	# of likely diagnoses for presentation	# of systems involved	Level of difficulty of concepts and conditions	Pathway to diagnosis	Number and impact of complications	Number and impact of psychosocial factors	Number of learning objectives	Level of certainty in decision making	Experiential learning
<b>Simple</b>	1-2	1	Low—Required knowledge from background reading provided	Simple—one path of flowchart	0-1	1 max.	1	Un-ambiguous	Not necessary
<b>Moderately complex</b>	One of the potential diagnoses may be life threatening and require immediate action	2-3	Required knowledge must be synthesized from several lessons within course	2-3 branches of schema	Can be consideration of change to gender, age of patient or change of role of physician	2-3	2-3	Some uncertainty must be accommodated	through observer-ships, First Patient Program, Clinical Skills
<b>Complex</b>	Many	<3	High—Required knowledge must be uncovered and synthesized from several courses, and practical experiences	Complex—many possible branches	Several—Risks associated with conditions  Addition of dynamic conditions	Several	Several	High uncertainty re: diagnosis, and management	Required or preferred

# + Methods

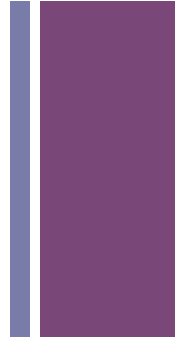


- Utilization-focused evaluation (Patton, 2008) “done for and with specific intended primary users for specific, intended users”
- Grounded theory (Cresswell, 2013), qualitative approach
- Developing a theory grounded in data from the field—grounded in views of participants “seeking to understand the understanding”
- Studying a *process*, action or interaction involving many individuals
- Generating a theory, *model*, figure, etc.



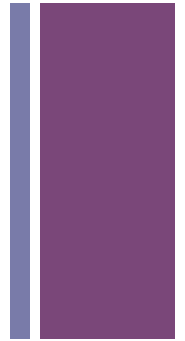
## + Data collection

- Literature review
- Document review (Years 1-2 MD curriculum) identifying case-based teaching (non-FSGL)
- Interviews with experienced faculty who use cases in their teaching

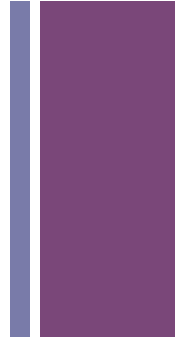


# + Data Collection: Lit Review

- Extremely challenging
- Many articles in business, law, education discuss case complexity
- Few discuss ways of analyzing for complexity: “design, use and evaluation of teaching cases”
- Acknowledge importance of complexity but stop at “more difficult” or only at creating criteria that could be used
- Found literature in hospital insurance cases (assessment of risk of extended hospital stay), and 2 core articles: Kim et al and Hennen



## + Data collection - Interviews 1



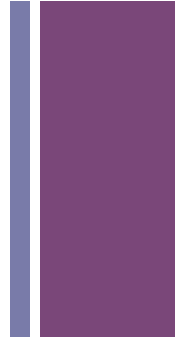
- In depth 1 hour semi-structured interview exploring the faculty member's use of cases in teaching and seeking feedback on draft case analysis matrix

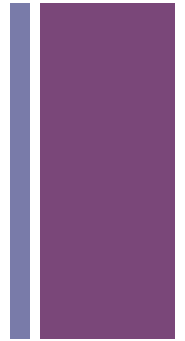
# +Revision of matrix

Level of complexity of cases and tasks	Incidence/prevalence of condition	# of systems involved	Link to students' prior knowledge	Entry points into diagnosis and management solution path length (Hays & Simon, 1974)	Solutions and therapies	Co-morbidities and systematic problems (including psych)	Focus on medical expert objectives	<i>Intrinsic roles</i> involved, psychosocial (Stiefel et al 2006)
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## + Data collection: Interview 2

- Open ended interviews with faculty seeking input on revised case rubric





Revision to *rubric*

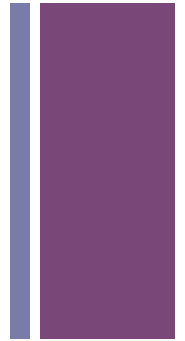
## + Results

### Document Review (MEdTech)

<b>Term</b>	<b># cases (excluding FSGL)</b>
1	31
2	53
3	59
4	40
<b>TOTAL</b>	<b>183</b>

There may be more cases lurking.....

# + Analysis



- Standard qualitative approaches was used to analyze the data (McMillan & Schumacher, 2009). Coded transcripts to allow topics, categories and patterns to emerge from the data.

- **Patterns:**

- A. Case Components/Development**

- B. Challenges with Case-Based Teaching**

- C. Importance of Case Classification Rubric**



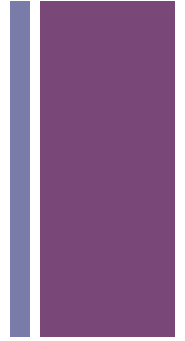
## + Case Components/Development

### ■ Cases work best when they are:

- Authentic, “real-world”, tied to teacher’s own experiences
- Deliberately scaffolded for learning



## + Case Components/Development



### ■ **When developing cases:**

- It's useful to have Educational Developer (knows full curriculum)
- Consider technology to make relevant, “real world”
- Collaborate with others especially if a case is more complex
- Consider a range of assessment strategies



Nadia

School of Medicine

The Accident

ER - Middleville Middleville Chart

ER - Middleville

Jane Doe

Middleville Chart

Nursing notes

Physician notes

Imaging

ER - Bigtown

Bigtown Chart

Nadia

Life in General

School

Job

Claire

Links

Gender and Trauma

ITIM: Published Trauma Guideline

Galleries

Media Credits

Credits

Community Login

Log in using your MEDTech Central account to access more community features.

[Click here to login](#)

Middleville  
Jane Doe  
July 9, 2010

HR	RR	TEMP	PULSE	RESP	BLOOD PRESSURE	SAT SATS	WT (kg)
84	21	36.4	110	25	80/50	93%	65

Young female - 20 yo, belted driver, head on collision @ highway speed - driver of other car dead @ scene. arrived in full spinal precautions  
 - Airway - patent. Pt. arousing  
 - Breathing - ↓ A/E @ R. Trauma deviated to @ → @ chest tube inserted. → impaired cuts, still hypotensive  
 - Circulation - hypotensive & tachycardic  
 - 14g IV inserted → normal saline bolus  
 - transient response - second bolus, sent to @ - bleed  
 - No Foley inserted.

Basal secondary survey - multiple abrasions face  
 - A/E @ A/E, chest tube fluctuating, no leak  
 - abd soft  
 - multiple extra rib - @ femur  
 - @ humerus, forearm  
 - ? @ hip or femur  
 - Splinted for transport  
 - → Emergent transfer to trauma team @ Bigtown

Multiple Trauma

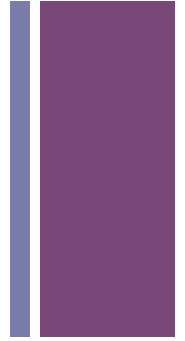
EMERGENCY SERVICES

DATE: 7/9/10 TIME: 08:10

ATTENDING PHYSICIAN: [Signature]

Middleville Chart - Jane Doe

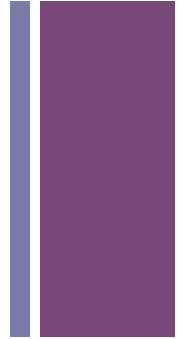
## + Case Components/Development



### ■ **To build complexity:**

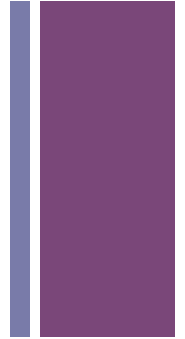
- You can transform a simple case into a more complex one through different techniques
- Complexity can mean several different concepts, structures or teaching methods (approach to case)

# + Challenges with Case-Based teaching



- Understanding the student's educational landscape
  - Where have students come from? What do they know? What can they do?
  - What is happening in related courses?
  - Where are students going? What will they need to know? What will they need to be able to do?

# + Challenges with Case-Based teaching



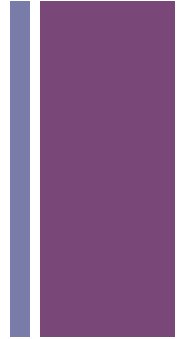
- You can't do everything in every case
  - Time pressures
  - Desire for complete coverage of every topic
  - Shift to conceptual learning, giving students the tools to approach unknown cases, situations

# + Importance of Case Classification Rubric

- Eliminates “trial and error” strategy for developing and using cases
- Identifies cases that might be misplaced in the program



# + 2 ideas that we had about complexity:



- Informational complexity

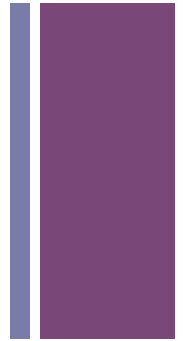
- Relates to detail, richness of information presented to learners

- Functional complexity

- Increased requirement for learners to interpret, analyze, evaluate the case
- Higher level on Bloom's taxonomy of cognitive skills



# + Activity: Field test revised Case Rubric

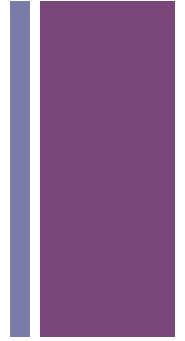


- Name
- Case
- Cohort you teach
- One line case summary
- Feedback: What does this rubric capture well?
- What is missing? What is unclear?
- Problems?

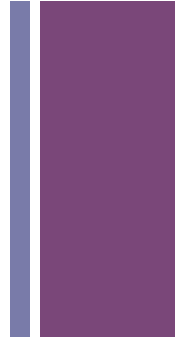


## + Next steps for us:

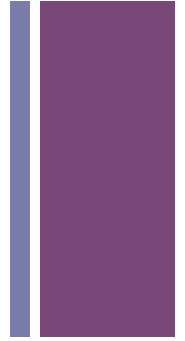
- Assign cases “complexity score” based on rubric
- Use this to optimize the developmental progression expected from students in our curriculum



## + Possibly...



- Digital case repository accessible to faculty (in all 3 Schools)
- Searchable with standardized descriptions, tags, keywords, meta-groupings of related cases



# Questions