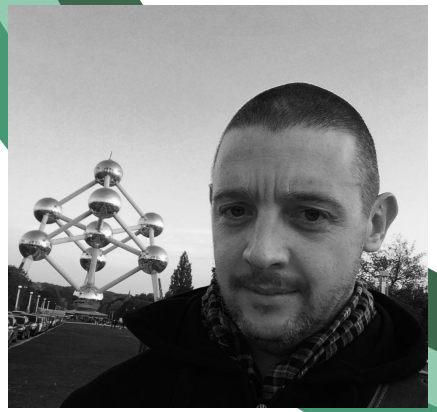
WEBINAIRE



Comment notre cerveau nous tend des pièges ?

Xavier Bertrand Urgentiste Hopital Citadelle

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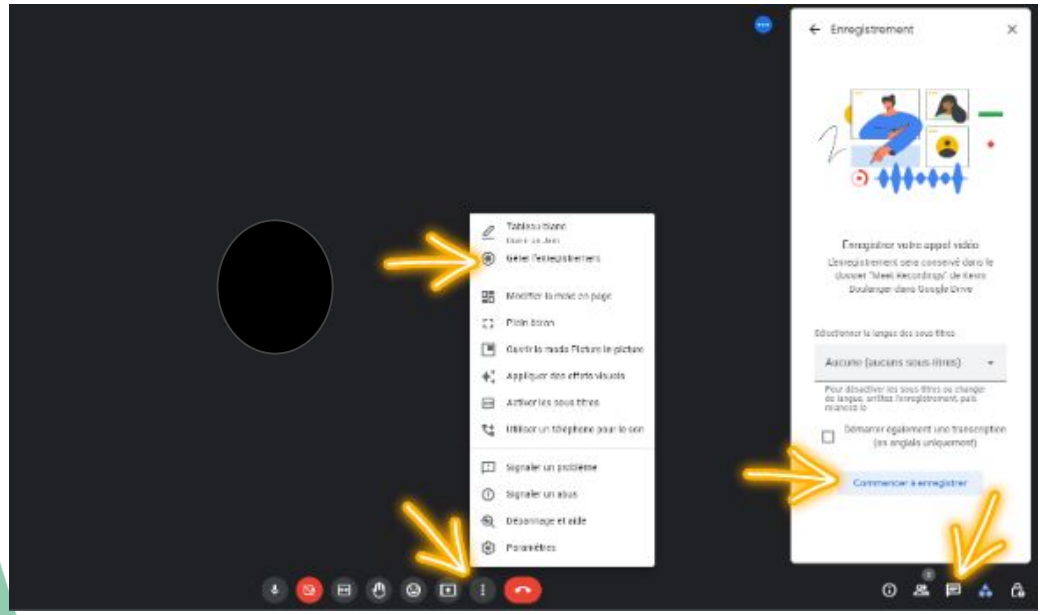
PREAMBULE

1/ Séance enregistrée (anonymisée)

2/ Interaction par le chat (en bas à droite)



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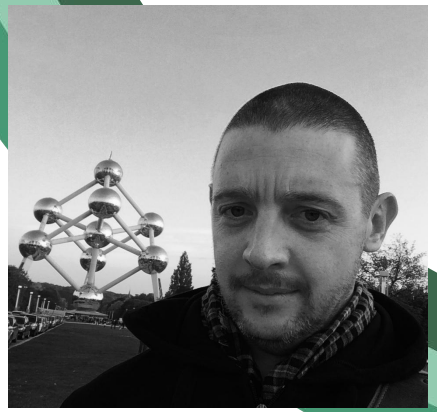

Comment notre cerveau nous tend des pièges ?

Xavier Bertrand Urgentiste Hopital Citadelle

PRÉSENTATION DE L'ORATEUR

- Docteur en médecine
- Interniste Générale
- TPPSU
- Urgentiste depuis 15 ans et en qualité de chef-adjoint au service des urgences d'un CHR, je suis souvent au cœur des situations de dépôt de plaintes et d'échecs de diagnostic ; les mécanismes qui sous tendent ces erreurs mal nommées me passionnent.

Conflit d'intérêt

- Néant

Sommaire

1. Les erreurs de diagnostic
2. Dual process theories of thinking (comment fonctionne notre cervelle)
3. Heuristiques et biais cognitifs
4. Cas clinique
5. Des solutions ?
6. Questions
7. Take Home Messages

Erreurs de diagnostic

Plus fréquentes en médecine générale, médecine d'urgence et en médecine interne !

15 %

Review > Eur J Intern Med. 2013 Sep;24(6):525-9. doi: 10.1016/j.ejim.2013.03.006.
Epub 2013 Apr 6.

Cognitive diagnostic error in internal medicine

Kees van den Berge [1], Sílvia Mamede

Affiliations + expand

PMID: 23566942 DOI: 10.1016/j.ejim.2013.03.006

We link Care

Erreurs de diagnostic

Compatible avec séries autopsiques qui mettent en évidence des erreurs sur l'appréciation de la cause de la mort dans

8 à 24 % des cas

Avec une causalité directe dans 4,1 à 6,7% des cas !!

Review > JAMA. 2003 Jun 4;289(21):2849-56. doi: 10.1001/jama.289.21.2849.

Changes in rates of autopsy-detected diagnostic errors over time: a systematic review

Kaveh G Shojania [1], Elizabeth C Burton, Kathryn M McDonald, Lee Goldman

Affiliations + expand

PMID: 12783916 DOI: 10.1001/jama.289.21.2849

We link Care

Erreurs de diagnostic

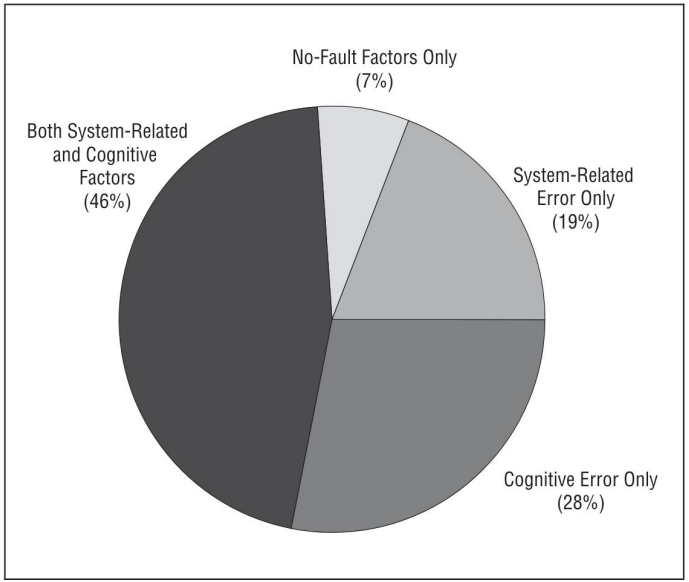

Figure. The categories of factors contributing to diagnostic error in 100 patients.

Comparative Study > Arch Intern Med. 2005 Jul 11;165(13):1493-9.
doi: 10.1001/archinte.165.13.1493.

Diagnostic error in internal medicine

Mark L Graber [1], Nancy Franklin, Ruthanna Gordon

Affiliations + expand

PMID: 16009864 DOI: 10.1001/archinte.165.13.1493

We link Care

Erreurs de diagnostic

Les erreurs ne sont que **rarement causées par notre ignorance** (4%) mais bien par la façon dont nous prenons des décisions !

Comparative Study > Arch Intern Med. 2005 Jul 11;165(13):1493-9.
doi: 10.1001/archinte.165.13.1493.

Diagnostic error in internal medicine

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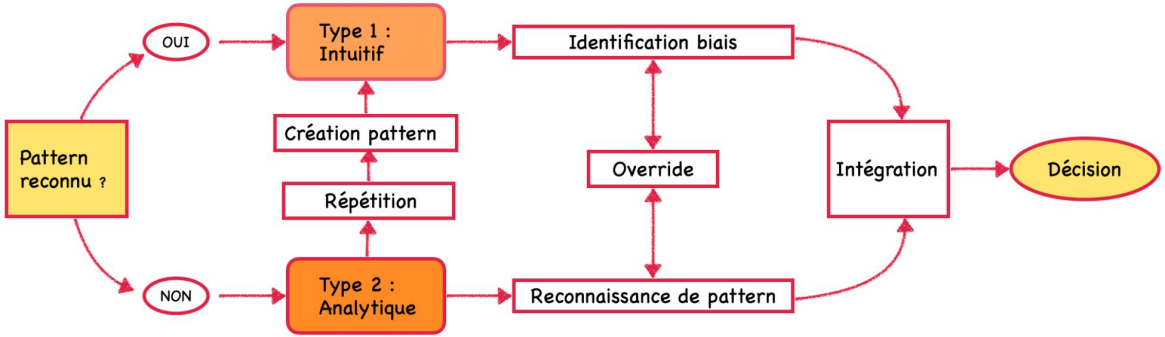
Dual process theories of thinking



Dual process theories of thinking

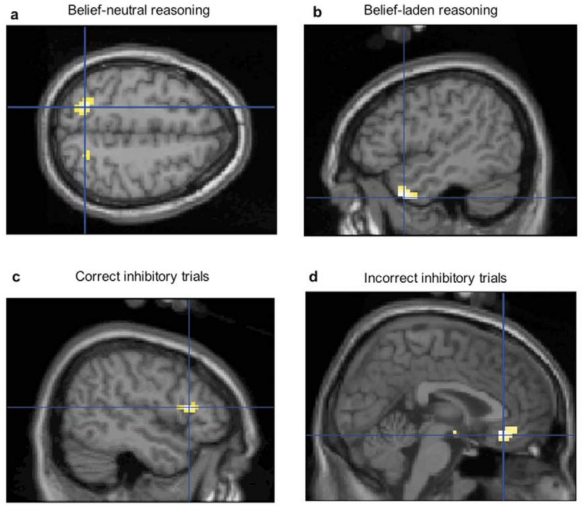
› Cognition. 2003 Feb;87(1):B11-22. doi: 10.1016/s0010-0277(02)00185-3.

Explaining modulation of reasoning by belief

Vinod Goel [1], Raymond J Dolan

Affiliations + expand

PMID: 12499108 DOI: 10.1016/s0010-0277(02)00185-3



Dual process theories of thinking

Analytique	Intuitif
• Lent • Conscient • « Energivore » • Peu influencé par le contexte • Peu sujet aux erreurs	• Rapide • « Autonome » • « Economique » • Dépendant du contexte • Sujet aux erreurs et aux biais cognitifs

We link Care

Heuristique

- Raccourci dans le raisonnement
- Typique du système 1
- Permet de gagner du temps et de gagner en efficacité
- Sujet à des biais qu'il est important de connaître afin de pouvoir les reconnaitre lorsque les circonstances favorisent leur survenue.

Biais cognitifs

Cognitive Dispositions to Respond (CDRs) That May Lead to Diagnostic Error*

Aggregate bias: when physicians believe that aggregated data, such as those used to develop clinical practice guidelines, do not apply to individual patients (especially their own), they are invoking the *aggregate fallacy*. The belief that their patients are atypical or somehow exceptional may lead to errors of commission, e.g., ordering x-rays or other tests when guidelines indicate none are required.

Anchoring: the tendency to perceptually lock onto 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 may be severely compounded by the *confirmation* bias.

Ascertainment bias: occurs when a physician's thinking is shaped by prior expectation; *stereotyping* and *gender* bias are both good examples.

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

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.

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 often being more persuasive and definitive.

Diagnosis 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 all other possibilities are excluded.

Feedback sanction: a form of *ignorance trap* and *time-delay trap* CDR. Making a diagnostic error may carry no immediate consequences, as considerable time may elapse before the error is discovered, if ever, or poor system feedback processes prevent important information on decisions getting back to the decision maker. The particular CDR that failed the patient persists because of these temporal and systemic sanctions.

Framing effect: how diagnosticians see things may 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 of the clinical problem to them.

Fundamental attribution error: the tendency to be judgmental and blame patients for their illnesses (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.

Gambler's fallacy: attributed to gamblers, this fallacy is the belief that if a coin is tossed ten times and is heads each time, the 11th toss has a greater chance of being tails (even though a fair coin has no memory). An example would be a physician who sees a series of patients with chest pain in clinic or the emergency department, diagnoses all of them with an acute coronary syndrome, and assumes the sequence will not continue. Thus, the pretest probability that a patient will have a particular diagnosis might be influenced by preceding but independent events.

Gender bias: the tendency to believe that gender is a determining factor in the probability of diagnosis of a particular disease when no such pathophysiological basis exists. Generally, it results in an overdiagnosis of the favored gender and underdiagnosis of the neglected gender.

Hindsight bias: knowing the outcome may profoundly influence the 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.

Multiple alternatives bias: a multiplicity of options on a differential diagnosis may lead to significant conflict and uncertainty. The process may be simplified by reverting to a smaller subset with which the physician is familiar but may result in inadequate consideration of other possibilities. One such strategy is the three-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 falls in the C category and is not pursued adequately, it will minimize the chances that some serious diagnoses can be made.

Omission bias: the tendency toward inaction and rooted in the principle of nonmaleficence. 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 may be sustained by the reinforcement often associated with not doing anything, but it may prove disastrous. Omission biases typically outnumber commission biases.

Order effects: information transfer is a U-function: we tend to remember the beginning part (primacy effect) or the end (recency effect). Primacy effect may be augmented by anchoring. In transitions of care, in which information transferred from patients, nurses, or other physicians is being evaluated, care should be taken to give due consideration to all information, regardless of the order in which it was presented.

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 may 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.

Continued

Overconfidence bias: 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. The bias may be augmented by both *anchoring* and *availability*, and catastrophic outcomes may result when there is a prevailing *commission* bias.

Playing the odds: (also known as *frequency gambling*) is the tendency in equivocal or ambiguous presentations to opt for a benign diagnosis on the basis that it is significantly more likely than a serious one. It may be compounded by the fact that the signs and symptoms of many common and benign diseases are mimicked by more serious and rare ones. The strategy may be unwitting or deliberate and is diametrically opposed to the rule out worst-case scenario strategy (see *base-rate neglect*).

Posterior probability error: occurs when a physician's estimate for the likelihood of disease is unduly influenced by what has gone on before for a particular patient. It is the opposite of the *gambler's fallacy* in that the physician is gambling on the sequence continuing, e.g., if a patient presents to the office five times with a headache that is correctly diagnosed as migraine on each v Common things for most patients continue to be common, and the potential for a nonb probability.

Premature closure: a powerful CDR accounting for a high proportion of missed diagnoses making process, accepting a diagnosis before it has been fully verified. The consequence made, the thinking stops."

Psych-out error: psychiatric patients appear to be particularly vulnerable to the CDRs d some of which may exacerbate their condition. They appear especially vulnerable to conditions may be overlooked or minimized. A variant of psych-out error occurs when abnormalities, CNS infections, head injury) are misdiagnosed as psychiatric condition

Representativeness restraint: the representativeness heuristic drives the diagnostician to looks like a duck, walks like a duck, quacks like a duck, then it is a duck." Yet restraining atypical variants being missed.

Search satisfying: reflects the universal tendency to call off a search once something is and coingestants in poisoning may all be missed. Also, if the search yields nothing, looking in the right place.

Sutton's slip: takes its name from the apocryphal story of the Brooklyn bank-robber Willie is alleged to have replied: "Because that's where the money is!" The diagnostic strate slip occurs when possibilities other than the obvious are not given sufficient conside

Sunk costs: the more clinicians invest in a particular diagnosis, the less likely they may b form of CDR more associated with investment and financial considerations. However, and, for some, ego may be a precious investment. *Confirmation bias* may be a manifes

Triage cueing: the triage process occurs throughout the health care system, from the s referring physician. In the emergency department, triage is a formal process that resu their subsequent management. Many CDRs are initiated at triage, leading to the maxi

Unpacking principle: failure to elicit all relevant information (unpacking) in establishing being missed. The more specific a description of an illness that is received, the more li their history-giving, or physicians otherwise limit their history-taking, unspecified pos

Vertical line failure: routine, repetitive tasks often lead to *thinking in silos*—predictable, Though often rewarded, the approach carries the inherent penalty of inflexibility. In cont the unexpected, rare, or esoteric. An effective lateral thinking strategy is simply to pose the question: "What else might this be?"

Visceral bias: the influence of affective sources of error on decision-making has been widely underestimated. Visceral arousal leads to poor decisions. *Countertransference*, both negative and positive feelings toward patients, may result in diagnoses being missed. Some attribution phenomena (*fundamental attribution error*) may have their origin in countertransference.

Yin-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 *Yin-Yang 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 may prove ultimately to be true, but to adopt the strategy at the outset is fraught with the chance of a variety of errors.

*The terms used to describe the various CDRs above are those by which they are commonly known in the psychology and medicine literature, as well as colloquially. Some, such as *feedback sanction* and *hindsight bias*, are indirect, reflecting more on processes that interfere with physician calibration. There is considerable overlap among CDRs, some being known by other synonyms. These, together with further detail and citations for the original work, are described in Croskerry P. Achieving quality in clinical decision making: cognitive strategies and detection of bias. Acad Emerg Med. 2002;9:1184–1204. The above list was based on material in that article and in an earlier work.[27]

Review > Acad Med. 2003 Aug;78(8):775-80. doi: 10.1097/00001888-200308000-00003.

The importance of cognitive errors in diagnosis and strategies to minimize them

Pat Croskerry [1]

Affiliations + expand

PMID: 12915363 DOI: 10.1097/00001888-200308000-00003

Biais cognitifs : 6 familles

- Attachement obstiné à un diagnostic
- Absence de recherche de diagnostic différentiel
- Erreur causée par les conclusions d'un autre
- Erreur dans la perception de la prévalence d'une maladie
- Erreur due aux caractéristiques du patient ou de sa présentation
- Erreur dues à la personnalité du clinicien ou à son humeur

Cas clinique

Adapté de :

Case Reports > Ann Intern Med. 2005 Jan 18;142(2):115-20.

doi: 10.7326/0003-4819-142-2-200501180-00010.

Improving patient care. The cognitive psychology of missed diagnoses

Donald A Redelmeier [1]

Affiliations + expand

PMID: 15657159 DOI: 10.7326/0003-4819-142-2-200501180-00010

Cas clinique

- Homme de 65 ans
- douleur lombaire et cervicale, douleurs musculaires diffuses et sensation subjective de fièvre
- examen clinique banal hormis un érythème pharyngé, le dos n'est pas examiné
- diagnostic de pharyngite qs après frottis de gorge et hémocultures
- r/ Ibuprofène

Biais de disponibilité

- Évaluer la prévalence d'une condition à l'aune de son expérience personnelle et de l'aisance à se la remémorer.
- i.e. attribuer les myalgies et la douleur dorsale à une virémie (condition souvent rencontrée).

Cas clinique : suite

- L'on rappelle le patient car ses hémocultures sont positives pour un MSSA
- ATCD : maladie de Hodgkins de stade IIA en RC et lichen plan sévère avec compliance aléatoire
- Complément anamnèse : accroissement du prurit

Biais d'ancrage

- Rester fidèle envers et contre tout à ses premières impressions fermement établies
- i.e. penser par exemple (cela n'a pas été le cas ici) que l' hémoculture positive est secondaire à une contamination et rester sur le diagnostic de virose

Cas clinique : suite

- 17/9, 88', 36,9°
- faciès vultueux
- B1B2 rns, MV symétrique, ASTI, examen neurologique banal
- Nuque souple, dos sp
- Lésions lichénoïdes excoriées des jambes

Cas clinique : suite

- Biologie sanguine: sp hormis syndrome inflammatoire modéré
- Urines : 10 GR au rusu, reste sp
- Rx thorax : sp
- Rx colonne cervicale et lombaire : remaniement dégénératifs, PLOT

Biais de cadrage

- Si l'on évoque une homme de 65 ans avec syndrome grippal et examen clinique banal dont une hémoc est revenue positive pour un MSSA on est tenté de croire à une contamination
- Si l'on parle d'un homme de 65 ans en rémission d'un LH avec douleur rachidienne, fièvre et hémocultures positives, on ouvre le champ.

Cas clinique : suite

- Hospitalisation et antibiothérapie empirique par vancomycine puis par flucloxacilline
- j2 nouveau souffle cardiaque —> USTT : (-)
- Amélioration clinique et patient qs avec flucloxacilline per os
- diagnostic : bactériémie à MSSA sur porte d'entrée cutanée
- QS avec consultation de follow-up programmée

Cas clinique : suite

- Consultation de follow-up : après une amélioration initiale, récidive des plaintes avec douleur nuque et dos, asthénie
- Apparition de paresthésies des mains et d' hématurie.
  Pas d'hospitalisation mais hémocs réalisées

Cas clinique : suite

- Une hémoculture revient positive pour un mssa --> patient convoqué (encore)
- RMN : ostéomyélite c6-c7 avec abcès épidural
- ETO : refusée par le patient
- R/ céphalosporine 1g iv 6 semaines avec suivi clinique correct

Biais de fermeture prématurée

- Aversion à poursuivre d'autres hypothèses une fois qu'une conclusion à été retenue.
- Survient plus fréquemment (et paradoxalement) lorsque les options sont nombreuses.
- Ici, l'hypothèse d'une endocardite avec greffes infectieuses à été abandonnée bien vite. L'hématurie n'a pas été explorée ...

Biais d'obédience aveugle

- Non remise en question de l'avis d'une autorité (collègue ou examen technique)
- Ici non remise en question de l' us cœur (-) et d'une rx (-) alors que ces examens sont notoirement peu sensibles pour le diagnostic évoqué.

Des solutions ?

- Métacognition
- Mise à disposition de béquilles cognitives (ressource documentaires adaptées aisément disponibles)
- Être conscient de nos faiblesses et organiser des follow-up !!
- Il n'existe pas d'études prouvant l'efficacité de ces techniques de "debiasing" …

Sources et références

1. Croskerry P. The importance of cognitive errors in diagnosis and strategies to minimize them. Acad Med J Assoc Am Med Coll. août 2003;78(8):775-80.
2. Shojania KG, Burton EC, McDonald KM, Goldman L. Changes in rates of autopsy-detected diagnostic errors over time: a systematic review. JAMA. 4 juin 2003;289(21):2849-56.
3. Graber ML, Franklin N, Gordon R. Diagnostic error in internal medicine. Arch Intern Med. 11 juill 2005;165(13):1493-9.
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5. Van Den Berge K, Mamede S. Cognitive diagnostic error in internal medicine. Eur J Intern Med. sept 2013;24(6):525-9.

We link Care

Take home message

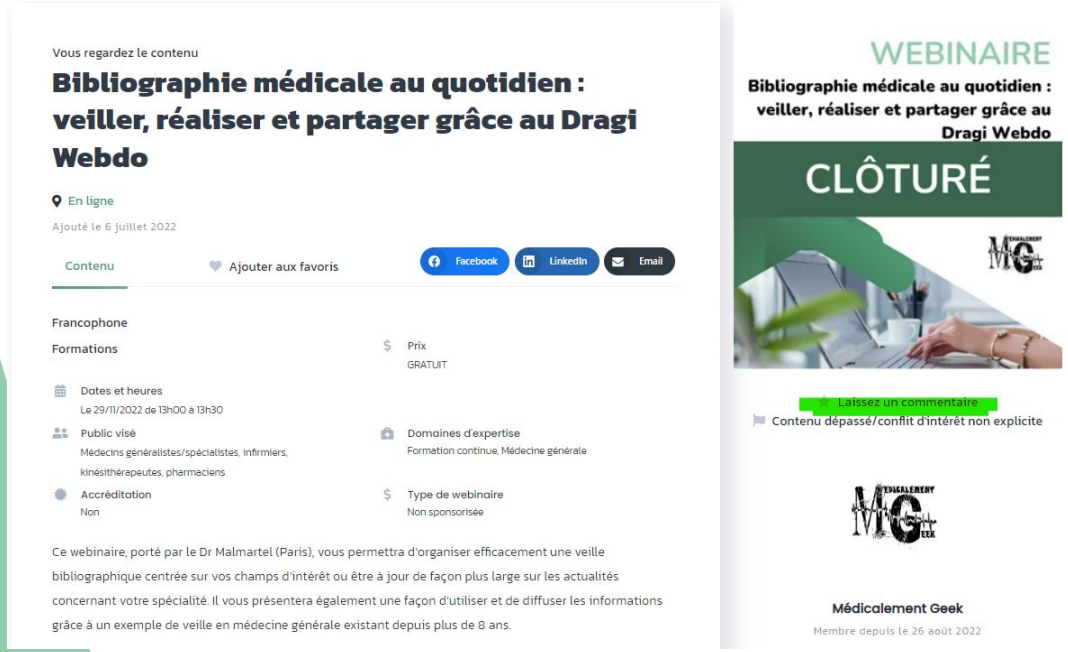
Nous avons tous la tendance naturelle de rester full intuitifs pendant notre démarche diagnostique (système 1) c'est un chemin confortable mais il est miné !

En être conscient (métacognition) est (très probablement) un premier pas vers une meilleure qualité de prise en charge.

Insérer votre LOGO

EVALUATION

Barre de menu >> webinaire >> laissez un commentaire



Insérer votre LOGO

REPLAY

1/ Couper l'enregistrement

2/ Répondre les questions du chat (en bas à droite)