

Case-Based Teaching

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Good Morning

It's good
to be a
teacher!

Why use cases in medical training?

- We have a lot of it!
- It helps utilize a lot of brain cells on the part of the trainee and facilitator (that's us!)
- It fosters good role modelling and life long learning :-)

- Teaching in response to case presentations is an essential feature of clinical teaching in medicine. Yet, this form of case-based teaching is often poorly done.

Irby, 1994

Road Map

- Definition of Case-based teaching
- Main characteristics
- What does it assess?
- Advantages
- Disadvantages
- The Cases
- The Facilitator
- Pedagogical Strategies for Organizing Teaching Rounds Using Case-Based Teaching
- Structured Case Vignettes

Definition

- Case-based teaching is an **active** learning strategy in which students **read and discuss simple to complex, real-life scenarios** that call on their **analytical thinking skills and decision-making**

Main Characteristics

- Students **use previously acquired knowledge to solve problems** that are designed to **mimic future professional practice**
- Intended to **obtain key information** and to **use that knowledge effectively**, while encouraging **self-directed learning**
- Consolidation and integration of learning activities

What does it assess?

- Learner's ability to **recognize and interpret important data** to support their decision making pertaining to the case's management
- Learner's ability to **organize and communicate their ideas**
- **Competence of physicians** and the **quality of their actual practice**

Herreid CF. Start with a story: The case study method of teaching college science. National Science Teachers Association; 2007

Peabody JW, Luck J, Glassman P, Dresselhaus TR, Lee M. Comparison of vignettes, standardized patients, and chart abstraction. JAMA 2000;283:1715-22

Advantages

- Encourages learners to **analyze, synthesize and apply knowledge** through the cases
- Allows for **multiple viewpoints**
- Encourages **discussion**
- Help **solidify students' understanding by looking for solutions to the cases themselves** rather than relying passively on teachers for answers

Disadvantages

- Lengthy presentations
- Time consuming
- Fail to actively involve and address needs of all team members
- Sometimes repetitive

The Cases

- Problems that provide the learner with a **background of a patient or other clinical dilemma**
- **Supporting evidence and information** are provided such as: latest research articles, vital signs, clinical signs and symptoms and clinical laboratory results used to stimulate the acquisition of knowledge, skills and attitudes
- Place events in a **context or situation that promotes authentic learning**

The Facilitator

- Main functions:
 1. **assist the students** through the facts
 2. **engage them in analysis** and the development of possible solutions or strategies

Pedagogical Strategies for Organizing Teaching Rounds Using Case-Based Teaching

Case- Bedside
Case- Lecture
Case- Iterative

Case- Bedside Teaching

- **Case discussion** in a conference room **followed by demonstration** at the bedside
- Benefits:
 - **demonstration of skills** at bedside
 - presentation of **practical and relevant teaching points** in the context of specific patients in the service
 - treatment of team members as colleagues
 - questions asked effectively

A 38-year-old executive presents with a three-week history of gnawing mid-epigastric pain relieved with food. The patient has also noticed relief with use of antacids. (1) How should you work this patient up? (2) Treatment? (3) Follow-up?

Case-Lecture Teaching

- Blends quick **review of cases** with **more formal presentations** on related topics
- Steps:
 1. See patients and listen to students' case presentations
 2. Demonstrate proper PE skills to guide students on how to perform them
 3. Do **further questioning and discussion of case**, interspersed with answers from literature and personal experience
- Had mini case presentations and slide presentations of relevant cases

Case-Iterative Teaching

- Involves **discovery learning using complex cases**
- Iterative hypothesis testing by Kassirer and Kopelman
- **Stop-action process** where small amounts of information are provided sequentially as the data were originally available to the team
- At each stage of the discussion the **team thinks aloud about what the problems might be, what further information should be obtained and why**

How do they support experiential learning?

- Experiential learning theory
- Teaching strategies should encourage learners to:
 - **reflect** upon and **evaluate** their own experiences
 - **develop** and **articulate appropriate generalizations**
 - **predict future effects**

5 General Principles of Experiential Learning in the Clinical Setting

1. Anchoring instruction in cases

- cognitive flexibility, illness and instance scripts

2. Actively involving learners

- ask questions, structure problem solving exercises, provide opportunities for reflection on medical practice

3. Modeling professional thinking and action

- being reflective and articulate about one's thinking process; thinking in action; providing scaffolding, cues, filtering

5 General Principles of Experiential Learning in the Clinical Setting

4. Providing direction and feedback

- observe students and residents in action, provide guided practice and provide specific feedback; identify and correct misconceptions

5. Creating a collaborative learning environment

- demonstrate caring concern for their patients and their team members; establish a working climate in which questions could be asked, ideas challenged, information freely shared

Structured Case Vignettes

Definition

- Special type of clinical teaching case used primarily to measure:
 1. trainees' **knowledge and clinical reasoning**
 2. **skills** in performing the tasks necessary to **diagnose and care for the patient** (history taking skills, PE skills, judicious ordering of diagnostic tests, and ability to arrive at a preliminary diagnosis and plan for management)
- Ability to capture data comes from their structure
 - **case divided into sections**
 - sections are **sequentially presented** to the trainee

Classic Sections of the Medical Visit

- Chief complaint
- History
- Physical exam
- Laboratory
- Radiographic studies
- Assessment
- Plan

Narrative describing a situation

Question or series of questions

Trainee will explain how he will care for the patient given the information presented

Each section is presented in chronological order

Down Syndrome child with cough & difficulty of breathing

CHIEF COMPLAINT: A 6 month old baby boy with Down Syndrome was brought to the ER due to high grade fever, cough and difficulty of breathing

What are the 5 most important questions you want to ask the care giver about this baby's cough, fever and difficulty of breathing in the recent past (history of present illness)?

Answers:

1. _____
2. _____
3. _____
4. _____
5. _____

HISTORY OF PRESENT ILLNESS:

The baby had a 1 week history of on and off high grade fever (Tmax 39C) & cough, given paracetamol 100mg/ml drops (10mkdose) 4 hours w/ temporary relief. He was brought to the health center on the 3rd day of illness, given amoxicillin 100mg/ml drops (40mkday) 3x/day and told to increase fluids. He was brought to the ER due to cyanosis when coughing, and no improvement despite antibiotic intake

REVIEW OF SYSTEMS: He has poor appetite, barely breastfeeding, no diarrhea, had 10 vomiting episodes

List 10 other questions you want to ask the caregiver in order to complete the history

Answers:

1. _____
2. _____
3. _____
4. _____
5. _____

Down Syndrome child with cough & difficulty of breathing

PAST MEDICAL HISTORY: Was hospitalized at 2 and 3 months due to pneumonia, had frequent bouts of URTI and AGE in between, had history of allergic dermatitis

FAMILY MEDICAL HISTORY: only child of a 44 y/o seamstress and a 40 y/o gov't employee, maternal diabetes and hypertension

BIRTH AND MATERNAL HISTORY: Born FT in a tertiary gov't hospital, no complications, AS 8,9;
Maternal UTZ at 6 months AOG showed Down Syndrome, wanted pregnancy, 8 prenatal check ups

NUTRITION: Purely breastfed

IMMUNIZATION: BCG, 3 OPV/DPT/Hib, 4 Hep B from LHC

DEVELOPMENTAL: still with head lag, turns to side, reaches for objects, babbles, puts hand in mouth

What are the 8 most important elements of the physical exam that need to be performed on this patient? Please include your expected findings for organ system that you will examine.

Answers:

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____

Down Syndrome child with cough & difficulty of breathing

PHYSICAL EXAM: Irritable, fussy, in respiratory distress; HR 120s, RR 70s, T 38.6C; Wt 4.8kg, Lt 58cm, HC 38.5cm; **HEENT:** almond shaped eyes, low set ears, hyperemic tonsils; **Chest:** harsh breath sound, rales all over, tachycardic, normal rhythm, gr. 4/6 holosystolic murmur on 4th ICS L; **Abdomen:** soft, globular, NABS, no organomegaly; **Extremities:** slightly cyanotic nailbeds, fair pulses, clammy hands and feet

PRELIMINARY DIAGNOSES:

1. What is the most likely cause of her cough & difficulty of breathing?
2. What are at least 2 other possible causes of her cough?
3. What is an important comorbid feature in this child that contributes to her difficulty of breathing?

Answers:

1. _____
2. _____
3. _____

List 5 laboratory tests/ imaging studies that will you order and the reasons for ordering such tests?

Answers:

1. _____
Reason: _____
2. _____
Reason: _____
3. _____
Reason: _____
4. _____
Reason: _____
5. _____
Reason: _____

Down Syndrome child with cough & difficulty of breathing

LABS/ STUDIES: Hgb 100, hct 0.29, WBC 20, segmenter predominant, plt 180. Electrolytes: NA 130, K 3.5, Na 100; Chest xray showed infiltrates on mid and lower lung fields on both lungs: 2-D echo showed VSD 0.6cm, PDA, EF 55: Blood CS after 2 days showed growth of *S. pneumoniae*

What is/are your final diagnosis/es for this child?
Please the rationale for each answer.

Answers:

1. _____
2. _____
3. _____

MANAGEMENT: How will you manage this patient?
Indicate any medications you might give, including dose and duration, and any further tests you may wish to order. Include any referrals you may want to do during his admission. How will you counsel the caregiver about the child's condition?

Answers:

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____

Summary

- Case based teaching (CBT) allows for experiential learning where both learners and teachers actively participate and collaborate through the use of cases
- Allows for analytical thinking and decision making on the part of the learner, and role modelling on the part of the teacher
- Different strategies:
 - Case-Bedside (conference room lecture then bedside)
 - Case-Lecture (bedside then conference room discussion)
 - Case-Iterative (discussion of complex cases in stop-action process)
- Structured case vignettes are variants of CBT, presenting and discussing a case in sections, with well-directed questions used to come up with solutions to patient issues

Thank you for your attention!