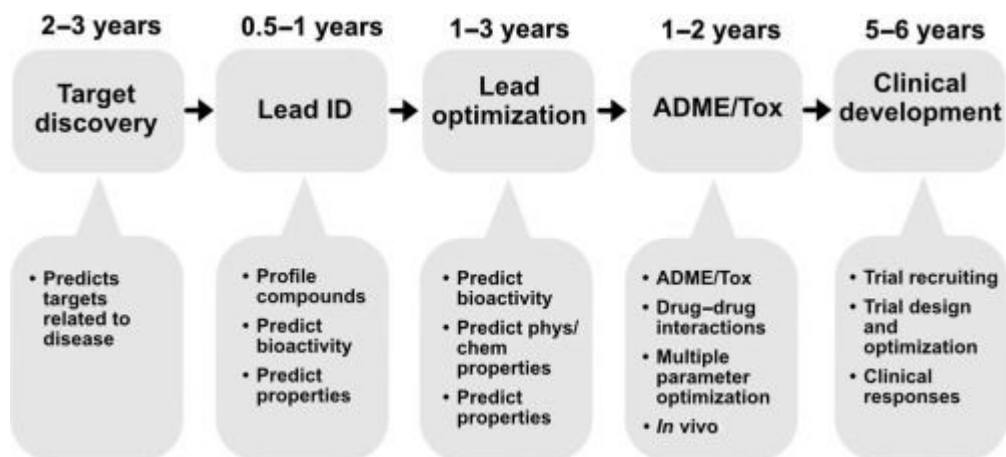


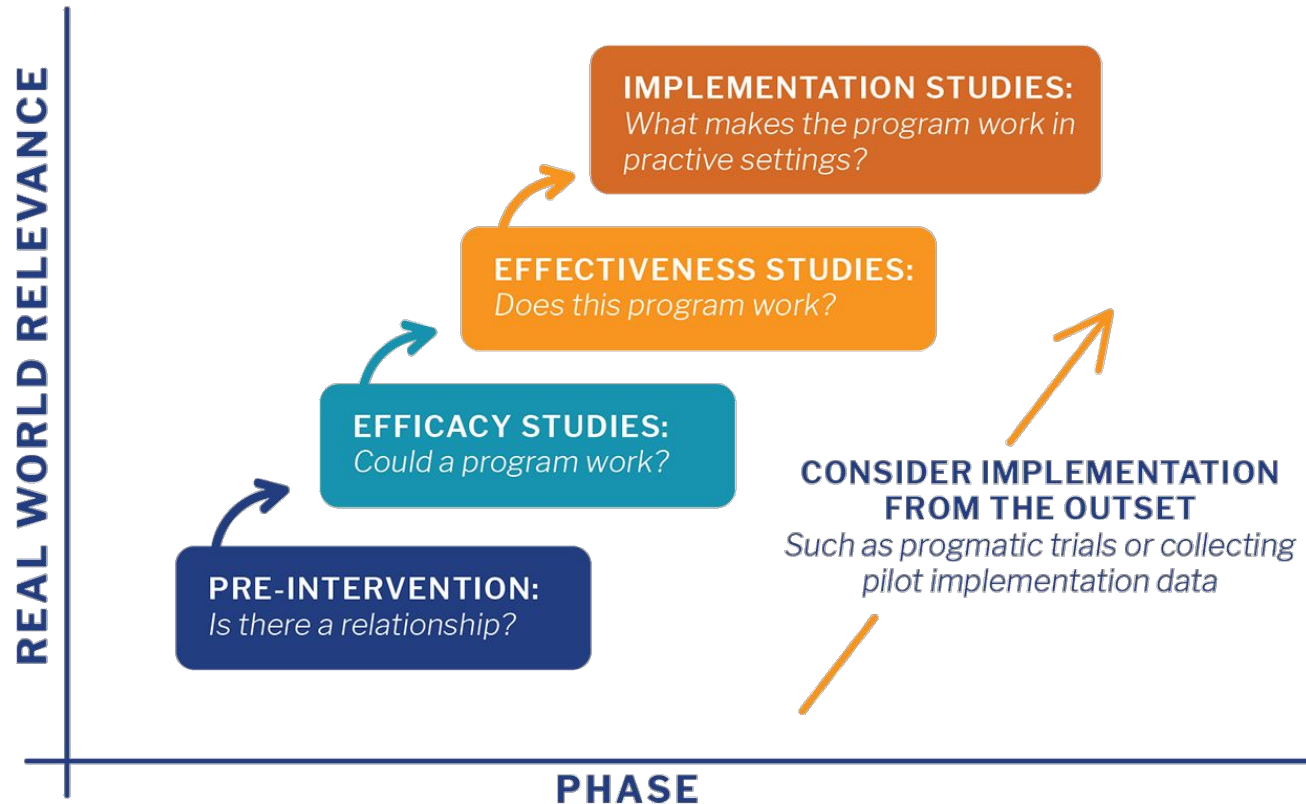
Proposal Class: Knowledge Translation

Transfer of research into practice is hard

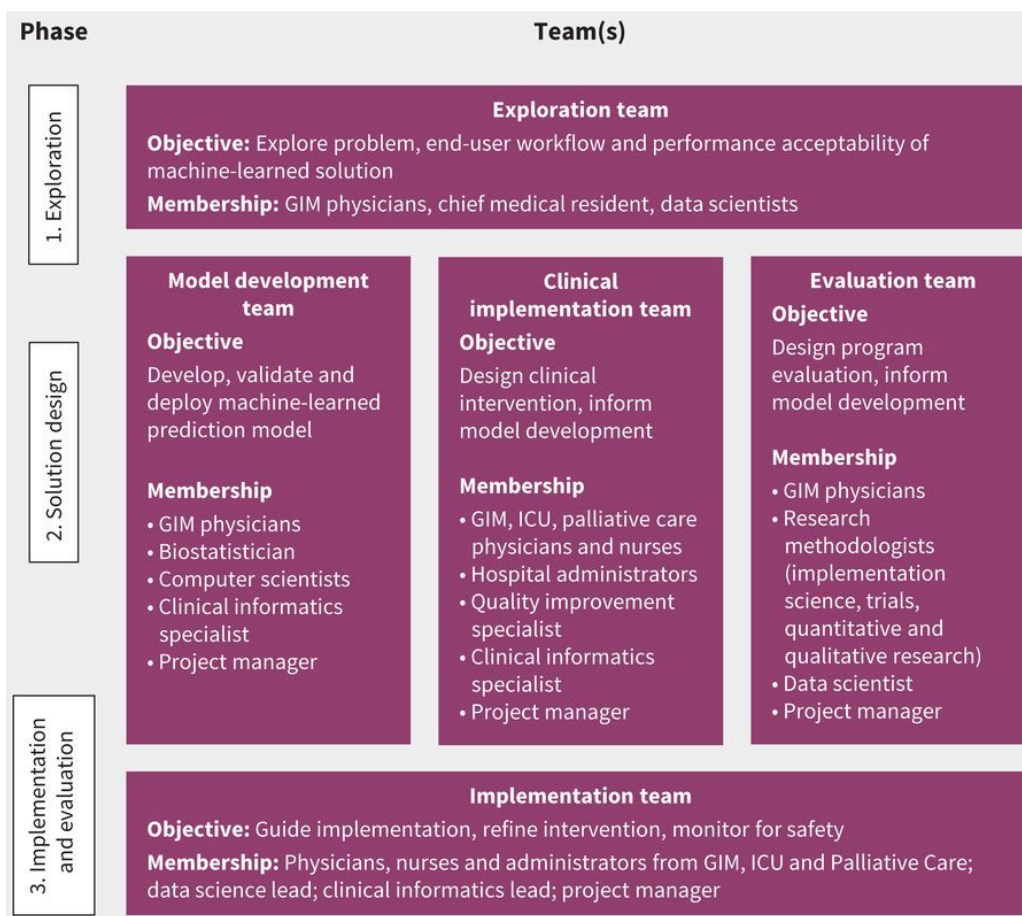
- 1922 Fleming discovers Penicillin (was he first?)
- 1938 Florey & Chain extract Penicillin
- 1940-1945 Animal and Human Trials
- 1945 onwards: Widespread use



Many steps to implementation



Many disciplines/teams involved



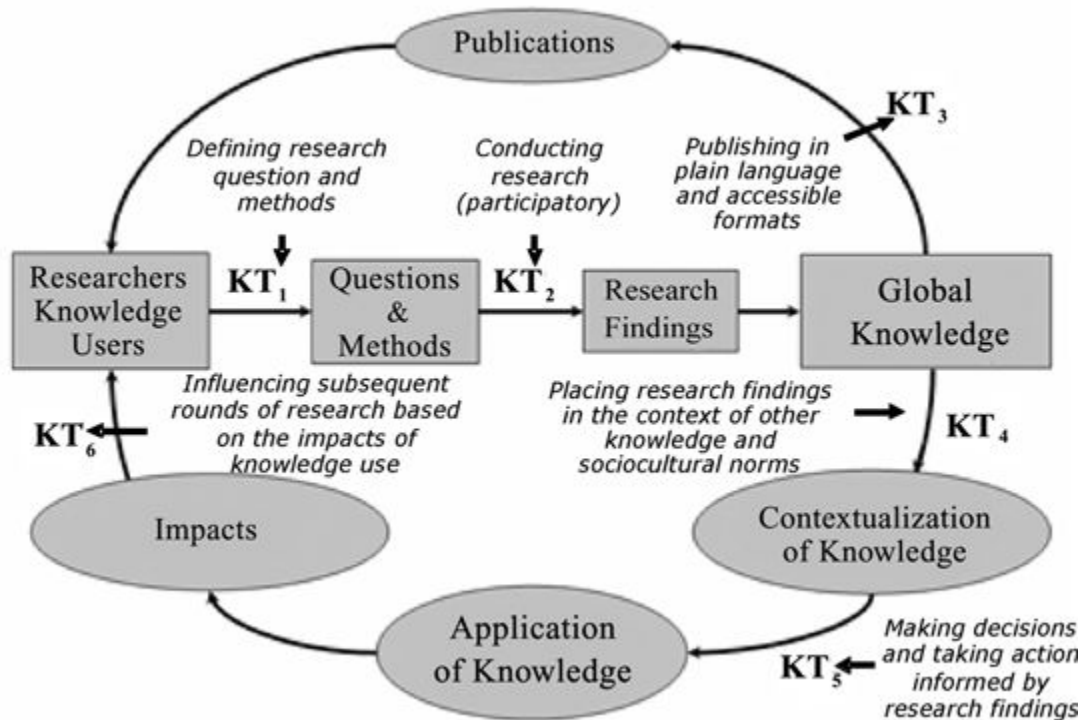
Many disciplines/teams involved

| Phase | Team(s) | | |
|--------------------|--|---|--|
| 1. Exploration | Exploration team Objective: Explore problem, end-user workflow and performance acceptability of machine-learned solution Membership: GIM physicians, chief medical resident, data scientists | | |
| 2. Solution design | Model development team Objective Develop, validate and deploy machine-learned prediction model Membership <ul style="list-style-type: none">• GIM physicians• Biostatistician• Computer scientists• Clinical informatics specialist• Project manager | Clinical implementation team Objective Design clinical intervention, inform model development Membership <ul style="list-style-type: none">• GIM, ICU, palliative care physicians and nurses• Hospital administrators• Quality improvement specialist• Clinical informatics specialist• Project manager | Evaluation team Objective Design program evaluation, inform model development Membership <ul style="list-style-type: none">• GIM physicians• Research methodologists (implementation science, trials, quantitative and qualitative research)• Data scientist• Project manager |
| | Implementation team Objective: Guide implementation, refine intervention, monitor for safety Membership: Physicians, nurses and administrators from GIM, ICU and Palliative Care; data science lead; clinical informatics lead; project manager | | |

Every step requires knowledge translation

Knowledge translation = closing of the gap between what we know and what we do.

- Information is explicit/factual
- Knowledge is integration of information into a specific context



Key steps in writing your KT plan

Develops a robust and impactful plan to effectively mobilise knowledge gained from the proposed research across a range of sectors/settings

- Builds (reciprocally) on initial question:
- **What problem** are you trying to address?
- **Which practice** will this impact?
- **Who** will you be trying to get to use this knowledge?
 - Academia/Research
 - Healthcare Professionals
 - Government
 - Health Administration
 - Community/Patients
 - Industry
- **How** will you communicate your findings to them?

Barriers to KT

1. Environment

- a. Centralised power
- b. Political instability/turnover
- c. Culture not used to evidence-based decisions
- d. Money

2. People (adopters)

- a. Past experiences
- b. Motivation to change (status quo benefits those in power)
- c. Lack of communication/mistrust
- d. Lack of skills to access/understand research

3. Barriers to evidence

- a. Lack of timely or relevant research
- b. Politicisation of research
- c. Poor quality research
- d. Inaccessibility of evidence

Specific barriers to ML in Healthcare

- Health **data** is a mess
- Health-related **IT** is a mess
- Healthcare is complicated - integration into existing **workflows**
- ML in healthcare requires genuine multi- and interdisciplinarity
- Healthcare provider acceptance:
 - Clear clinical value that improves patient outcomes
 - User-friendly/clinician-centric interfaces
 - Transparency/explainability
 - Independent validation and limitations clearly defined
 - Still allows contextualisation & clinical judgement
- Patient/public acceptance:
 - Overcoming past failures
 - General support but not universal nor unconditional (less trust from previously/currently mistreated groups)
 - “Uniqueness neglect” - treating the average person when the average person doesn’t necessarily exist
 - Lack of transparency on policy and regulation
- Governance:
 - Legally complex (medical device laws, anti-discrimination, medical liability, data protection, intellectual property, consumer protection laws all apply - contradictory)
 - Deployment, monitoring, standards, regulation all in flux and contradictory