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Specialist Hospitals in a Changing Care Landscape

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Commissioning the Future:

Specialist Hospitals in a Changing Care Landscape

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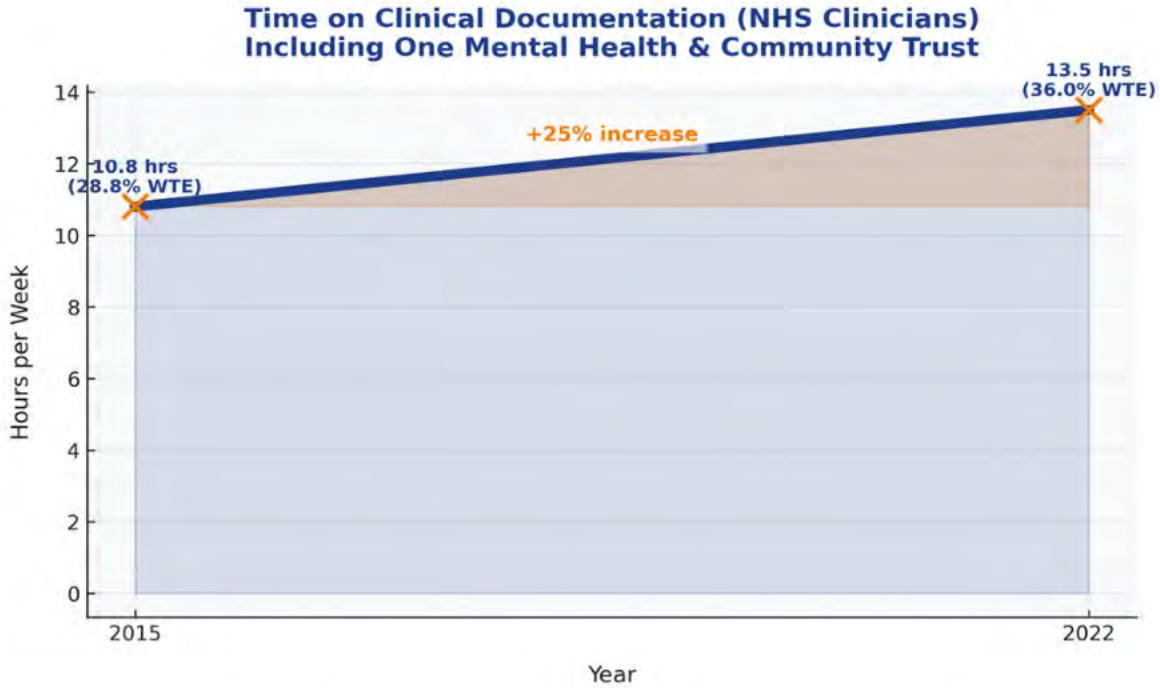
Shared Thinking and Safe Thinking

The Future Potential of AI to Enhance Quality and Safety in Complex Mental Health Care

Presented by Dr Andrew Hider
Approved Clinician, Consultant Clinical and Forensic Psychologist
Clinical Director, Iris Care Group

Starting Off

- As a clinician, I wish I could spend less time ‘working’ computers.
- Not all technology is good.
- In mental health, AI could be really helpful in getting us all off computers.
- But if we don’t design it correctly, it could add risks.
- Other clinicians who dislike computers need to be part of the conversation.
- No Mental Health AI should be approved without patient feedback.



Source: Nuance/Ignetica NHS Clinician Documentation Burden Survey (2015 & 2022). 2022: 13.5 hours/week; +25% vs 2015 (derived 10.8 hours/week).

Equivalent to 28.8% and 36.0% of a 37.5h WTE respectively.

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Why Mental Health is a Unique Case for AI

- **Objective:** To establish that applying AI in mental health is fundamentally different from its use in other areas of clinical practice.

- **Argument:** Mental health care has unique cognitive demands and very specific kinds of clinical data. This requires a purpose-built conceptual framework to ensure patient safety.

- We will explore this framework and propose a path for safe, effective human-AI collaboration in clinical decision-making, particularly in complex mental health care.

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The Nature of Our Data: The Challenge of ‘Weak Signals’

- **A core concept:** 'Weak Signals'.
- **Definition:** Subtle, disparate pieces of information distributed across vast, unstructured clinical records.
- **Examples:** A historic single risk incident of a particular kind, an emerging pattern of cancelled appointments, a concern expressed only in a single clinical episode (e.g. self-harm, risk to others).
- **The Safety Risk:** The failure to connect these individual weak signals is a primary source of patient safety incidents in complex care – post hoc investigations often uncover these missed signals.

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Potentially Safety Protective in complex mental health – accurate pattern detection to improve treatment... but only if we design it to work in the way we want it to, and design systems to 'understand' and 'assess' properly.

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The Nature of Our Reasoning: Abstract Constructs & Individualised Formulation

- Mental health clinical reasoning as taught to all disciplines relies on 'heterotopic' constructs – concepts like 'schemata', 'thoughts', 'intentions', 'beliefs'. These are not directly measurable in the same way as a physical ailment.
- Training for all disciplines stresses the core skill of constructing an idiographic (individualized) case formulation for each patient, tailoring treatment to their unique narrative and circumstances, alongside diagnostic considerations. The formulation:
  - Determines the treatment plan
  - Is used to think about risk
  - Has to make sense to the person receiving treatment as well as the clinician
  - Involves a combination of facts, theory and hypotheses about what is happening, why, and what might help
  - Is often only 'true' in retrospect (after treatment has helped)
- As complexity increases, the demands on clinicians to digest huge quantities of historical information also increases.
- **Conclusion:** A simple, protocol-driven AI is inadequate and potentially unsafe in this environment.

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The Result: An Overloaded Cognitive Space

- Large case histories and an ever-expanding evidence base increases the cognitive load in complex care. Often clinicians are faced with clinical challenges where standard guidance has been used and failed. A high risk of cognitive overload ensues. This creates risks to patient safety.

- This chart visually represents the scale of the expanding evidence base.

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The Core Safety Principle: 'Clinical Reach'

- Safe collaboration requires **'Clinical Reach'** into the AI's reasoning.
- **Definition:** The measure of a clinician's ability to have sufficient visibility, understanding, and influence over a mental health AI's cognitive processes - its reasoning, its training data, and its formulation of hypotheses.
- It is the mechanism that ensures the clinician can transparently question, validate, and guide the AI, preventing it from becoming an opaque 'black box' and ensuring human oversight is maintained.

ORIGINAL PAPERS

Clinical Reach into the Cognitive Space (CRITiCS): outline conceptual framework for safe use of generative artificial intelligence in mental health decision-making

Andrew Hider,[1] Lesa Wright,[2] Jacob Needle[1]

Bulletin 1

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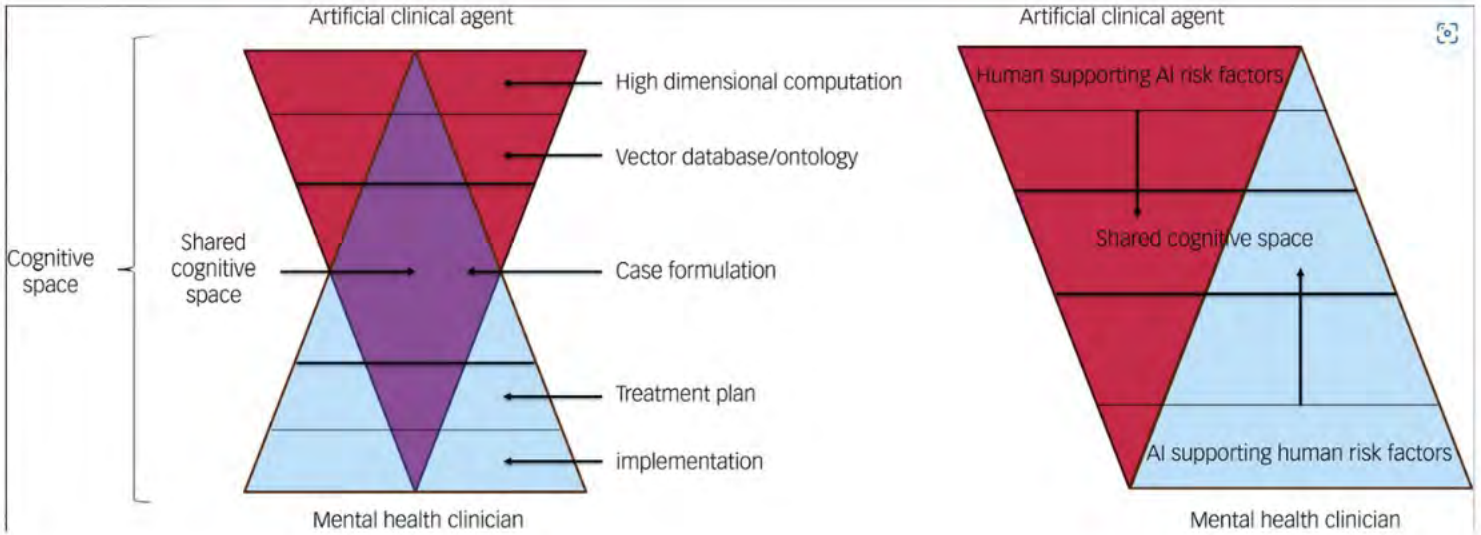
Proposing a Solution: The CRITICS Framework

- To address this, we propose the Clinical Reach Into The Cognitive Space (CRITICS) framework.

- It serves as a conceptual map for safe, effective human-AI collaboration, designed specifically for the unique demands of mental healthcare.



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The CRITICS Model Explained: The 'Shared Cognitive Space'

- The framework is built on the idea of a 'Shared Cognitive Space' where human and AI reasoning interact.
- The "agentive reach" of each partner varies depending on the task:
  - AI-heavy tasks: High-dimensional computation, scanning entire records for patterns.
  - Clinician-heavy tasks: Final judgement, empathy, and treatment implementation.
  - The extent to which the clinician maintains oversight and control can be thought of as 'Clinical Reach'.
  - Measures of clinical reach should be developed and validated to ensure safety is preserved.

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Defining Roles within the Framework

- **AI's Likely Role in Future Mental Healthcare:**
  - To act as a cognitive tool designed specifically to detect and surface potential constellations of weak signals for the clinician's review.
  - To draft and suggest initial case formulation and treatment plans.
  - To represent the evidence base and apply it to the specific details of the clinical case.

- **Clinician's Role:**
  - To exercise final judgement.
  - To use their experience of the person to validate, question, and contextualise the patterns flagged by the AI.
  - This exercises 'Clinical Reach' and mitigates **automation bias.**

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Users of Services - The Ultimate Master

- Mental healthcare has a history of excessive coercion.
- Models and frameworks are sometimes used with confidence, in the absence of adequate evidence.
- The mind is not visible, experience is not visible.

- **Another key concept in AI Mental Health – *Veridicality***
  - Mental Health – formulation and plan has to make sense and be meaningful to the person.
  - Mental health is the only area of healthcare where there are usually NO objectively verifiable markers for the condition. Our understanding is often tentative.
  - We only know if a formulation is 'true' in the rear view mirror – in so far as it was *helpful*.
  - Signal detection as a computational process does not fit this clinical process.
  - Designing systems where service users have control over sense making is critical for the safe use of AI in mental health care.

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The Urgency of a Framework

- The underlying technology is advancing at an exponential rate.
- The question is not if AI will be used in mental health, but how we will ensure it is used safely. These principles need to be developed now.
- If mental health clinicians don't get involved now, the risk is that technologists alone will be in the driving seat.

CERSI-AI

Smarter Regulation for Better Innovation in AI & Digital Health

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The True Goal: More Time to Think, More Time to Care

- The payoff of safe development of use of AI in mental health is not technological, but profoundly human.
- By safely using AI to manage the cognitive load, we can allow clinicians to move from a state of data overwhelm to one of 'Safe Thinking'.
- **The Human Dividend:** This restores the clinician's most valuable resource: time with people. Empathy, building therapeutic alliances, and the uniquely human aspects of care are what should take our time.

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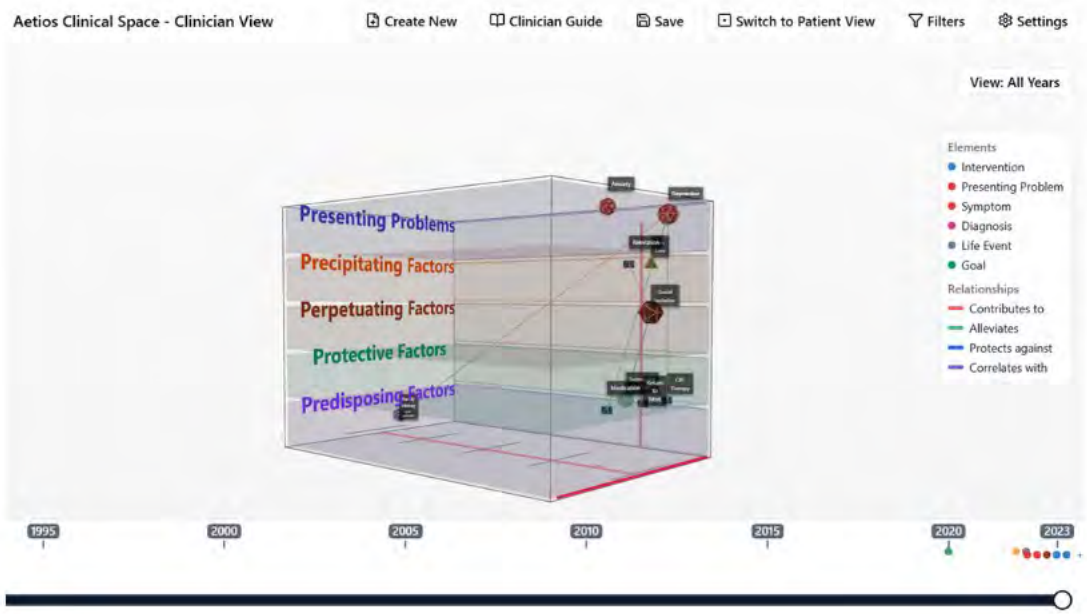
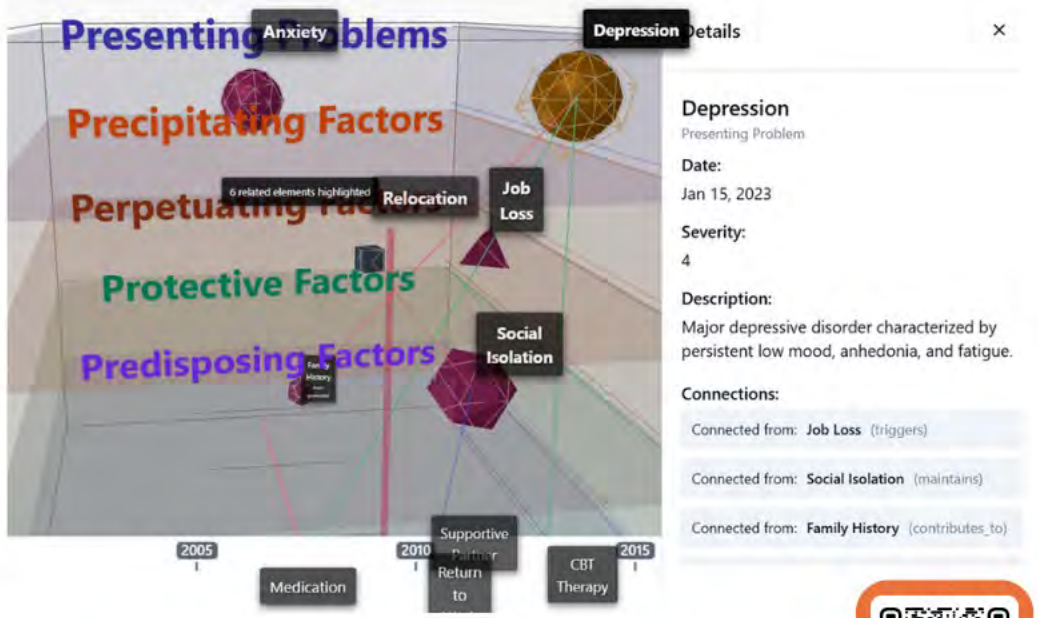
Early Work

- We have been experimenting with applications that map people's history in services and treatment into a 4D space using knowledge graphs and natural language processing using test data.
- Understanding complex case histories can only happen across time.
- At the moment we are often presented with hundreds of pages of notes.





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Summary & Next Steps

- **Recap:** The unique nature of mental health requires a specific framework to safely integrate AI. We have suggested one – Clinical Reach – but there is a very active conversation happening.
- This framework protects patient safety by focusing on 'weak signals' – where AI may be better than humans, while ensuring the clinician's 'reach' into the shared cognitive space.
- The ultimate goal is to augment, not replace, the clinician, enhancing safety and restoring the human element of care.
- Patient involvement in development should be statutory.
- A dialogue between the clinical and development communities is essential.
- Clinicians should not assume they will not understand – the concepts will become core skills in the coming years for all disciplines.

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Questions & Discussion

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