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## Case-based learning in a modern medical curriculum



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2013

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### Overview



What is Case/Problem-based learning?

How it works

Where does CBL fit into a modern medical curriculum

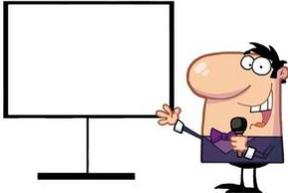
Additional benefits

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Cases have long been used in clinical teaching



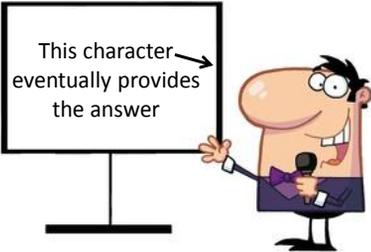
However.....  
Generally used in a didactic setting



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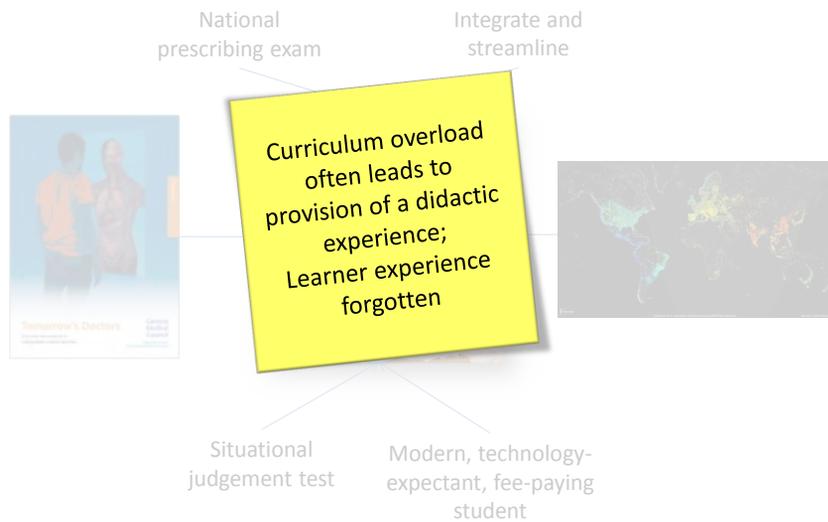
What do tutorials, seminars, lectures, group work sessions etc. have in common?



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**Modern medical programmes are often overloaded with information & requirements**



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**Didactic teaching**

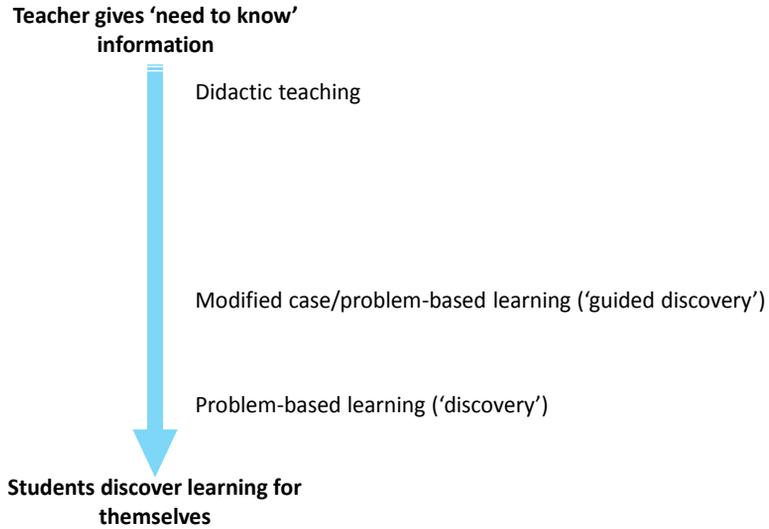
**With didactic teaching we have little way of knowing if the audience is engaged**



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**What is meant by case/problem-based learning?**



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**What is Problem/Case-Based Learning?**

**'Pure' problem/Case-based learning**



**Learner centred discovery**

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## Benefits

### McMaster University reported favourably on their PBL-graduates



Enjoyed medical education

Consider themselves well prepared

Sought after by residency programmes

Perform satisfactorily on licensing exams  
(at or above level of other courses)

Higher performance on MD objectives

Lee & Kwan (1997) McMaster University

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## So how does problem/case-based learning work?

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**What is Problem/Case-Based Learning?**

**'You can only learn what you don't know'** Mueller (McMaster)



Students identify gaps in knowledge and admit them

In traditional curricula students can assume they know everything necessary if they learn the content delivered

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**Ingredients for CBL**



**Clinical case**



**Small group of students**



**Facilitator**

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## The Cases

For effective CBL clinical cases:



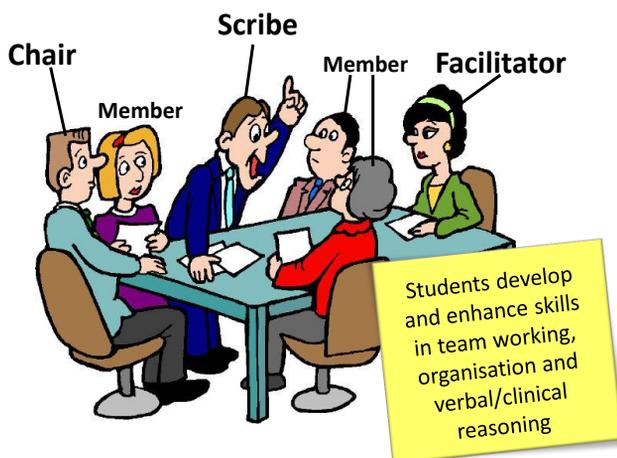
- Must be realistic & cover common conditions
- Be seeded with sufficient triggers
- Reflect current national practice and standards
- Be presented in line with local guidance
- Cover author designated outcomes/objectives

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## The Group

Students work in a small group with a facilitator



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## The group facilitator

Facilitators are there to guide the group and not to teach

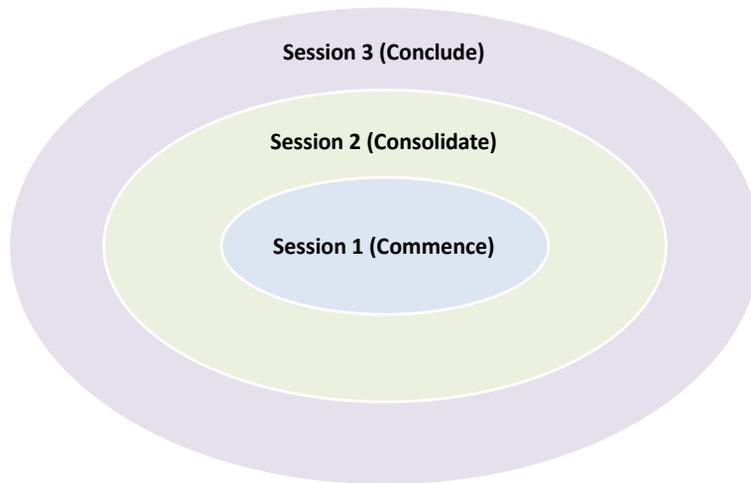


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## CBL Process

In year 1 cases are run in 3 sessions across 1 week with progressive release of information



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## CBL Process

Sam Sparrow a 56 year old male fell 10m from a ladder whilst pruning his trees. At the scene of the incident he was conscious and responsive but unable to move. On the journey to hospital he became pale and sweaty and lost consciousness

## CBL Process

Cases unfold over successive sessions with progressive releases of information

### Session 1

Receive presentation  
Brainstorm  
Identify knowns & unknowns  
Deduce objectives  
Assign objectives  
Go off and research



### Session 2

Share learning  
Receive new information  
Deduce objectives  
Assign objectives  
Go off and research



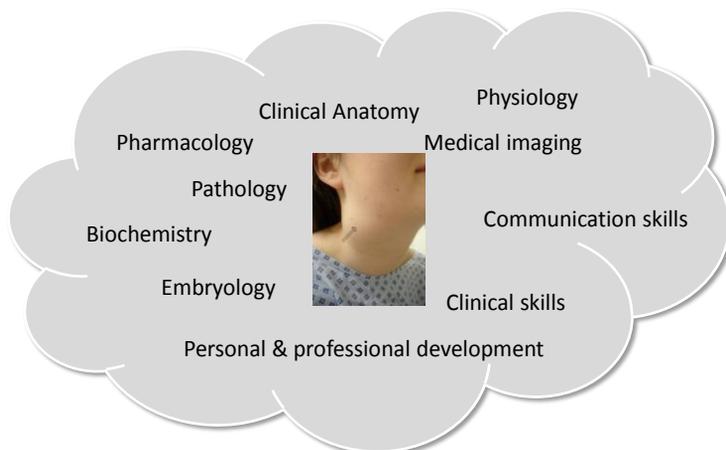
### Session 3

Present findings  
Receive new information  
Deduce objectives  
Decide on further learning



## Case Purpose

Cases act as vehicles to deliver and integrate curricular outcomes



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## Case Purpose

Students discover and generate their own learning outcomes



- History taking
- Embryology (regional / general)
- Regional clinical anatomy
- Infection & immunity
- Tissues of the body
- Lymphatic system
- Ethics & consent
- Patient autonomy

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## Benefits



- ✓ Greater opportunity for integration & holistic approach
- ✓ Patient problem orientated
- ✓ Early tie-in of professional elements
- ✓ Develops team-working skills
- ✓ Enables review of learning against peers

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**Where does CBL fit into a modern medical programme?**

## CBL in a modern medical programme

We are training MBChB students to be practitioners, professionals & lifelong learners



Knowledge is best recalled and applied in the context in which it was originally learned

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## Disadvantages

Some studies have shown mixed results for pure PBL/CBL courses



PBL/CBL Students can show lower performance on knowledge-based assessment during medical school

PBL/CBL Students tend to make more factual mistakes

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**CBL in a modern medical programme**

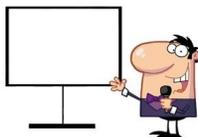
**Modified versions of case/problem-based learning are used**



**'Guided discovery'**

**CBL in a modern medical programme**

**Case-based learning can be blended with more guided/didactic learning experiences**

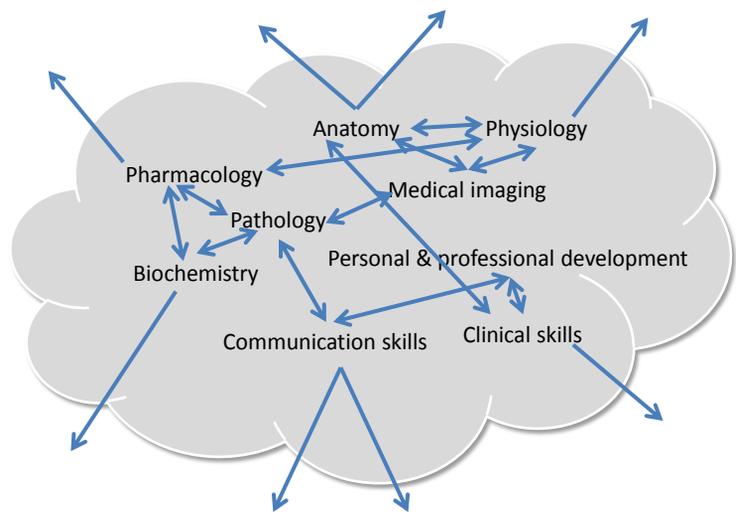


- Act as a resource to inform case learning
- Allow some limits/guidance to be set
- Provides core concepts
- Act as check point for students



**CBL in a modern medical programme**

**Cases help students to contextualise and apply information and to develop links between disciplines**



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**Are there any additional benefits?**



**Additional benefits**



Better interpersonal skills

Better psychosocial knowledge

Better attitude towards patients

(Nandi et al 2000)

**Additional benefits**

**Students develop life-long learning skills**

Encourages breadth vs depth  
(avoid ultimate detail)

Students learn to recognise  
what is important/what they  
need to know



Increases focus within a  
subject area

### Added benefits

Case/problem-based learning is associated with high student & staff satisfaction



University of Nottingham's NSS results from the PBL medical course are excellent

Early insight into practical use of knowledge

Autonomy

Feel valued

Staff-student divide is bridged

Judge self against peers (auto-feedback)

Know how to learn in later years

Interested self-motivated learners

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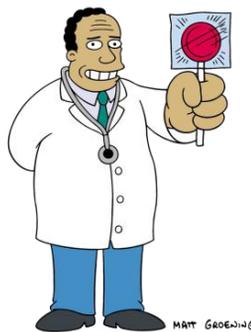
### Additional benefits

Some studies suggest there are few differences between traditional vs CBL/PBL graduates at medical school

Traditional course



CBL course



Differences can appear later – better performance by PBL students in USMLE Step 2 (Thomas et al 2009)

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CBL in a modern medical programme

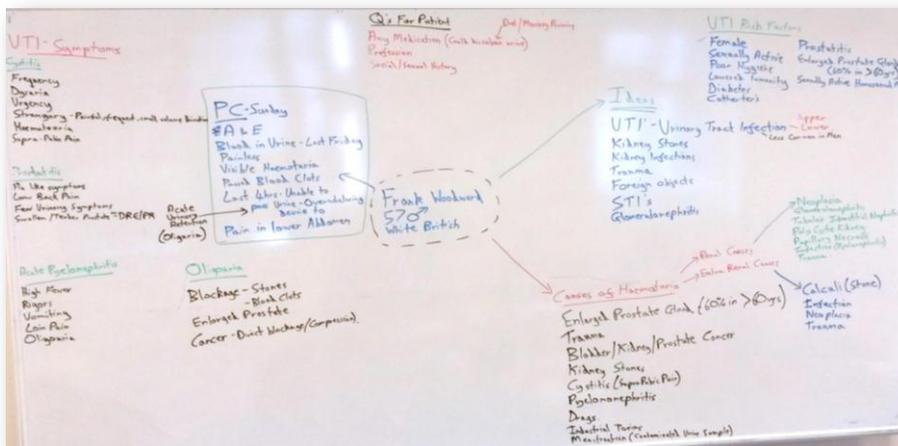
University of Nottingham: Trained graduate-entry students (including non-science & 2:2) to same or higher level than standard 5 year programme using PBL



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CBL Process

Is it working on the Warwick MBChB?



All group members engaged and inputting

Beginning to clinically reason

Already exploring links and applying knowledge

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**CBL Process**

**MBChB Staff report CBL process is more engaging, rewarding and interesting**



**Additional benefits**

**Cake.....**

