Centre for Academic Primary Care

University of BRISTOL

Inside the 'black box'

interactive practice in clinical reasoning for 2nd year students

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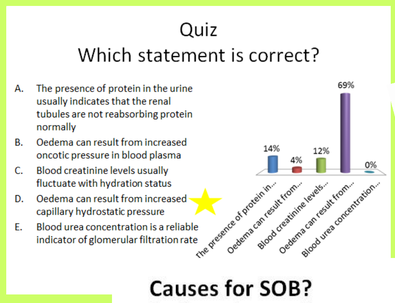
Introduction

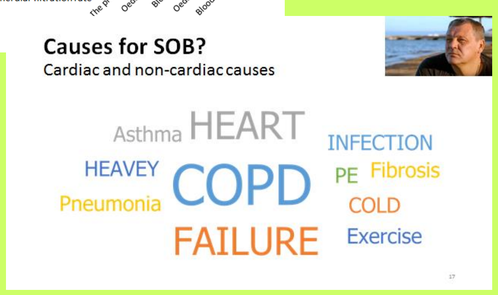
Picking out salient points from patients' stories, making sense of the information and turning it into a diagnosis is a skill students need to learn. This clinical reasoning process is often not overtly displayed and explained and may seem like a 'black box' to novices. This poster describes interactive integrated large group learning sessions for 2nd year students to learn about and practice this skill.

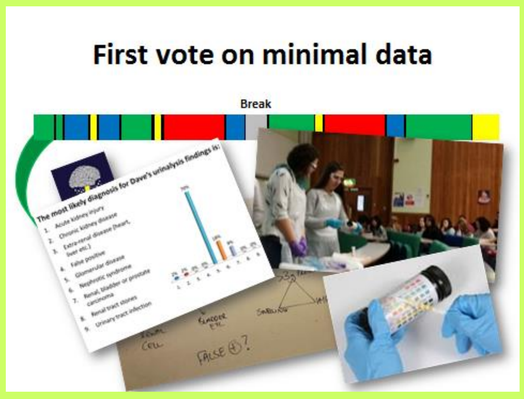
Bristol Medical School has traditionally followed a conventional early years science course with a small amount of body systems based clinical teaching prior to full clinical contact from Year 3. Clinical reasoning was not explicitly taught. To help students integrate science and clinical learning and to practice clinical reasoning we created a series of large group integrated interactive learning sessions. The literature[1] describes two approaches for teaching clinical reasoning, the *serial-cue method* and the *whole case format*. The serial-cue method reveals data gradually, whilst the whole-case format presents students with all the data up front. Our sessions follow the serial-cue method.

The sessions invite students to link their science learning to clinical presentations in primary and secondary care settings. We used a variety of methods to actively engage all students and feel that this takes students to the level of 'analysis' in the cognitive domain of Bloom's taxonomy. In total, together with academic and clinical colleagues, we have created five two-hour sessions linked to the body system the second years were studying – CVS, RS, GI/Liver, Renal and Neuro.

In the lead-up to the launch of the innovative MB21 Bristol undergraduate curriculum we wanted to evaluate these sessions and our explicit teaching of clinical reasoning. This poster showcases these sessions and how they link anatomy, physiology and clinical medicine as a method for explicitly teaching clinical reasoning. We present results that demonstrate students' clinical reasoning and how they evaluate their understanding of the clinical reasoning process as a result of these sessions.



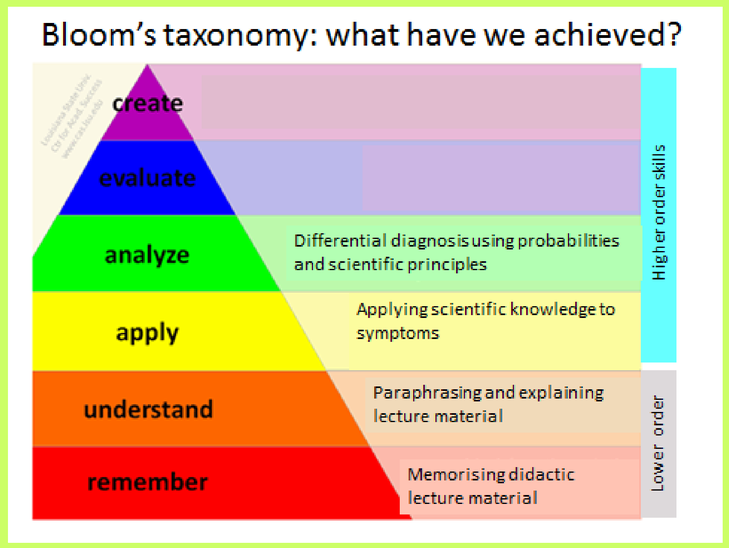




Active learning

Diagnostic questions

What is it?	Diagnosis
What is less likely	Differential diagnosis
What must I not miss?	Red flags
What else could it be?	Beware cognitive errors!
What does the patient think?	Ideas, concerns, expectations



Method - Description of the sessions and data collection

We created five integrated interactive large group learning sessions linked to teaching about body systems - CVS, RS, GI/Liver, Renal and NS.

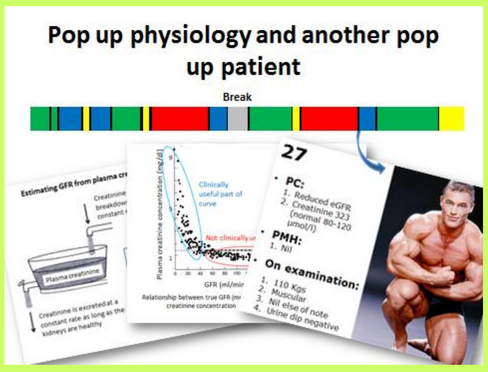
Sessions follow a similar pattern. They have a central patient with a particular presenting symptom, 'pop up patients' with similar symptoms but different diagnoses and 'pop up science' to revise and link relevant physiology and anatomy.

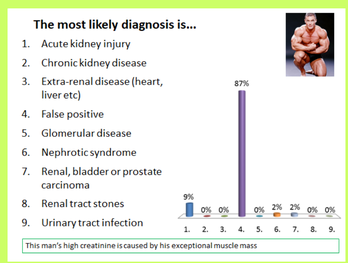
We use the serial cue method and gradually reveal data for our main patient over the course of the session. In doing this we aim to replicate clinical practice, where information is acquired bit by bit, feeding into the building of a diagnosis.

We use a variety of methods to make learning 'active'. An initial quiz is intended to draw students in and activate previous learning. Students then brainstorm diagnoses for the presenting symptom, receive more data at intervals and repeatedly vote on diagnoses. This allows explicit discussion around clinical reasoning and diagnostic thinking as the students acquire an increasingly dense set of data.

To aid this process we give the students a clear '*Five step plan'* describing the diagnostic process. This asks students to apply key findings to 'frameworks' they have already learned about, such as anatomy or physiology, and to practice succinct problem formulations. We encourage them to keep in mind key *'diagnostic questions'.*

The data we have collected are the students' voting patterns which show how students adjust their diagnoses in response to increasingly detailed patient data and different demographics and how they evaluate their understanding of the clinical reasoning process.

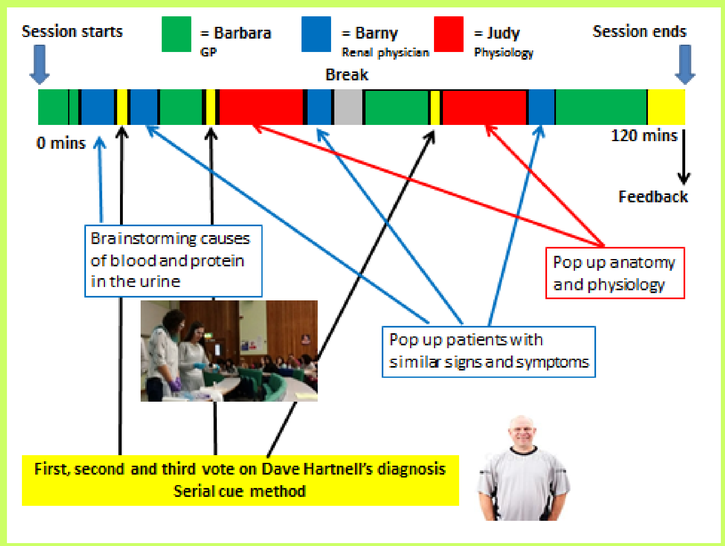


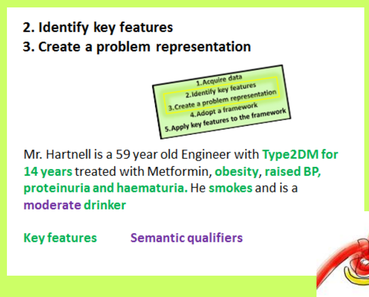


Active learning

Vary the interactions

- **Engage students with a quiz at the start**
- **Brainstorming differential diagnoses for a symptom**
- **Student voting**
- **Student activities - urine dip, oximetry, peak flow, BP**
- **Video clips**
- **Discussion in pairs**
- **Rotate presenters to keep it dynamic**

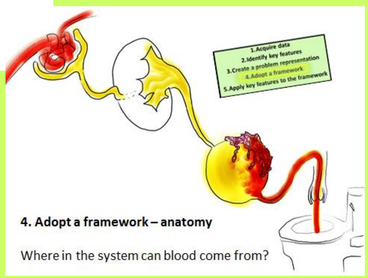


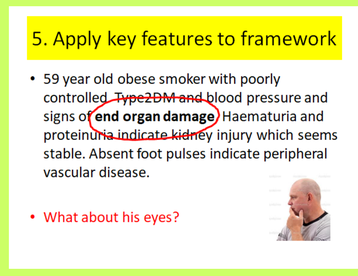


Five step plan – The diagnostic journey

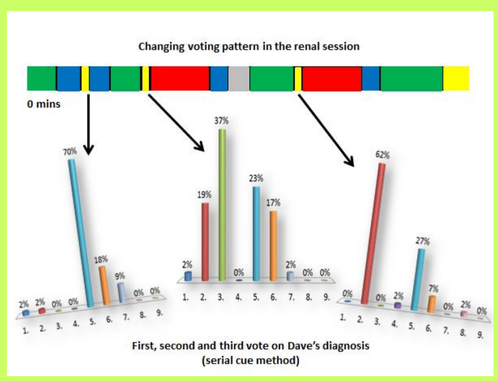
https://www.youtube.com/watch?v=qKrLPY_8Cyk

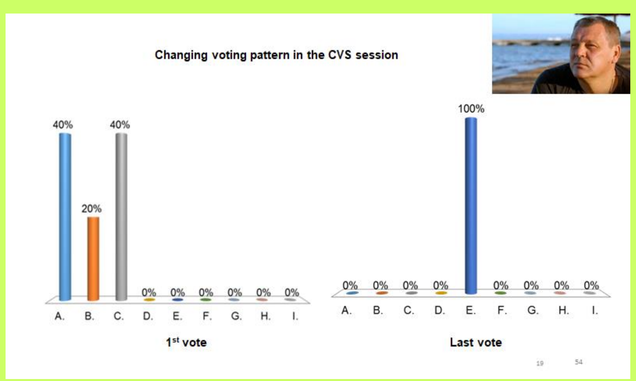
1. **Acquire data**
2. **Identify key features**
3. **Create a problem representations**
4. **Adopt a framework**
5. **Apply key features to the framework**





Changing voting patterns for the Renal and CVS sessions

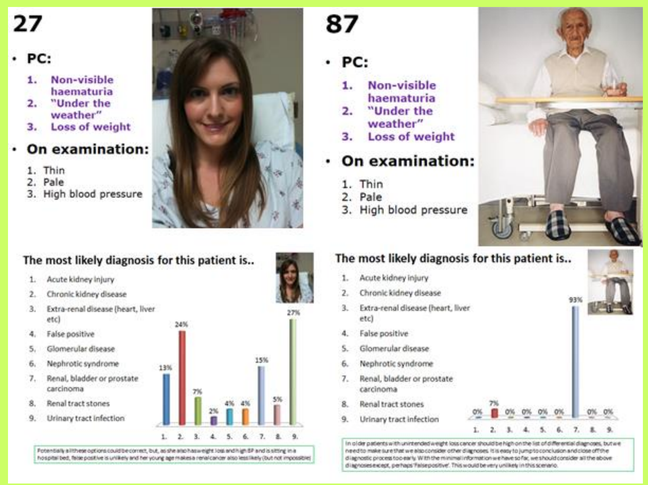




Results

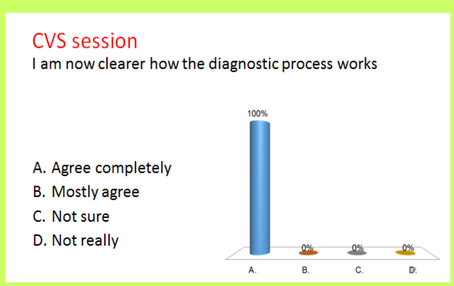
Results from our five integrated lectures in 2017-18 suggest that second year students adjust their diagnosis in response to serially presented information. Students demonstrate probalistic reasoning when they take into account gender, age, ethnicity and context for each patient. We feel that this represents evidence of learning at Kirkpatrick Level 2[2,3]

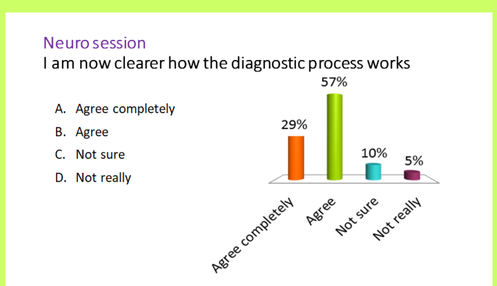
Voting patterns for same symptoms and findings but different gender and age

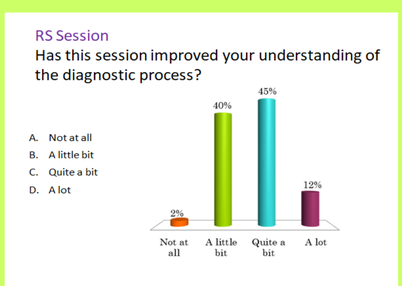


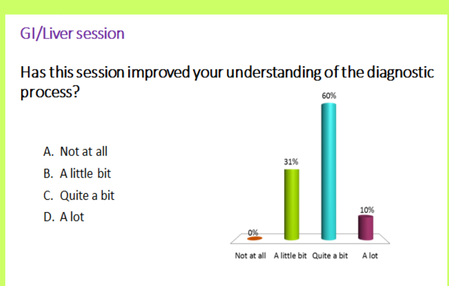
Results

The majority of students felt that they had gained a better understanding of the clinical reasoning process. We are planning to further develop these large group learning sessions for our MB21 curriculum.









References

[1]Schmidt, HG, Silvia Mamede. How to improve the teaching of clinical reasoning: a narrative review and a proposal. Med Educ 2015;49: 961-973

[2]Forest, Ed. Kirkpatrick model: four levels of learning at https://educationaltechnology.net/kirkpatrick-model-four-levels-learning-evaluation/ accessed 10.1.18

[3]Yardley, S, Dornan, T. Kirkpatrick's levels and education 'evidence'. Med Educ 2012;46:97-106

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