Case Scenarios on Cognitive Biases In Clinical Decision Making

Case 1

Learning objectives for students:
- To test your ability to identify the signal in a high noise-to-signal ratio case.
- To identify cognitive biases that are common in managing a manipulative, anxious patient with complex medical problems

Case scenario:
A 23-year old salesman presents to an emergency department complaining of acute onset of shortness of breath and central chest discomfort for 3 hours prior to arrival. He appears anxious, sweaty and feverish. He says that he had two episodes of passing loose stools and vomiting the night before, claiming that it could possibly be due to eating curry noodles for dinner. At the triage counter, he says that his term paper for a course in a part-time degree program is due in three days' time and he requests that the doctor gives him a 1-day medical leave.

His initial vital signs are: BP 140/90 mmHg, PR 140/min, temperature 39°C (102.2°F) and respiratory rate 30/min. The physician's assistant at triage counter gives him with a diagnosis of "acute gastroenteritis" and treats him with 500 ml of normal saline solution.

About half an-hour later, when seen by an attending physician, the patient says that he was having a drink with his friends at a nightclub and "just to unwind from the stress of his job." He admits to consuming cocaine during the party. He also admits that he consumes cocaine "on a regular basis". After the party, he had curry noodles at a nearby restaurant.

Nonetheless, except for some mild chest discomfort, he says he feels much better after the intravenous saline and impatiently requests to be discharged with a day of medical leave. The attending physician finds no significant findings on physical examination. His volume status is good.

Questions:
1. **If you were the doctor that attends to him, would you have discharged him with a one-day medical leave certificate? Why or why not? (suggested total points: 5 points)**

2. **What could have influenced the attending doctor's thinking process in concluding that there is "no significant finding on physical examination"? (suggested total point: 1 point)**
3. **List your provisional and differential diagnoses for this patient according to their pre-test probabilities. Explain your answers. (suggested total points: 3 points)**

Differential diagnosis	Pre-test probability [Tick (✓) where appropriate]			Comments
	Low probability	**Moderate probability**	**High probability**	

4. **What additional clinical information do you want (history, physical exam, laboratory or imaging) and why do you want it? (suggested total points: 1 point)**

Case 2

Learning objectives for students:
- To assess your ability to pick up the potential red flags of headache in this case.
- To identify cognitive biases that are common in managing a case of headache by a doctor in fatigue state

Case scenario:

A 40-year-old female presents to an emergency department at 3.00 am with a headache. Upon arrival to the emergency department, her vital signs are: BP 150/100 mmHg, heart rate 90/min, temperature 37°C (98.6°F) and respiratory rate 35/min.

She describes the headache as a generalized headache with sudden onset (describe as "thunder clap headache"). When asked further, she says that she has had similar episodes of headache in the past but she feels that her current episode is the worst ever headache she ever has. Her pain score at this time is 10/10 but the attending doctor finds no abnormality from physical examination.

She is then treated with intravenous diclofenac sodium and is kept under observation. Several hours later, when re-examined by another doctor, she says that her headache has significantly improved with a pain score of 6/10. But now she also complains of some neck pain. Nonetheless, she insists on going home as she says she has a lot of house chores to do. The doctor discharges her accordingly.

Questions:

1. **If you were the doctor in charge, would you have discharged her at this juncture as per her insistence? Or would you have admitted her to the ward? Why or why not? (suggested total points: 5 points)**

2. **Is the doctor's action on discharging her an example of predominantly Type 1 or predominantly Type 2 decision making? (suggested total points: 1 point)**

3. **List your provisional and differential diagnoses for this patient according to their pre-test probabilities. Explain your answers. (Total marks: 3 points)**

Differential diagnosis	Pre-test probability [Tick (✓) where appropriate]			Comments
	Low probability	**Moderate probability**	**High probability**	

4. **What additional clinical information do you want (history, physical exam, laboratory or imaging) and why do you want it? (suggested total points: 1 point)**

Case 3

Learning objectives for students:
- o To assess your ability to analyze the trend or the dynamics of vital signs changes
- o To identify cognitive biases that are common in managing a patient with complex medical problems in a busy clinical setting

Case scenario:
On New Year's Eve, a 50-year old male patient is brought in by the ambulance to a emergency department with complaints of epigastric pain associated with sweating. This patient has history of hypertension for which he takes a beta-blocker and an angiotensin-converting enzyme (ACE) inhibitor. He also takes ibuprofen, as needed, for arthritis. His initial vital signs upon arrival to the emergency department are: BP 150/90 mmHg, pulse rate 70/min, temperature 37°C (98.6°F) and respiratory rate 25/min. The triage nurse thinks that this patient probably has acute coronary syndrome. On examination, he is pale and his epigastric region is tender. His ECG shows an ST depression in the lateral leads. His blood sugar is 234 mg/dl. The attending doctor agrees with the diagnosis of acute coronary syndrome. Half an hour later, when re-examined, the patient says that his epigastric pain has improved. His BP now is 90/60 mmHg and pulse rate 90/min.

Questions:

1. **List your provisional and differential diagnoses for this patient according to their pre-test probabilities. Explain your answers. (Total marks: 6 points)**

Differential diagnosis	Pre-test probability [Tick (✓) where appropriate]			Comments
	Low probability	Moderate probability	High probability	

2. **What additional clinical information do you want (history, physical exam, laboratory or imaging) and why do you want it? (suggested total points: 3 points)**

3. **Which predominant type of cognitive process the attending doctor is using in agreeing with the diagnosis of acute coronary syndrome? (suggested total points: 1 point)**

Case 4

Learning objectives for students:
- o To assess your ability to correlate clinical findings with findings from the laboratory/radiological investigations
- o To identify cognitive biases that can happen especially when there are disagreements with another doctor from another field

Case scenario:

A 37-year old male patient, with no previous medical illness, is brought to the emergency department at midnight with a complaint of bilateral progressive lower limb numbness and weakness for a week. He says that the numbness starts at the level of the umbilicus and progresses distally. He also complains of occasional low back pain, which he believes is due to a road traffic accident that occurred 3 years ago. On examination, his vital signs are: BP 111/65 mmHg, HR 90/min, Temperature 37°C (98.6°F), SaO2 98% under room air. Muscle strength is 4/5 in the bilateral lower extremities; strength is 5/5 in the upper extremities.

His lumbrosacral X-ray shows evidences of a compression fracture of the vertebral body of L1 with osteophytes formation. The resident who sees the patient thinks that his symptoms are most probably due to the fracture and suggests that he could be discharged with an out-patient appointment in the orthopedic clinic.

Questions:
1. **Would you discharge this patient as suggested by the attending doctor or would you admit him? Explain your answer. (suggested total points: 6 points)**

2. **Is the resident's decision that this patient could be discharged an example of predominantly Type 1 or Type 2 thinking? (suggested total points: 1 point)**

3. **What are your other differential diagnoses to consider for this patient? Why? (suggested total points: 2 points)**

Differential diagnosis	Pre-test probability [Tick (✓) where appropriate]			Comments
	Low probability	Moderate probability	High probability	

4. **What additional information in the case presentation should prompt the attending doctor to re-evaluate the decision to discharge? (suggested total points: 1 point)**

<u>**Case 5**</u>

<u>**Learning objectives for students:**</u>
- o To assess your ability to identify red flags suggestive of intra-cranial injury secondary to the fall.
- o To identify cognitive biases that can happen in an elderly patient where the clinical manifestations may be more subtle than expected

<u>**Case scenario:**</u>
A 72 year-old lady with a history of hypertension and a right eye cataract comes to the emergency department after falling from a height of about one meter high step ladder at around 6.00 am. The family believes that the patient's fall was due to her poor eyesight. No history of loss of consciousness and she can remember the complete history of the fall. When the patient is first examined in the emergency department, she is fully conscious, alert and orientated; her GCS 15/15. Except for a small abrasion on the right elbow, no other findings are noted on examination. A skull x-ray reveals no fracture. Other than complaining of a headache and having three episodes of vomiting in the emergency department, she is well. The attending doctor is contemplating discharging this patient.

Questions:
1. **Would you have discharged the patient at this juncture? Explain your answer (suggested total marks: 5 points).**

2. **Is the doctor's plan on discharging her an example of predominantly Type 1 or predominantly Type 2 decision making? (suggested total marks: 1 point)**

3. **What your provisional and differential diagnoses for this patient according to their pre-test probabilities. Explain your answers (suggested total marks: 3 points)**

Differential diagnosis	Pre-test probability likelihood [Tick (✓) where appropriate]			Explanation
	Low probability	Moderate probability	High probability	

4. **What additional clinical information do you want (history, physical exam, laboratory or imaging) and why do you want it?" (suggested total marks: 1 point)**