PERFORMING A CASE ANALYSIS

Now that you have a case selected, the next step is to do a proper case analysis in preparation for the actual M&M rounds presentation. Keep in mind that the ultimate goal of your M&M rounds is to discuss cases of adverse outcomes which provide lessons that may help prevent future adverse outcomes and improve quality of care. To that end, we recommend that you review your case from two perspectives:

1. Were there any *cognitive biases* that contributed to the outcome?
2. Were there any *system issues* which contributed to the outcome?

Cognitive Biases

Clinical decision-making is an extremely complex process, and healthcare professionals often develop adaptive mechanisms (referred to as *heuristics*) because we are faced with repeated similar experiences in a busy clinical environment. There is a large body of psychology literature which has developed the widely accepted dual process theories (DPTs) of reasoning in trying to understand how we subconsciously utilize Type 1 (intuitive, fast) vs Type 2 (analytical, slow) processes, and how clinicians predictably make cognitive errors as a result of well-defined biases[13,14]. It has been proposed that one of the best ways we can combat these decision-making errors is to first explicitly be made aware of these biases. We can then develop cognitive forcing strategies to prevent them in the future[10].

To help you identify potential cognitive biases that may have contributed to your M&M rounds case, **Appendix B** provides a summary of some of the more common diagnostic cognitive biases. Remember that many of these are common "cognitive traps" that any one of your colleagues in the same situation could have been subject to. As human beings we are all subject to these regardless of our level of training or expertise. Framing your discussions around these biases will help encourage an open, blame-free forum where lessons can be learned.

Be aware that hindsight bias can creep in when reviewing cases too. Consider the information that was available and observable at the time the event was unfolding : what seems obvious now was anything but, then. Explore together 'why it made sense at the time'. Encourage the group to avoid viewing an event through the "retrospectoscope", which can lead to oversimplifications of explanation and, at times, a blaming mindset, of ourselves and/or others.

System Issues

System-level issues often relate to problem(s) beyond just the individual clinician or team, and pertains to how your clinical setting operates. The following is one example of how system issues can be categorized[15]:

- Patient factors: e.g. any communication barrier (due to language, intoxication, obtunded, critically ill, etc.), or behaviour eliciting affective bias
- Skill-set errors: e.g. procedural complications or errors in interpretation of ECGs, laboratory/diagnostic imaging tests
- Task-based errors: e.g. failure of routine behaviours such as regular bedside care, attention to vital signs and appropriate monitoring (often reflects work overload)
- Personal impairment: e.g. personal factors that impact job performance such as fatigue, illness, emotional distress
- Teamwork failure: e.g. breakdown in communication between team members, across shifts, between teams, and across specialty boundaries, or due to inappropriate assignment of unqualified personnel to a given task - this includes resident and student supervision
- Local environmental contributors: e.g. appropriate staffing, stocking, functional equipment, sufficient policies and guidelines
- Hospital-wide contributors: e.g. access to patient services, consultants, inpatient beds, specialty treatments
- Hospital administration contributors: e.g. budgetary constraints, hospital policies and guidelines
- External contributors: e.g. paramedic services, provincial regulations and priorities, public health campaigns

There are often multiple cognitive/system issues at play to ultimately lead to an adverse outcome. Consider Reason's Swiss Cheese Model of error causation:

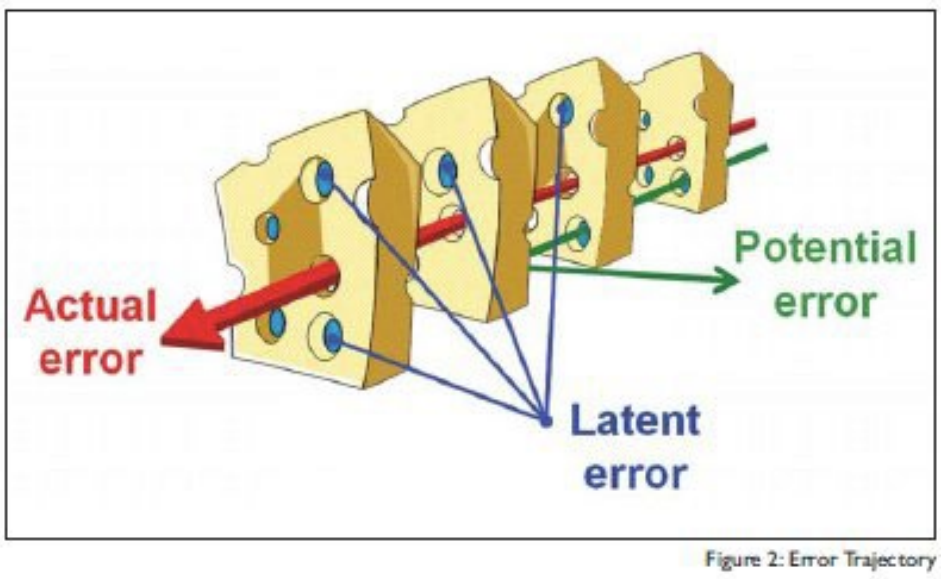

Figure 2: James Reason's Swiss Cheese Model[16]

The different layers can represent points throughout a patient's journey where cognitive and/or system errors could potentially have been prevented. Using such frameworks to systematically review your M&M rounds case will help you identify cognitive and system issues that may have gone unnoticed at first glance.

Appendix B: Classification Scheme for Cognitive Dispositions to Respond (CDRs)

Errors of Over-Attachment to a Particular Diagnosis

• **Anchoring:** the tendency to perceptually lock on to salient features in the patient's initial presentation too early in the diagnostic process and failing to adjust this initial impression in the light of later information. This CDR might be severely compounded by the Confirmation Bias.

• **Confirmation bias:** the tendency to look for confirming evidence to support a diagnosis rather than look for disconfirming evidence to refute it, despite the latter being more persuasive and definitive.

• **Premature closure:** a powerful CDR accounting for a high proportion of missed diagnoses. It is the tendency to apply premature closure to the decision making process, accepting a diagnosis before it has been fully verified. The consequences of the bias are reflected in the maxim: "when a diagnosis is made, the thinking stops."

Errors Due to Failure to Consider Alternative Diagnoses

• **Multiple alternative bias**: a multiplicity of options on a differential diagnosis might lead to significant conflict and uncertainty. The process might be simplified by reverting to a smaller subset with which the physician is familiar, but might result in inadequate consideration of other possibilities. One such strategy is the 3 diagnosis differential: "it is probably A, but it might be B, or I don't know (C)". Although this approach has some heuristic value, if the disease calls in the C category and is not pursued adequately, it minimized the change that serious diagnoses are made.

• **Representativeness bias:** drive the diagnostician toward looking for prototypical manifestations of disease: "if it looks like a duck, walks like a duck, quacks like a duck, then it is a duck." Yet, restraining decision making along these pattern recognition lines leads to atypical variants being missed.

• **Search satisficing:** reflects the universal tendency to call of a search once something is found. Co-morbidities, second foreign bodies, other fractures, and co-ingestants in poisoning may all be missed.

Errors Due to Inheriting Someone Else's Thinking

• **Diagnostic momentum:** once diagnostic labels are attached to patients they tend to become stickier and stickier. Through intermediaries (patients, paramedics, nurses, physicians) what might have started as a possibility gathers increasing momentum until it becomes definite, and other possibilities are excluded.

• **Framing effect**: how diagnosticians see things might be strongly influenced by the way in which the problem is framed, e.g. physicians' perceptions of risk to the patient may be strongly influenced by whether the outcome is expressed in terms of the possibility that the patient might die or might live. In terms of diagnosis, physicians should be aware of how patients, nurses, and other physicians frame potential outcomes and contingencies to the clinical problem to them.

• **Bandwagon effect:** the tendency for people to believe and do certain things because many others are doing so. Group-think is an example, and it can have a disastrous impact on team decision making and patient care.

Errors in Prevalence Perception or Estimation

• **Availability bias:** the disposition to judge things as being more likely, or frequently occurring, if they readily come to mind. Thus, recent experience with a disease might inflate the likelihood of its being diagnosed. Conversely, if a disease has not been seen for a long time (is less available), it might be underdiagnosed.

• **Base-Rate neglect:** the tendency to ignore the true prevalence of a disease, either inflating or reducing its base-rate, and distorting Bayesian reasoning. However, in some cases clinicians might (consciously or otherwise) deliberately inflate the likelihood of disease, such as in the strategy of "rule out worst-case scenario" to avoid missing a rare but significant diagnosis.

• **Hindsight bias**: knowing the outcome might profoundly influence perception of past events and prevent a realistic appraisal of what actually occurred. In the context of diagnostic error, it may compromise learning through either an underestimation (illusion of failure) or overestimation (illusion of control) of the decision maker's abilities.

Errors Involving Patient Characteristics or Presentation Context

• **Fundamental attribution error:** the tendency to be judgemental and blame patients for their illness (dispositional causes) rather than examine the circumstances (situational factors) that might have been responsible. In particular, psychiatric patients, minorities, and other marginalized groups tend to suffer from this CDR. Cultural differences exist in terms of the respective weights attributed to dispositional and situational causes.

• **Triage cueing:** the triage process occurs throughout the healthcare system, from the self-triage of patients to the selection of a specialist by the referring physician. Many CDRs are initiated at triage, leading to the maxim: "geography is destiny." Once a patient is referred to a specific discipline, the bass within that discipline to look at the patient only from their own perspective is referred to as "deformation professionnelle".

• **Ying-yang out:** when patients have been subjected to exhaustive and unavailing diagnostic investigations, they are said to have been worked up the yin-yang. The yinyang out is the tendency to believe that nothing further can be done to throw light on the dark place where, and if, any definitive diagnosis resides for the patient, i.e. the physician is let out of further diagnostic effort. This might prove ultimately to the true, but to adopt the strategy at the outset is fraught with the change of a variety of errors.

Errors Associated with Physician Affect, Personality, or Decision Style

• **Commission bias:** results from the obligation toward beneficence, in that harm to the patient can only be prevented by active intervention. It is the tendency toward action rather than inaction. It is more likely in over-confident physicians. Commission bias is less common than omission bias.

• **Omission bias:** the tendency toward inaction and rooted in the principle of non-maleficence. In hindsight, events that have occurred through the natural progression of a disease are more acceptable than those that may be attributed directly to the action of the physician. The bias might be sustained by the reinforcement often associated with not doing anything, but it may prove disastrous. Omission biases typically outnumber commission biases.

• **Outcome bias:** the tendency to opt for diagnostic decisions that will lead to good outcomes, rather than those associated with bad outcomes, thereby avoiding chagrin associated with the latter. It is a form of value bias in that physicians might express a stronger likelihood in their decision-making for what they hope will happen rather than for what they really believe might happen. This may result in serious diagnoses being minimized.

• **Over confidence/under confidence:** a universal tendency to believe we know more than we do. Overconfidence reflects a tendency to act on incomplete information, intuitions, or hunches. Too much faith is placed in opinion instead of carefully gathered evidence.

• **Zebra retreat:** occurs when a rare diagnosis (zebra) figures prominently on the differential diagnosis but the physician retreats from it for various reasons: perceived inertia in the system and barriers to obtaining special or costly tests; self-consciousness and under confidence about entertaining a remote and unusual diagnosis and gaining a reputation for being esoteric; the fear of being seen as unrealistic and wasteful of resources; under- or overestimating the base-rate for the diagnosis; team members may exert coercive pressure to avoid wasting the team's time; inconvenience of the time of day or weekend and difficulty getting access to specialists; unfamiliarity with the diagnosis might make the physician less likely to go down an unfamiliar road; fatigue or other distractions may tip the physician toward retreat.