DynAIRx: Visual summaries to assist structured medication reviews

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Lightening talk

- The DynAIRx research project
- Structured Medication Reviews (SMR)
- The challenge of Electronic Health Records (EHR) visualization
- Current vendor systems (case of EMIS)
- Present design study work

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- Read the DynAIRx protocol
  - https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9761229/
- Aims:
  - "…and develop visualisations that overlay these combined data to enable easier review of medications"

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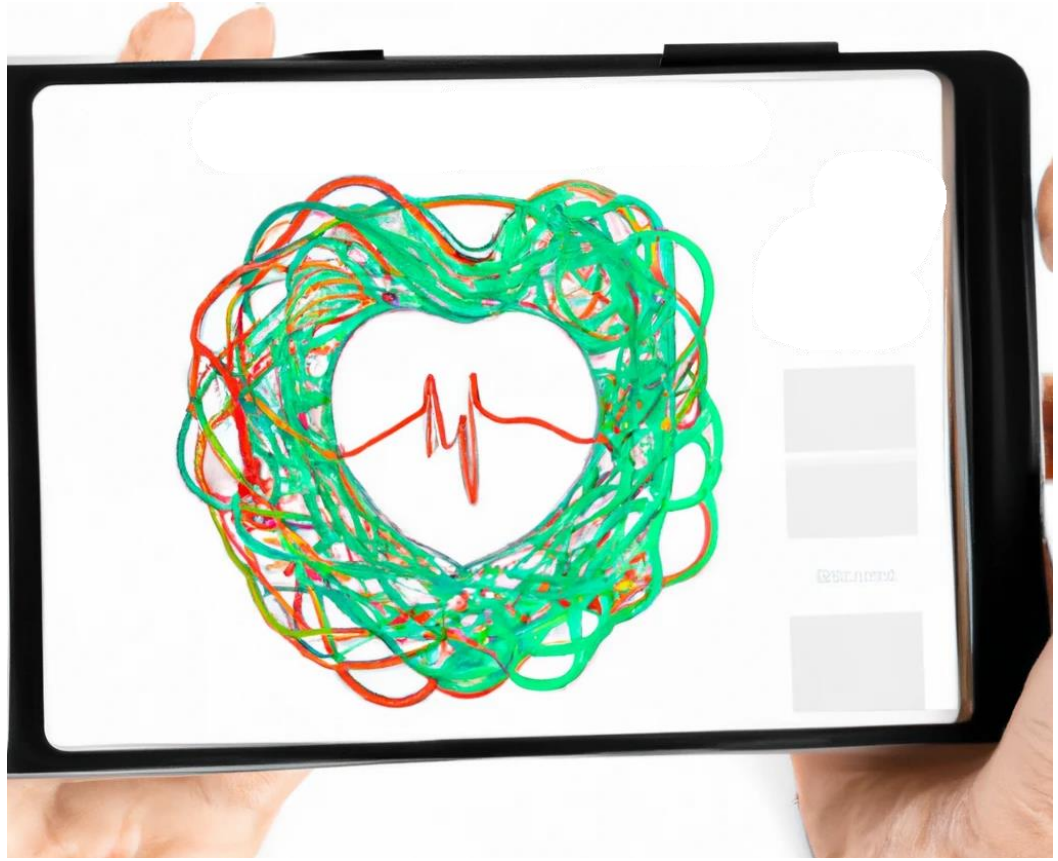
Structured Medication Reviews

- The NHS guide states: "A SMR is a structured, holistic and personalised review of an individual who is at risk of harm or medicines-related problems because of their current medicine regimen." [5]
- It also states: "From 1 October 2020, each PCN must use appropriate tools to identify and prioritise patients who would benefit from a SMR" [5]

The challenge of EHR visualization

- Navigating data protection and privacy laws
- We cannot access real or anonymized "full" records (free form text such as letters)
- Complex nature and volume of patient records [7] to visualize.
- CPRD contains:
  - conditions and diagnoses, medications, treatments, symptoms, hospital referrals and more



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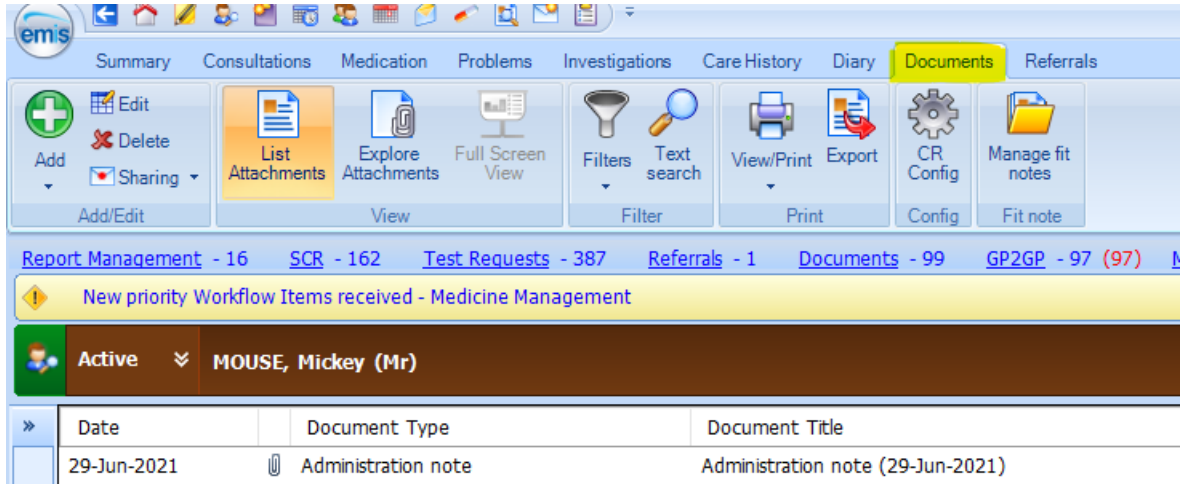
State of vendor systems (EMIS)

- List (not table) and tab-based text display.
- One of our domain experts said working with EMIS means doing "Long List Text Detective Work"
- These systems were not built with visualization in mind.



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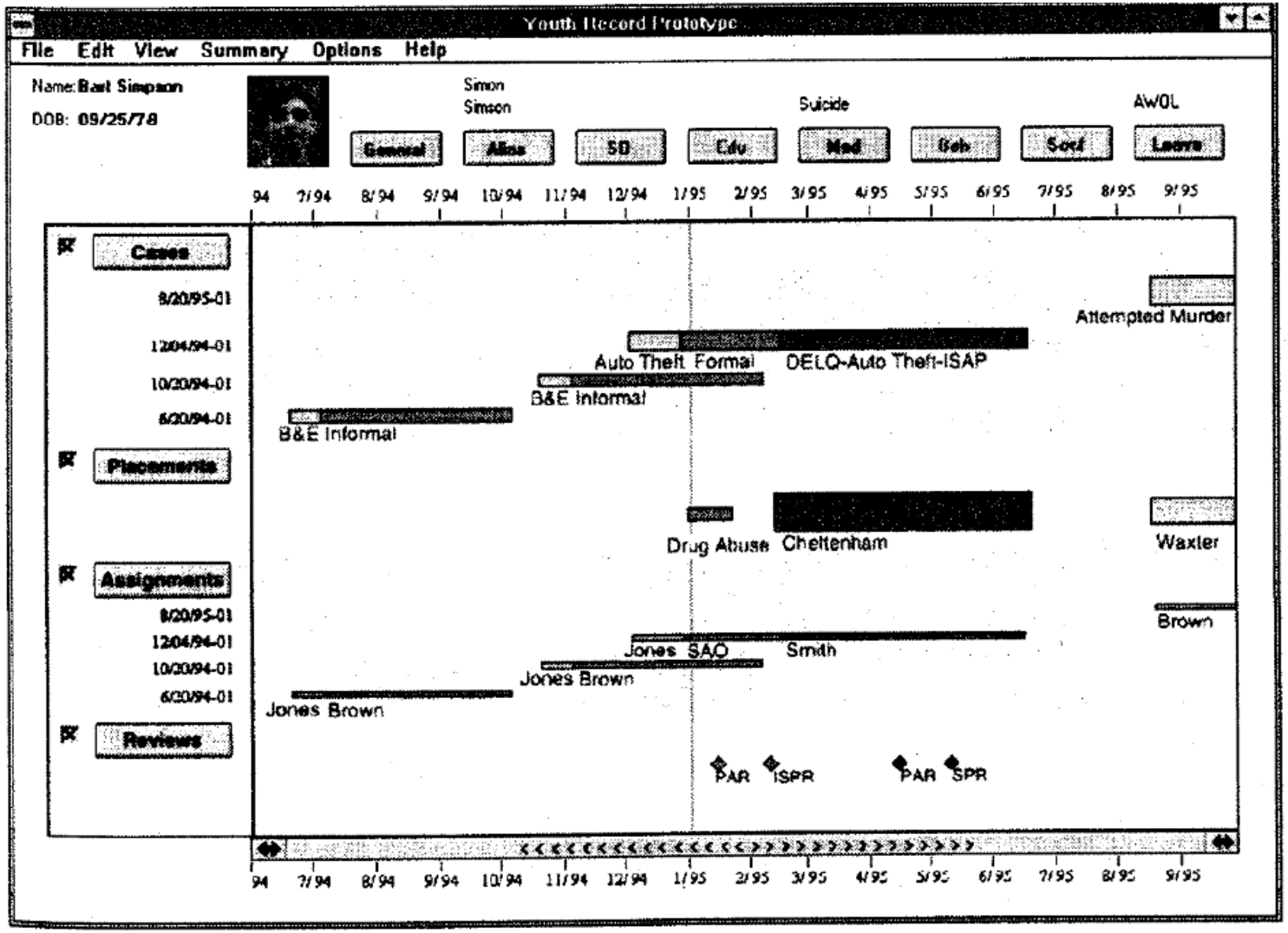
Relevant EHR visualization literature

- LifeLines [7] by Plaisant et al 1996.



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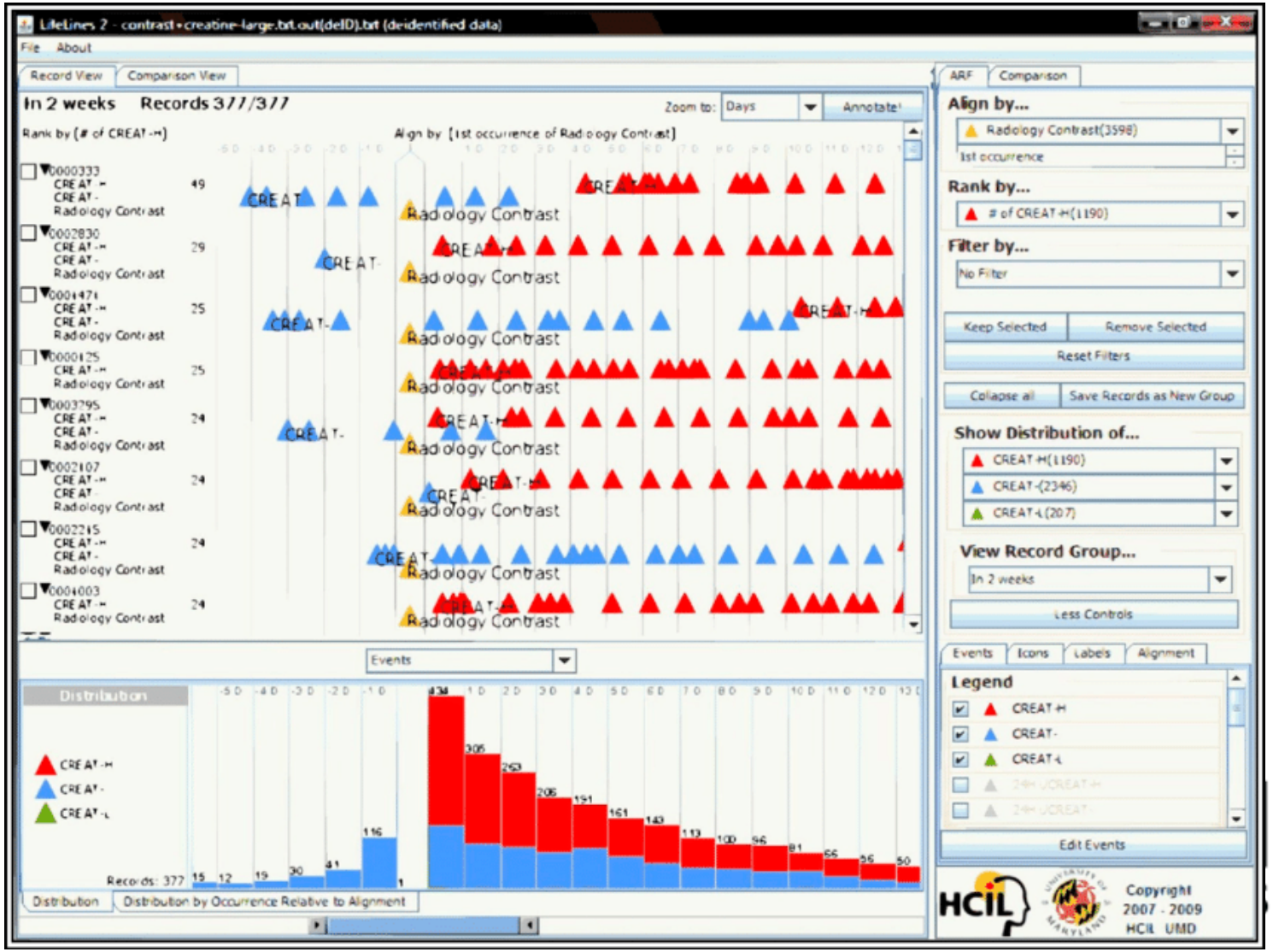
EHR visualization literature

- LifeLines2 [8]



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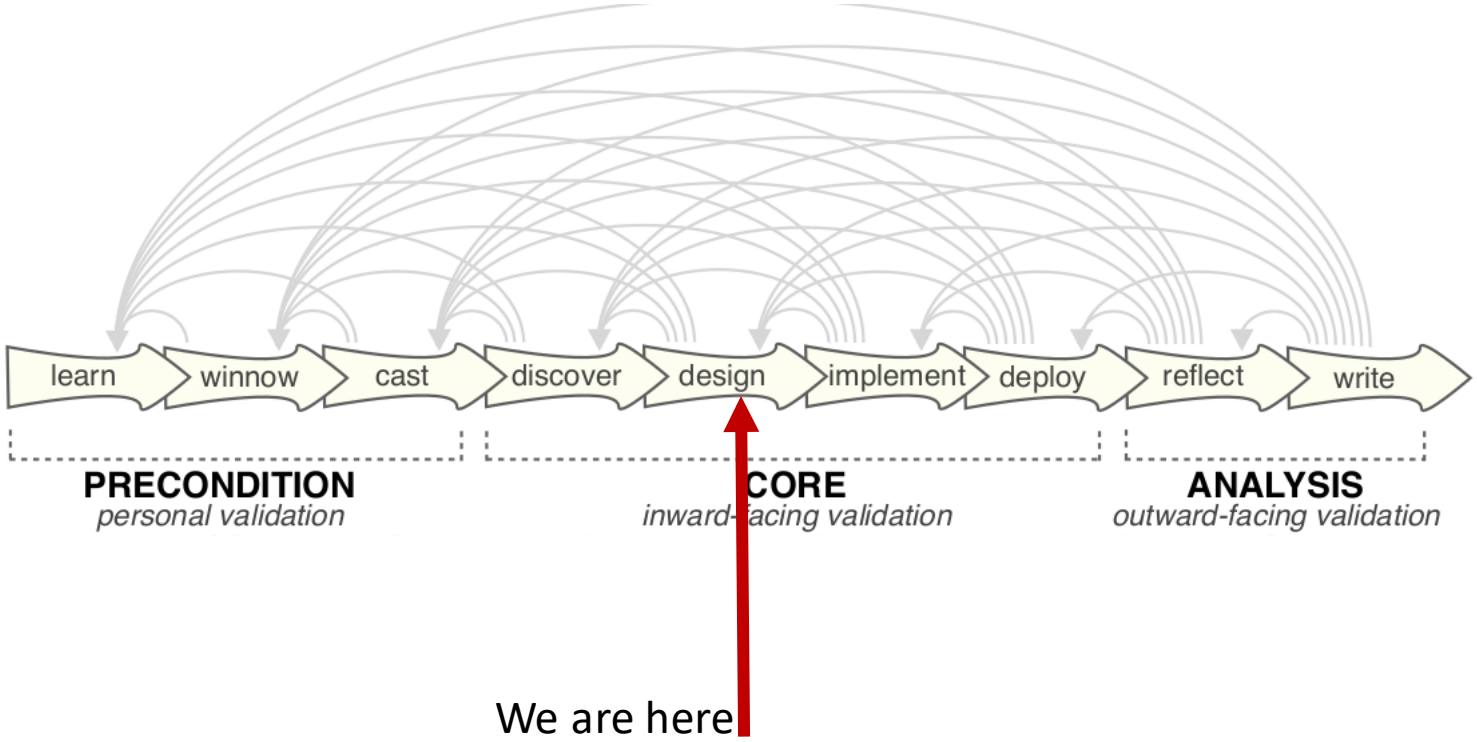
DynAIRx visualization design study

- We are following the methodology outlined by Sedlmair et al 2012 [4].
- Generating design choices.
- Working with domain experts.



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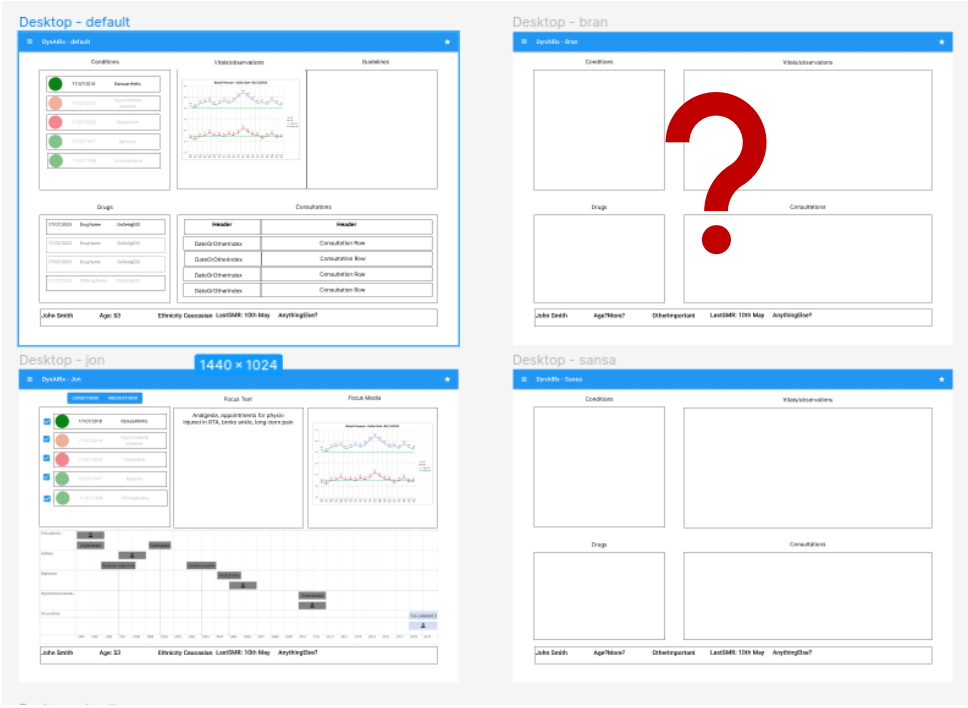
The DynAIRx design approach

- Linked views of visual summaries of required data only
- Construct a journey for condition(s), medication(s) and investigations.
- Start with the most important data then add more data
- Work with the GPs/Pharmacists to find best design choice



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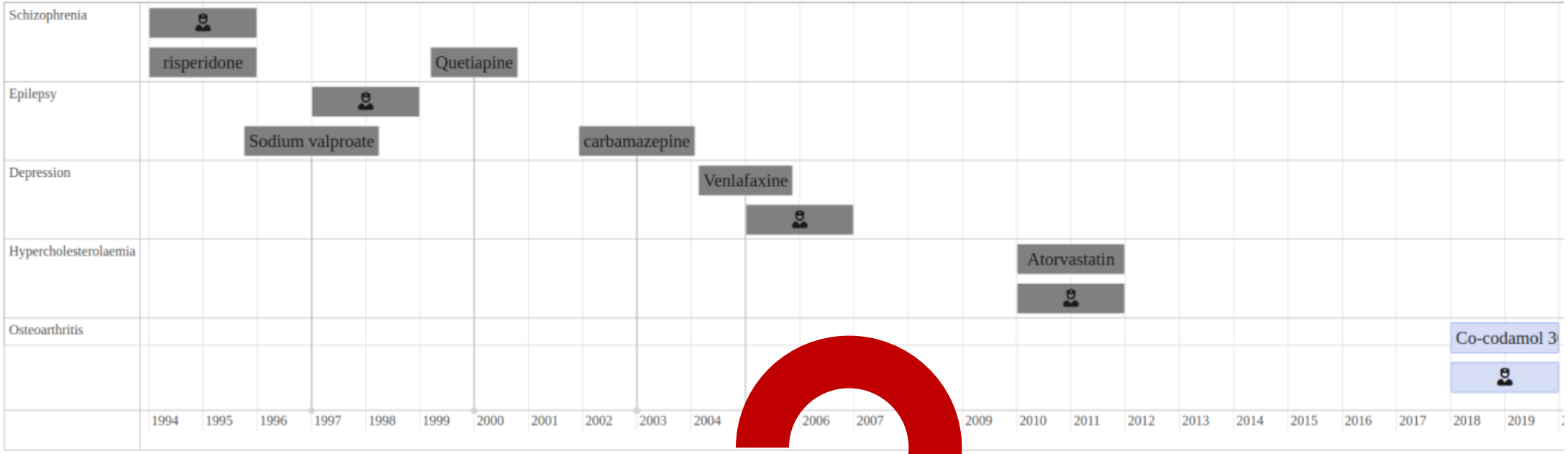
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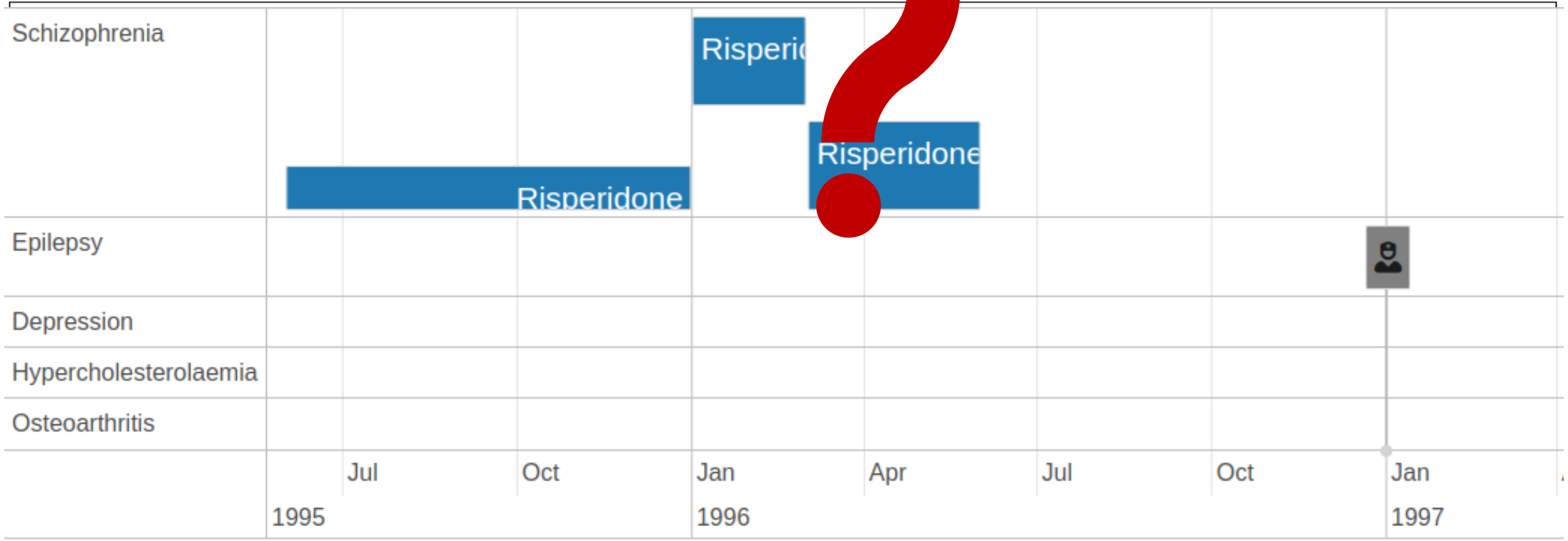
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DynAIRx

DynAIRx (AI for dynamic prescribing optimisation and care integration in multimorbidity) brings together a multidisciplinary team of experts in multiple long-term conditions and AI, including those with lived and caring experience, clinicians, data scientists & informaticians, and public engagement specialists from the Universities of Liverpool, Manchester, Glasgow and Leeds. It is co-led by Professor Iain Buchan and Dr Lauren Walker of Liverpool University, Liverpool University Hospitals NHS Foundation Trust and Mersey Care NHS Foundation Trust. The partnership was formed in 2020 in response to the Overprescribing Review and NIHR's AI for Multiple long-term conditions call.

Principal Investigators: Professor Iain Buchan and Dr Lauren Walker

Co-Investigators: Professor Mark Gabbay, Dr Eduard Shantsila, Gary Leeming, Professor Danushka Bollegala, Professor Simon Maskell, Alan Griffiths, Professor Andrew Clegg, Dr Samuel Relton, Professor Roy Ruddle, Professor Tjeerd Van Staa, Dr Matthew Sperrin, Professor Frances Mair, Dr Alan Woodall, Dr Olusegun Popoola

Project Team: Dr Micheal Abaho, Dr Aseel Abuzour, Dr Layik Hama, Samantha Wilson, Dr Asra Aslam, Harriet Cant, Dr Maurice O-Connell, Victoria Winters, Emma Lo

Website: https://www.liverpool.ac.uk/dynairx/

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