

Expertise by Design

Why adaptive expertise no longer forms on its own

● Dan Saddawi-Konefka · Keith Baker

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What it is, and why it matters

5 minutes • Dan

Two kinds of expertise

Routine expertise

Speed, accuracy, and efficiency on familiar problems.

It is most of practice.

Adaptive expertise

Reasoning about why things work based on deep conceptual understanding, so that when a case matches nothing you have seen, you can build an approach that holds up.

Why adaptive expertise matters

1

When the protocol fails.

Unforeseen moments where the patient needs a person to intervene and change a clinical course, not just follow a pathway.

2

Someone has to advance the field.

Every guideline, and the evidence underneath it, was written by people reasoning past the guideline they had.

Polio before the ICU

In Copenhagen in 1952, polio patients who could not breathe were dying at a rate of 87 percent, and there were no ventilators in the country. Bjørn Ibsen, an anesthesiologist, reasoned that they were dying of CO₂ retention, and tried tracheostomy with hand ventilation. Medical and dental students bagged patients around the clock, and deaths fell by more than half. From that came the ICU, modern ventilators, and the blood gas. None of it would have happened with routine expertise alone.

GLP-1 Receptor Agonists

Three or four years ago, patients started arriving for elective surgery on semaglutide. They had followed every fasting rule – was that enough? There was no guideline, because the problem was new. The guidance we currently have is from reasoning from gastric physiology and a handful of case series.

The conditions for adaptive expertise...
And how we have lost ground on them...

- **Because of other *really positive advancements*.**

10 minutes • Dan

1

Cognitive architecture

Effortful encoding to develop schema.

Pushed aside by

Cognitive aids at the point of care.

Decision support arrives before the resident works the answer out for themselves. Only working it out builds a durable and appropriate understanding.

Deep conceptual understanding does not arise from cognitive aids.

2

Reflective practice

Continuity plus feedback and opportunity to reflect.

Pushed aside by

**Our care about
psychological
safety.**

It has made faculty
hesitate to say the
developmental thing.
Reflection needs an
outside read on what
happened, and softened
feedback leaves nothing to
reflect against.

3

Deliberate practice

Work at the edge of competence with feedback in the moment.

Pushed aside by

**Efficiency and
throughput.**

Teaching takes longer, and the fastest way through the day is for the attending to do the hard part. There is little reason to learn a new way when the old way is good enough and fast.

4

Epistemic humility

Comfort with uncertainty and working the gray areas.

Pushed aside by

Question banks.

Everything has a right answer on file, which teaches residents that uncertainty is a failure rather than a normal condition.



The next 45 minutes

15 minutes

**The balance, and how
you weigh the tradeoffs**

30 minutes

**Modeling uncertainty
and unpacking your
reasoning**

How you weigh the tradeoffs

And what are you actually trading?

15 minutes · Keith

Pick two lines and argue them with a partner, then we will discuss with the group.

Pick two. Eight minutes with a partner.

- 1 Giving hard feedback vs. making residents feel good
- 2 Letting the resident struggle vs. patient safety
- 3 Challenging residents vs. getting high teaching scores
- 4 Teaching this case well vs. the board running on time
- 5 Resident autonomy vs. my own comfort and liability
- 6 Supervising real autonomy vs. how depleted I am today
- 7 Who gets the high-value case vs. who is easiest to trust

What do you think you are trading, and what might you *actually* be trading?

What did you find?

1

What do you think you are trading, what might you actually be trading, and how do you manage that balance?

2

When is this really a false choice? Are the two things always mutually exclusive?

Modeling uncertainty and unpacking your reasoning

30 minutes · Keith

An example of working through the gray zone

Patient: 79 y.o. man, 68 kg. Two weeks of confusion, headache, unsteady gait after a fall.

CT: 18 mm left chronic subdural, 6 mm midline shift. Burr-hole evacuation posted for 2 p.m.

Anticoagulation: Apixaban 5 mg BID for AF. Last dose 8 a.m. today. Creatinine 1.4.

Heart: Moderate aortic stenosis (valve area 1.2 cm^2 , gradient 28 mmHg), echo 13 months ago.

Cognition: Baseline mild cognitive impairment, now worse. Daughter at the bedside.

Now: HR ~88 irregular, BP 158/84, SpO₂ 96% on room air. Ate breakfast at 8 a.m.

It is noon. Do you proceed?

1

Not knowing something, and saying so

2

Deciding together what we would look up

3

Reasoning aloud to a shared landing point

Modeling is key.

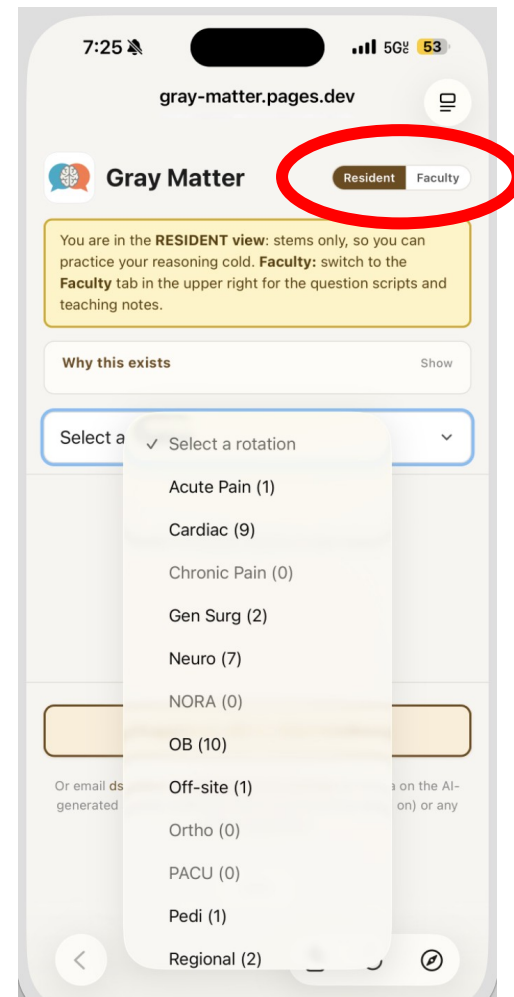
Your turn. Discuss a case.

- 1 Scan the code
- 2 One of you on Faculty, the other on Resident
- 3 Pick any case
- 4 Stop when we call time



SCAN TO OPEN

gray-matter.pages.dev/install



Willing to help us improve or build the cases?

- Would you be willing to propose a new case or provide edits on any of the existing cases?
- It's easy: We send a word doc with the stem, questions, and considerations. You mark it up and we upload the better version.
- Sign up on the end-of-day survey and tell us which rotation or cases you'd want to work on.