

**“SPIDEY-SENSE” AND THE WEB OF
MEDICAL EDUCATION:
INTERTWINING METACOGNITION,
INTUITION AND THE ART OF MEDICINE**

FACULTY DEVELOPMENT
JEKYLL ISLAND
JUNE 3RD, 2017



BILLY G CHACKO



Disclosures

- Google image search

Goal

- Attendees will recognize new paradigms for learning and teaching in practice

Objectives

At the end of this session you will be able to:

- Outline the history of medical education
- Describe the relationship between metacognition and intuition
- Discuss new techniques in mapping intuition

A busy day at the clinic

62 year old uninsured female smoker with HTN, DM2, hyperlipidemia, COPD returns without her medication (list) after missing several appointments.

CC: Weakness, fatigue, knee hurts, leg swelling, L shoulder hurts and ran out of oxygen.

Medical student A:

Medical student B:

...another busy day at the clinic

NEW INFORMATION

+

PRIOR KNOWLEDGE

+

LIMITED TIME

=

STRESS

+

SAVING A LIFE?

+

UNCERTAINTY (when the clinical scenario and any of the above are incongruent)



THE DOCTOR
Sir Luke Fildes 1891

**MEDICAL EDUCATION
IN THE
UNITED STATES AND CANADA**

**A REPORT TO
THE CARNEGIE FOUNDATION
FOR THE ADVANCEMENT OF TEACHING**

**BY
ABRAHAM FLEXNER**

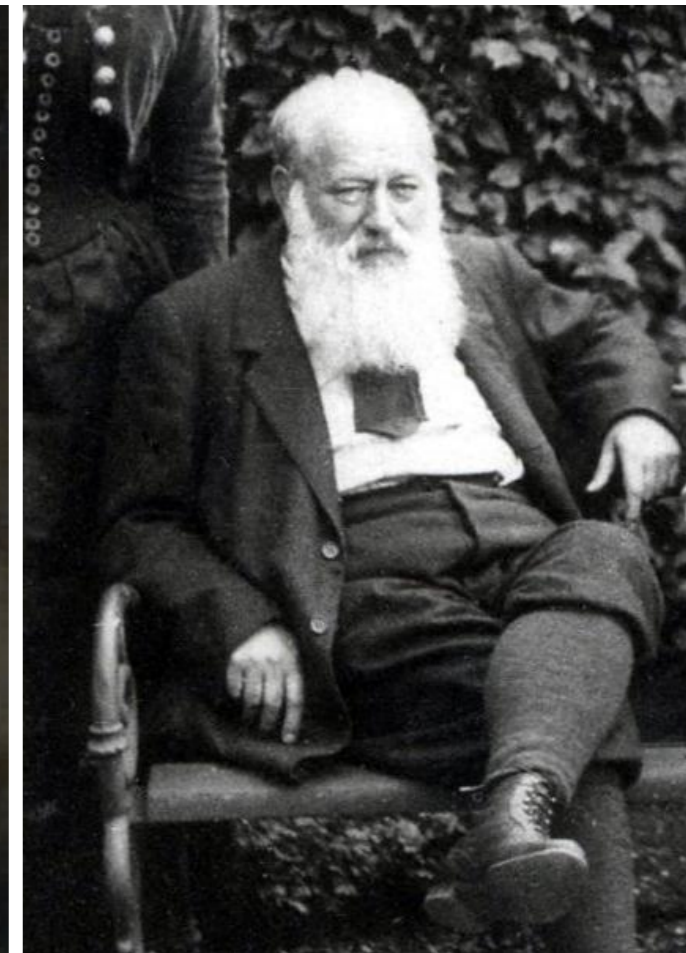
**WITH AN INTRODUCTION BY
HENRY S. PRITCHETT
PRESIDENT OF THE FOUNDATION**

BULLETIN NUMBER FOUR (1910)
(Reproduced in 1960)
(Reproduced in 1972)

**437 MADISON AVENUE
NEW YORK CITY 10022**



Abraham Flexner



Theodor Billroth



1920s National Library of Medicine

HISTORICAL PERSPECTIVES IN MEDICAL EDUCATION

The Flexner Report — 100 Years Later

Thomas P. Duffy, MD

Yale School of Medicine, New Haven, Connecticut

The Flexner Report of 1910 transformed the nature and process of medical education in America with a resulting elimination of proprietary schools and the establishment of the bio-medical model as the gold standard of medical training. This transformation occurred in the aftermath of the report, which embraced scientific knowledge and its advancement as the defining ethos of a modern physician. Such an orientation had its origins in the enchantment with German medical education that was spurred by the exposure of American educators and physicians at the turn of the century to the university medical schools of Europe.

American medicine profited immeasurably from the scientific advances that this system allowed, but the hyper-rational system of German science created an imbalance in the art and science of medicine. A catching-up is under way to realign the professional commitment of the physician with a revision of medical education to achieve that purpose.

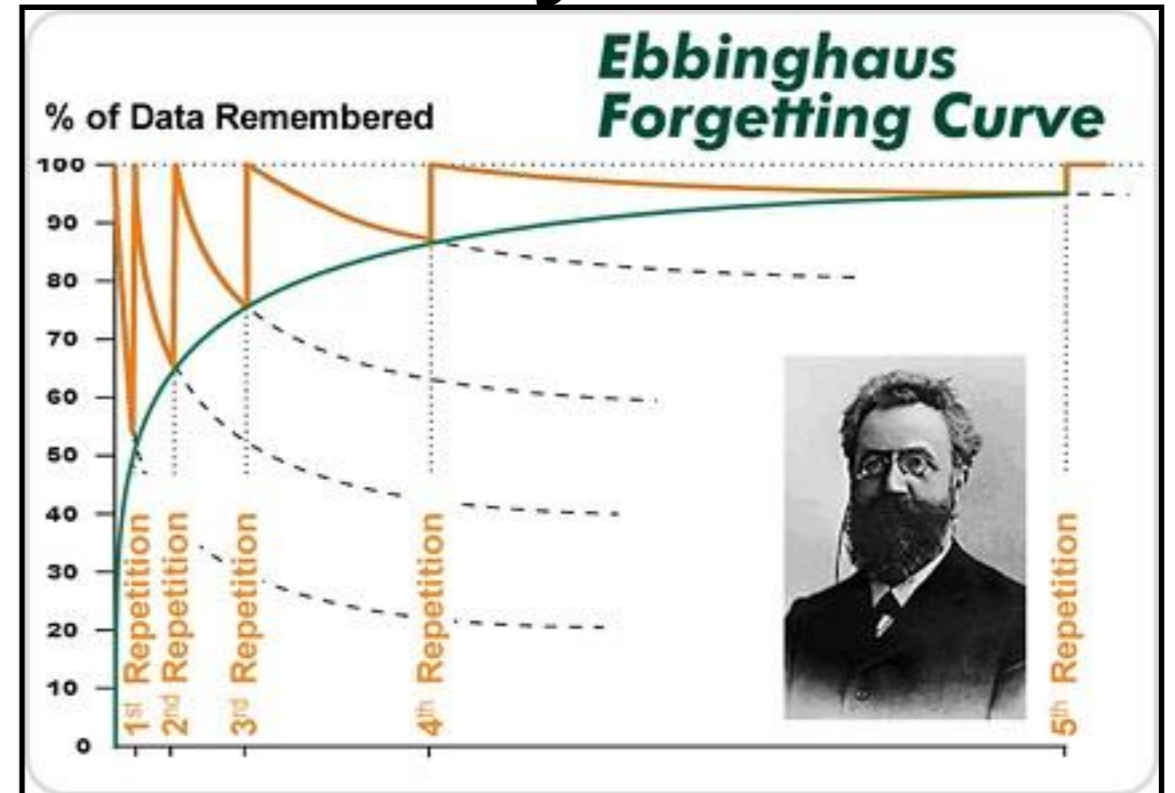
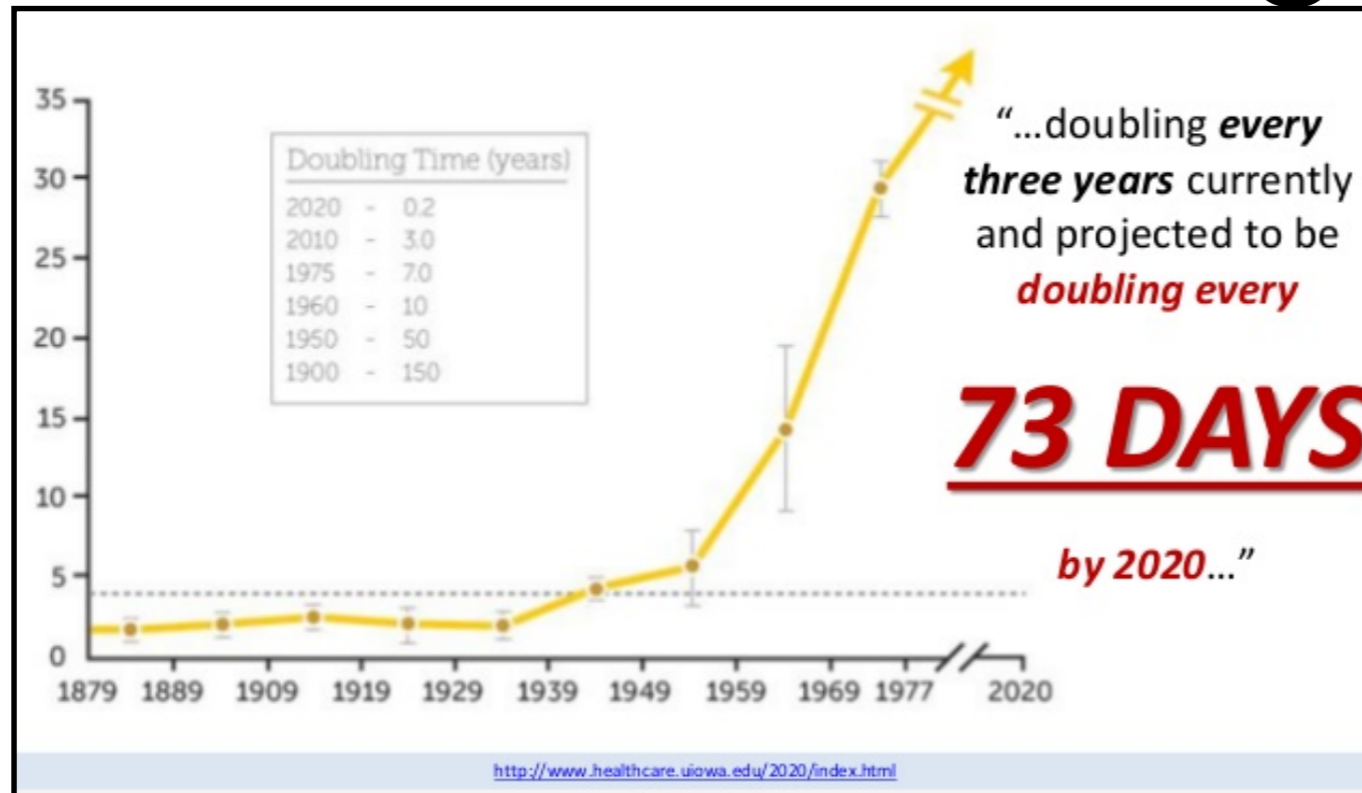


2017 Internal Medicine Residency

THE i-PATIENT

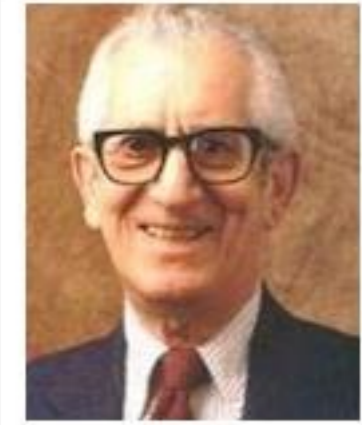
Abraham Verghese, Stanford.

Medical Knowledge and Knowledge Decay



Discount : All past and current knowledge still accurate?
Memory techniques?
Repetition?

own knowns and known unknowns decay, how about unknown knowns



Benjamin S. Bloom

HOW DID WE GET HERE? PEDAGOGY!

Taxonomy: Remember, Understand, Apply, Analyze, Evaluate, Create

Cognitive process: Lower to Higher order thinking

Knowledge dimension: Concrete to Abstract knowledge

Knowledge : Factual, Conceptual, Procedural, Metacognitive*

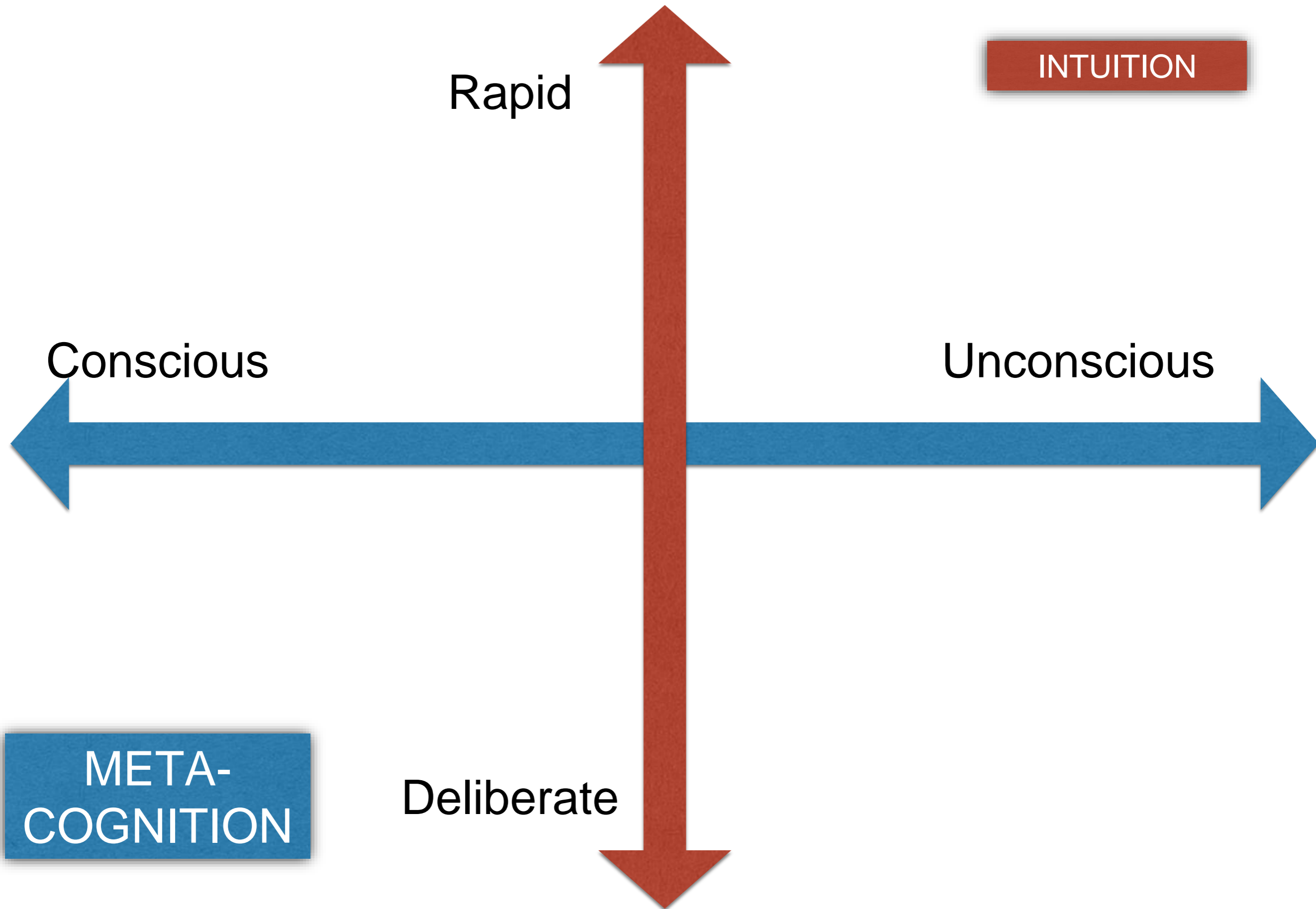
Cognitive progression: Birth to Adulthood

Cognition: Sensorimotor, Preoperational, Concrete operational, Formal operations



Jean Piaget

LEARNING THEORIES	
Behavioral	New behaviors or changes are acquired by associating stimulus and response.
Cognitive	Learning due to internal processing of information
Constructive	Construct our knowledge and make sense of the world based on individual experiences



METACOGNITION

‘THINKING ABOUT THINKING’

‘KNOWING ABOUT KNOWING’

‘BEHAVING ABOUT BEHAVING’

Deliberate thinking: Plan, monitor and evaluate

Deliberate reflection: Account, Questions

Perspective taking: Patient, Peer, Preceptor

Realms of application

Pre-visit

Clinical problem solving

Communication/Relationship

Professionalism

Teaching

Self-directed learning

GOALS

BELIEFS

MOTIVATION

Rules of Thumb

Occam's Razor : The simplest solution to a clinical problem tends to be correct

Availability: Last clinical experience will guide next experience

Representativeness: Similarities among clinical events

Sutton's Law : 'Obvious' diagnoses tends to explain symptoms more than 'non-obvious'

NOT ALWAYS CORRECT!

Biases

Posterior probability -- decision about this patient is unduly influenced by what we know about other patients

Sutton's slip -- dx possibilities other than the obvious are not given enough consideration

Anchoring -- tendency to 'lock on' to salient features in the initial presentation

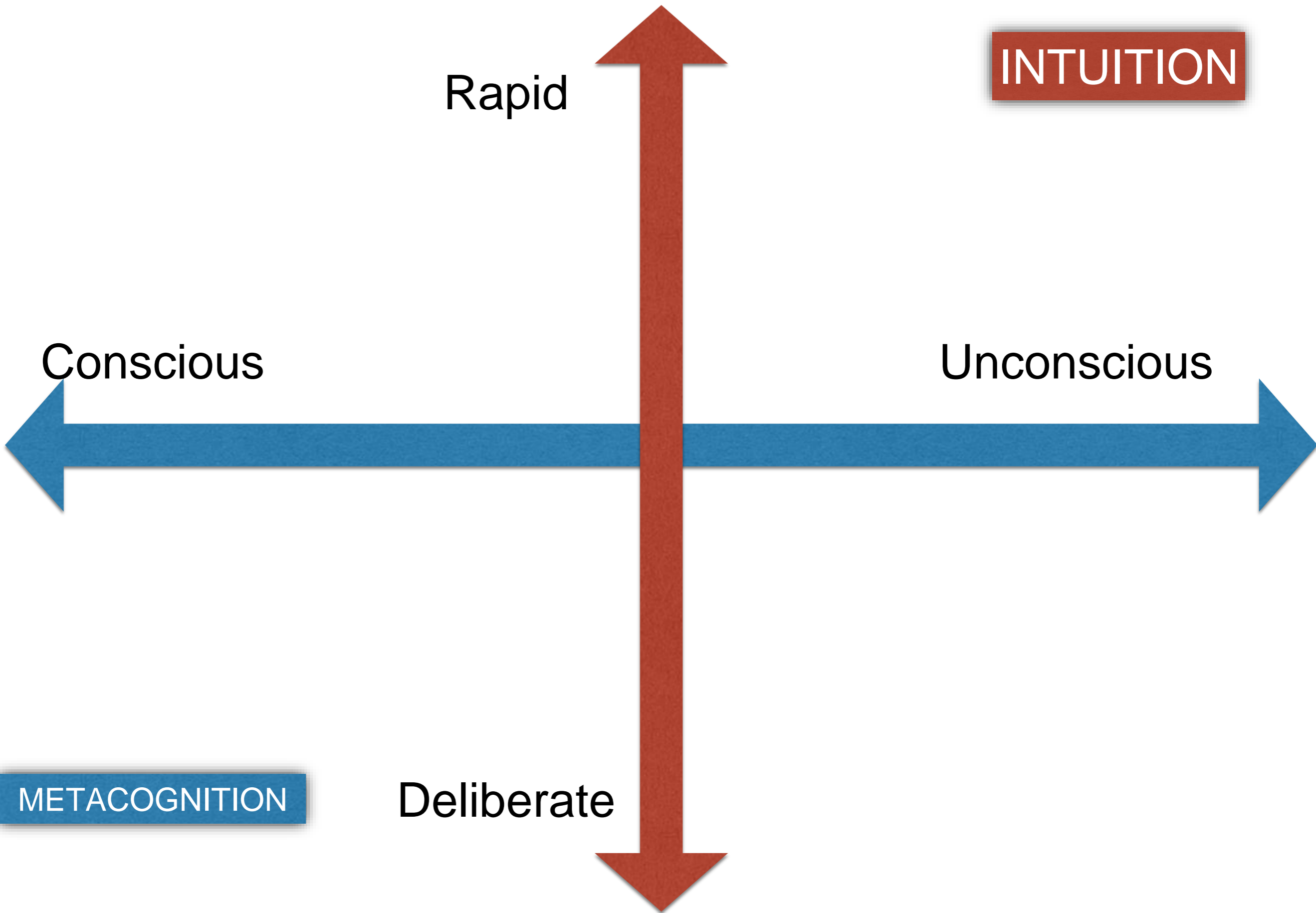
A busy day at the clinic

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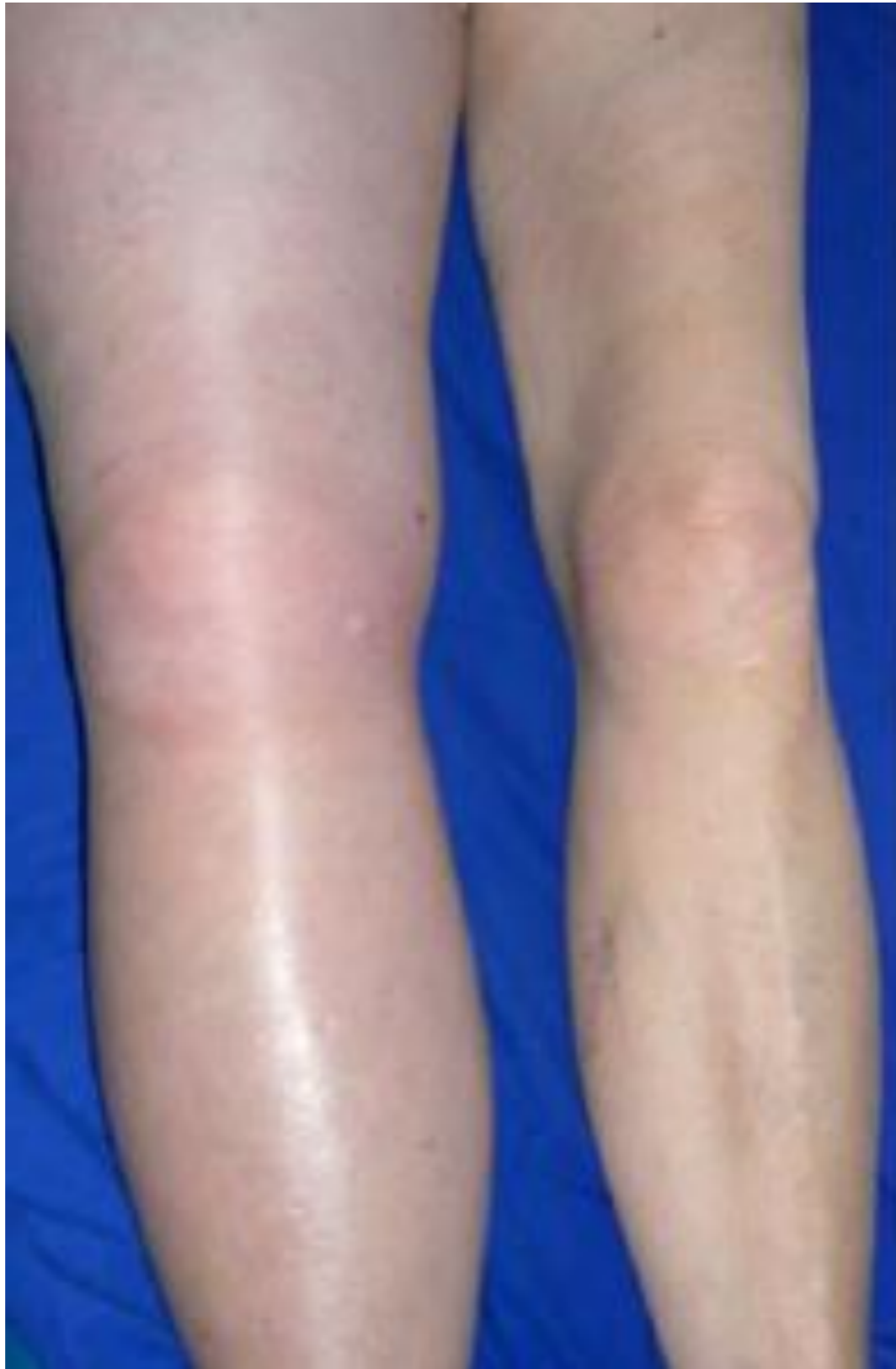
CC: Weakness, fatigue, knee hurts, leg swelling, L shoulder hurts and ran out of oxygen.

Medical student A:

Medical student B:



What is your diagnosis?
QUICKLY!!



DVT

Postthrombotic syndrome

Lymphedema

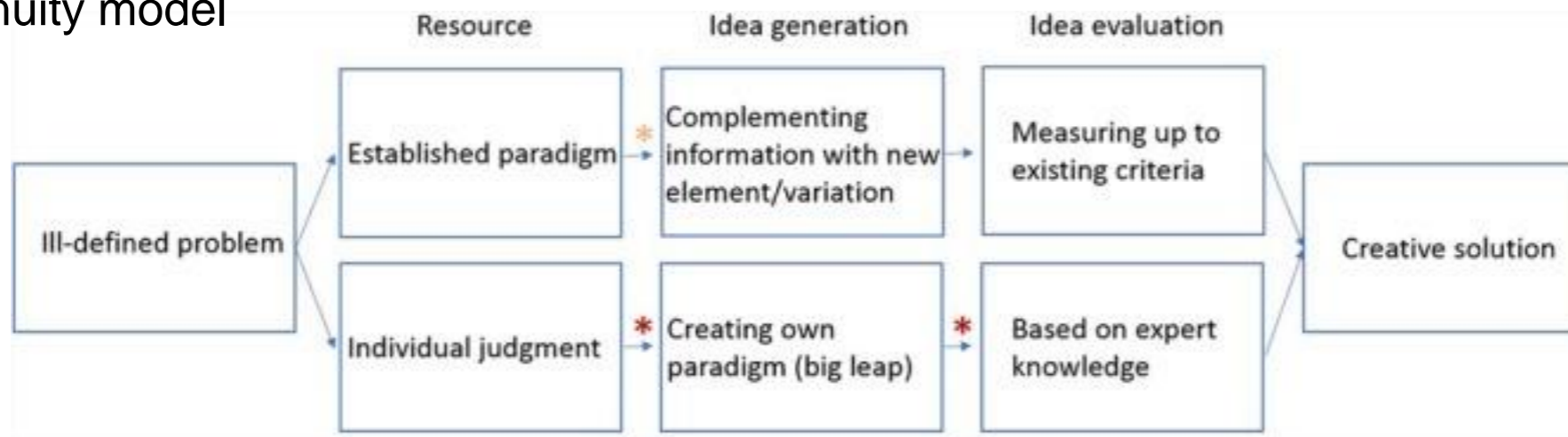
May-Thurner syndrome

Medical Intuition

- Awareness of solution without having to perceive it.
- Routine care of patients
- Complex clinical situations without EBM*
- Advanced pattern recognition skills (search superiority)

Conceptual frame work of intuition in problem solving

Continuity model



Discontinuity model

Impasse/Insight = Aha! moment.

Brain and Behavior. 2016;6(1):e00420. doi:10.1002/brb3.420.

Crandall & Getchell-Reiter, 1999

Meadow, et al 2002

Norman, et al 1992

Wood, et al 2013

INTUITION: A NEURAL BASIS

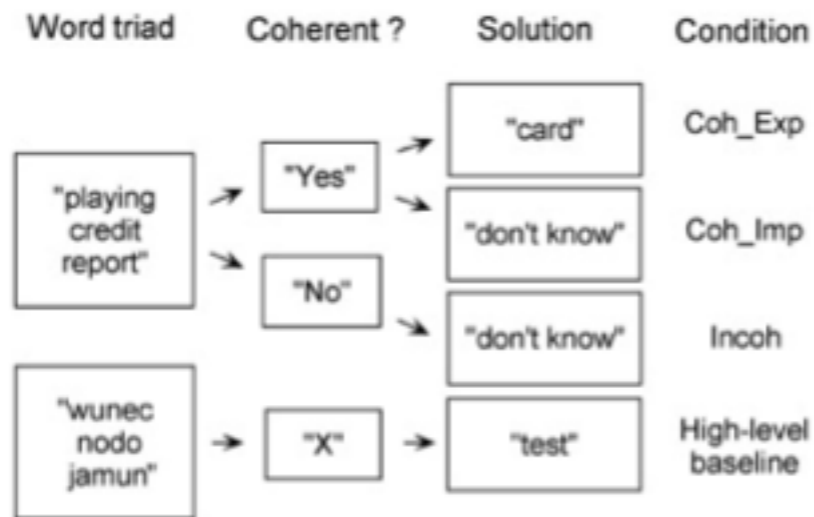
Coherence judgement task

SALT
DEEP
SPRAY

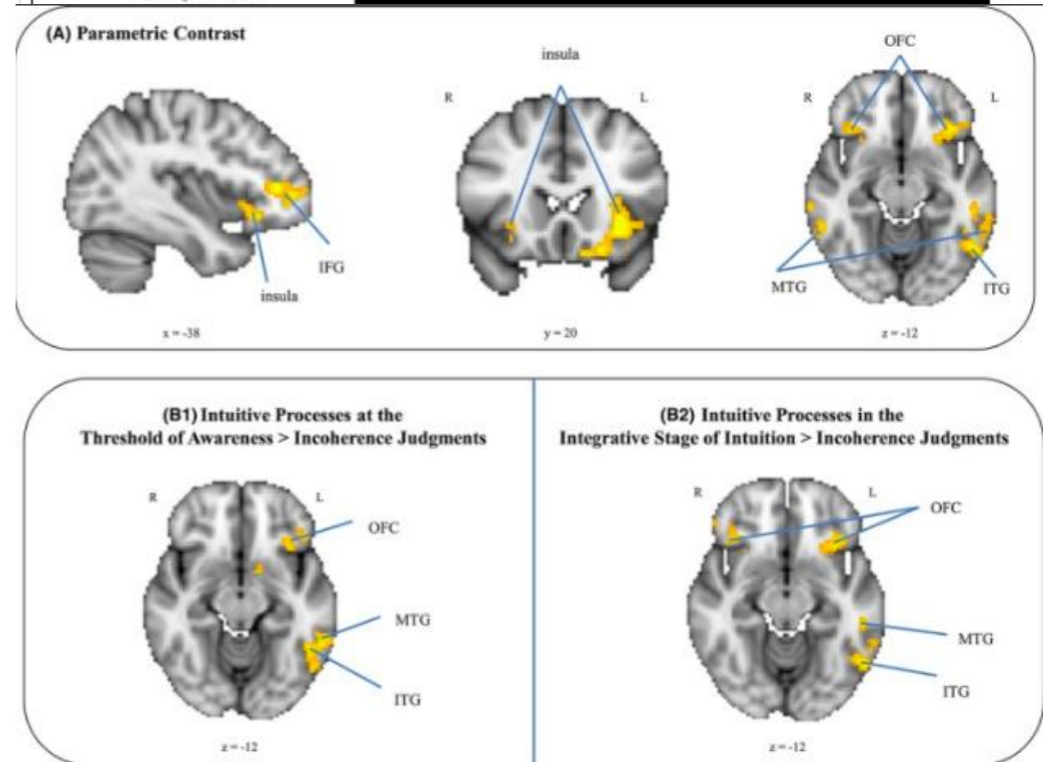
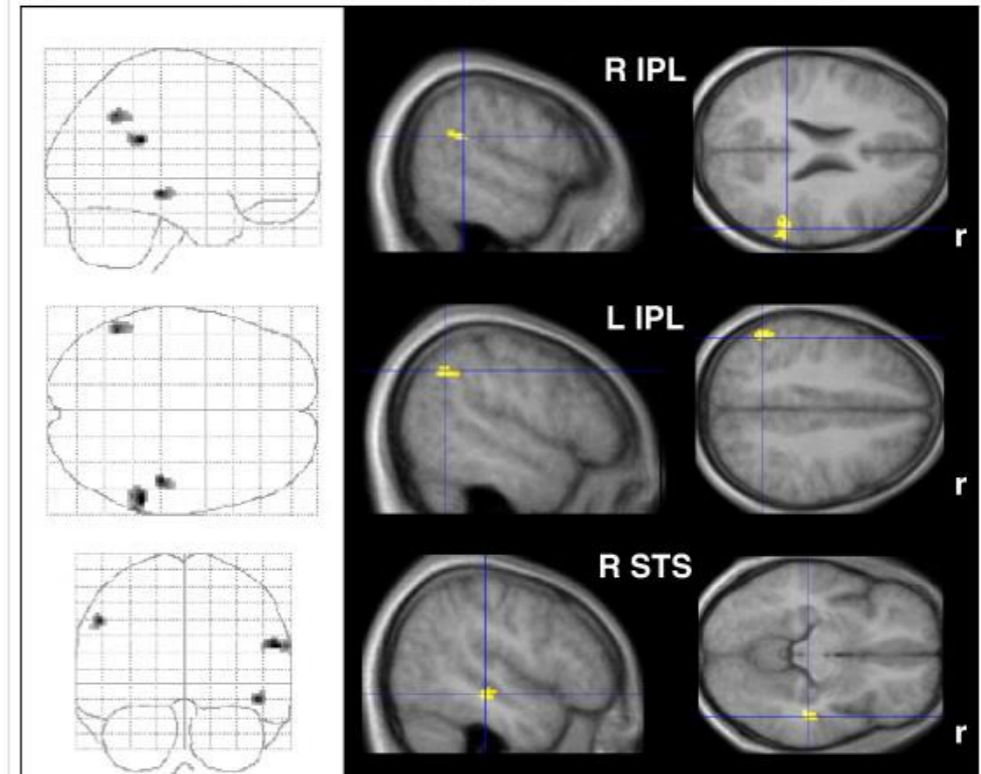
SILK
STONE
GOAT

SEA

15 subjects: Right-handed male, German
50 coherent, 30 incoherent triads



c) Intuitive vs. explicit coherence judgments [Coh_Imp > Coh_Exp]



Intuitive to explicit judgments are associated with increased neural activity in heteromodal association areas in bilateral inferior parietal and right superior temporal cortex.

Improving patient centeredness

Recognize scientific hazards

[Contradicted and initially stronger effects in highly cited clinical research.](#)

Ioannidis JP.

JAMA. 2005 Jul 13;294(2):218-28.

[Replication and contradiction of highly cited research papers in psychiatry: 10-year follow-up.](#)

Tajika A, Ogawa Y, Takeshima N, Hayasaka Y, Furukawa TA.

Br J Psychiatry. 2015 Oct;207(4):357-62. doi: 10.1192/bjp.bp.113.143701. Epub 2015 Jul 9.

[Persistence of contradicted claims in the literature.](#)

Tatsioni A, Bonitsis NG, Ioannidis JP.

JAMA. 2007 Dec 5;298(21):2517-26.

Replication rate <50%

1/4 unchallenged

Contradicting results

Magnitude of effect

Persistent citation

Changes in publication process

[Logging The BMJ's "patient journey".](#)

Richards T, Snow R, Schroter S.

BMJ. 2015 Aug 17;351:h4396. doi: 10.1136/bmj.h4396.

[Characteristics of qualitative studies in influential journals of general medicine: a critical review.](#)

Yamazaki H, Slingsby BT, Takahashi M, Hayashi Y, Sugimori H, Nakayama T.

Biosci Trends. 2009 Dec;3(6):202-9. Review.

Tackling 'corruption in the mission of healthcare'

Promote patient partnership

Patient reviewers

Annals, NEJM, BMJ, JAMA, Lancet '00 - '04

Only 80 qualitative studies. >90% in BMJ



www.executivecoachny.com

43 years of experience comes down to 208 seconds

“SPIDEY-SENSE”



More than a Feeling: ONR Investigates ‘Spidey Sense’ for Sailors and Marines. 2014.

“The intuitive mind is a sacred gift and the
rational mind a faithful servant.
We have created a society that honors the
servant and has forgotten the gift.”

–Albert Einstein