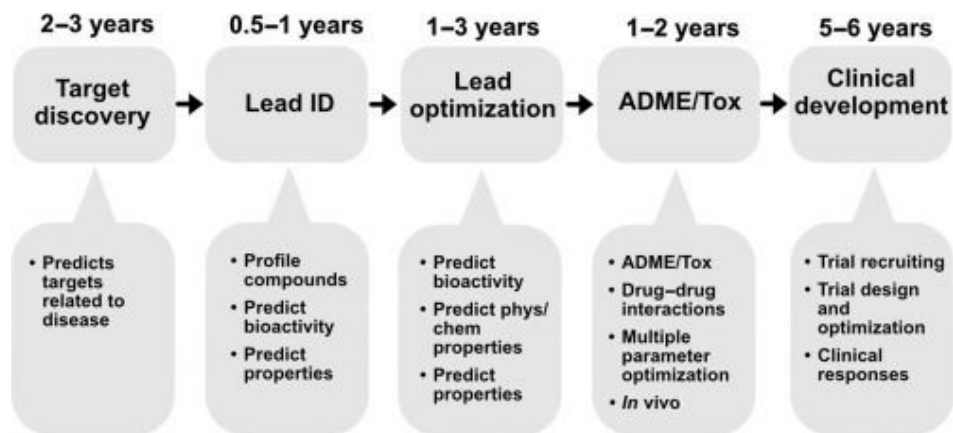
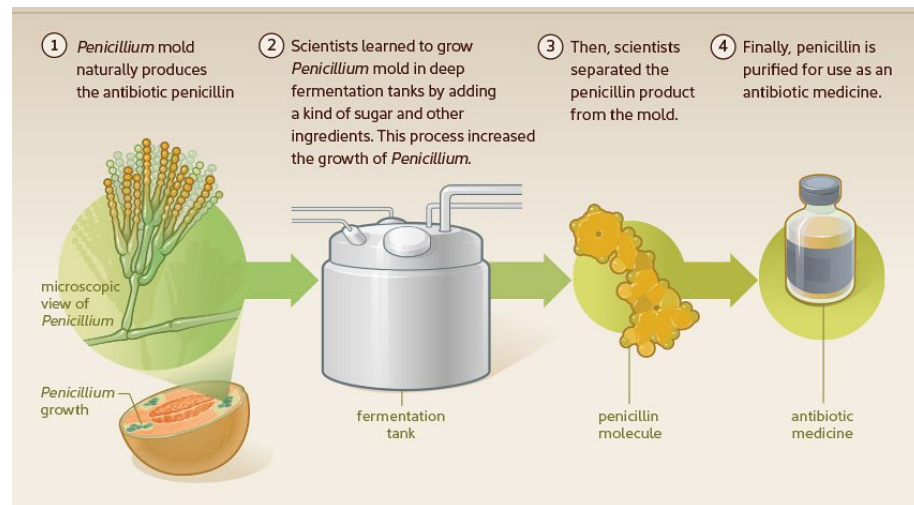


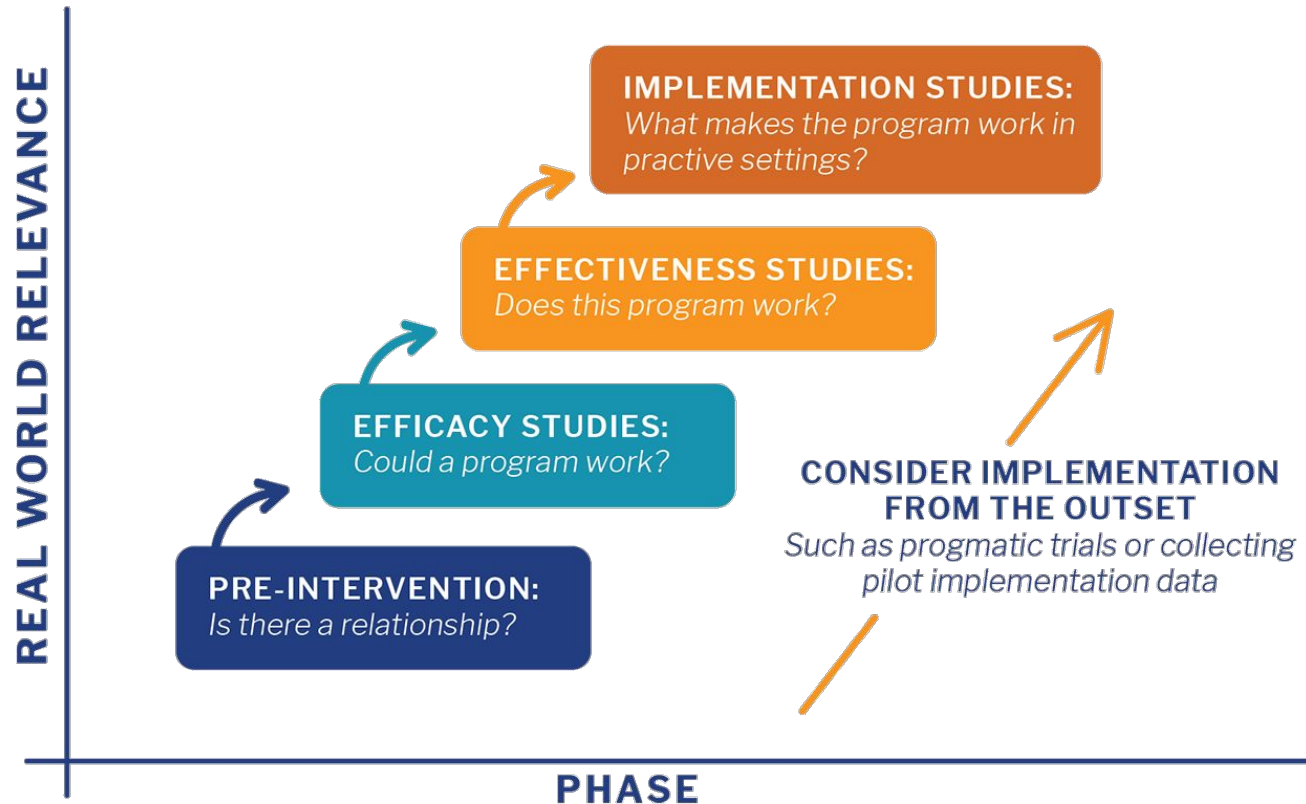
# Proposal Class: Knowledge Translation

# Transfer of research into practice is hard

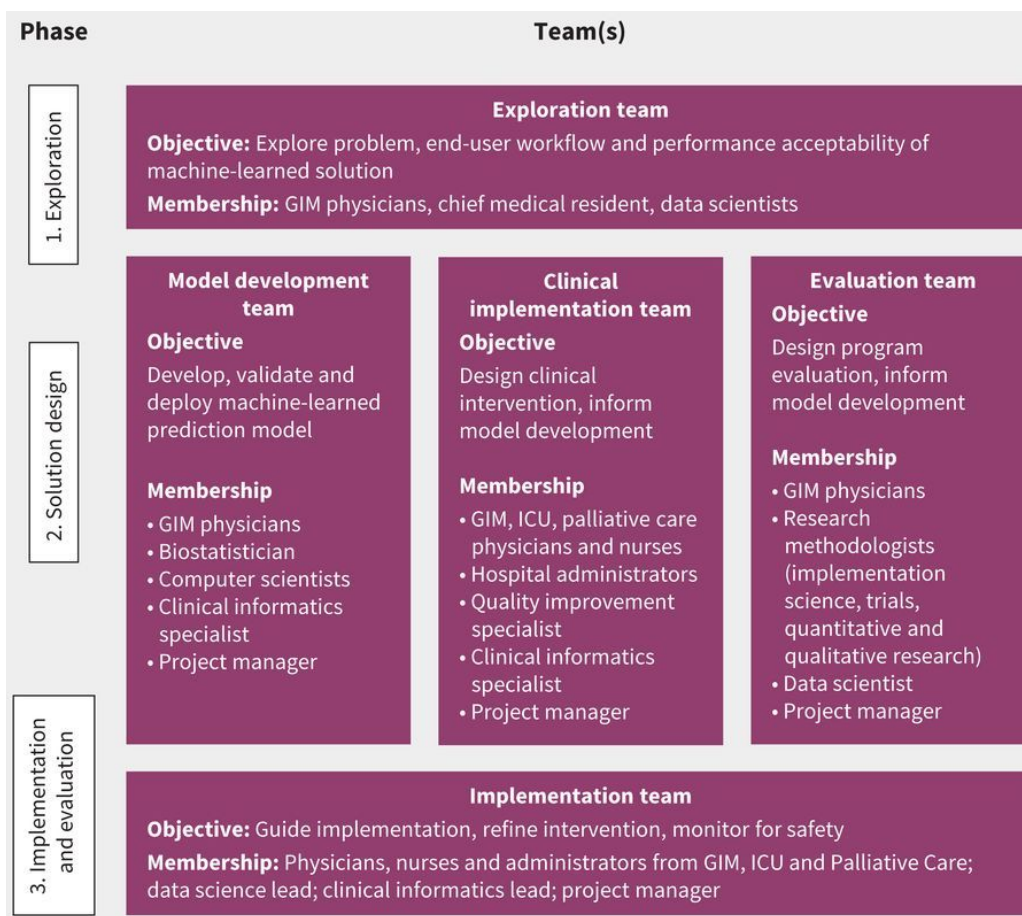
- **1928:** Fleming notices Penicillin
- **1929-1938:** No research
- **1939-1940:** Florey & Chain purify and successful animal trial
- **1941:** Failed 1 Human Trial (ran out)
- **1941-1943:** Production optimisation (fermenter & *P. chrysogenum* > *notatum* > *crustosum*) + Larger Human Trials (USA)
- **1943-1944:** US Pharmaceutical Industry Mass military production for D-Day
- **1945:** Civilian use in Allied Countries
- **1946-1949:** Geopolitical refusal to share technology & strains by US
- **1949:** Contributed to Soviet bloc leaving incipient WHO before WHA2
- **1950s:** Widespread global use due to WHO efforts, Rockefeller, and academic information sharing



# Many steps to implementation



# Many disciplines/teams involved



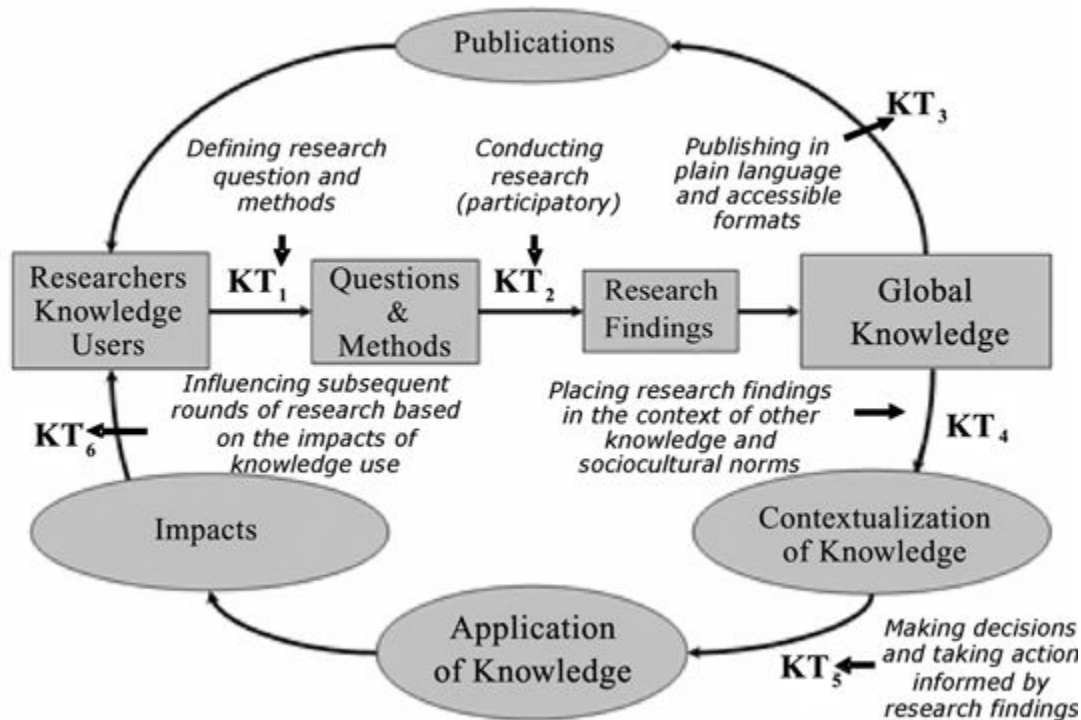
# Many disciplines/teams involved

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