Implementation Science in Health: Principles, Findings and Insights

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# Defining implementation science

1. Clinical research produces new evidence, innovation

2. Initial efforts to promote implementation

3. Measurement of rates of adoption (implementation) and implementation (quality) gaps

4. Research to develop and evaluate *implementation programs* to increase adoption

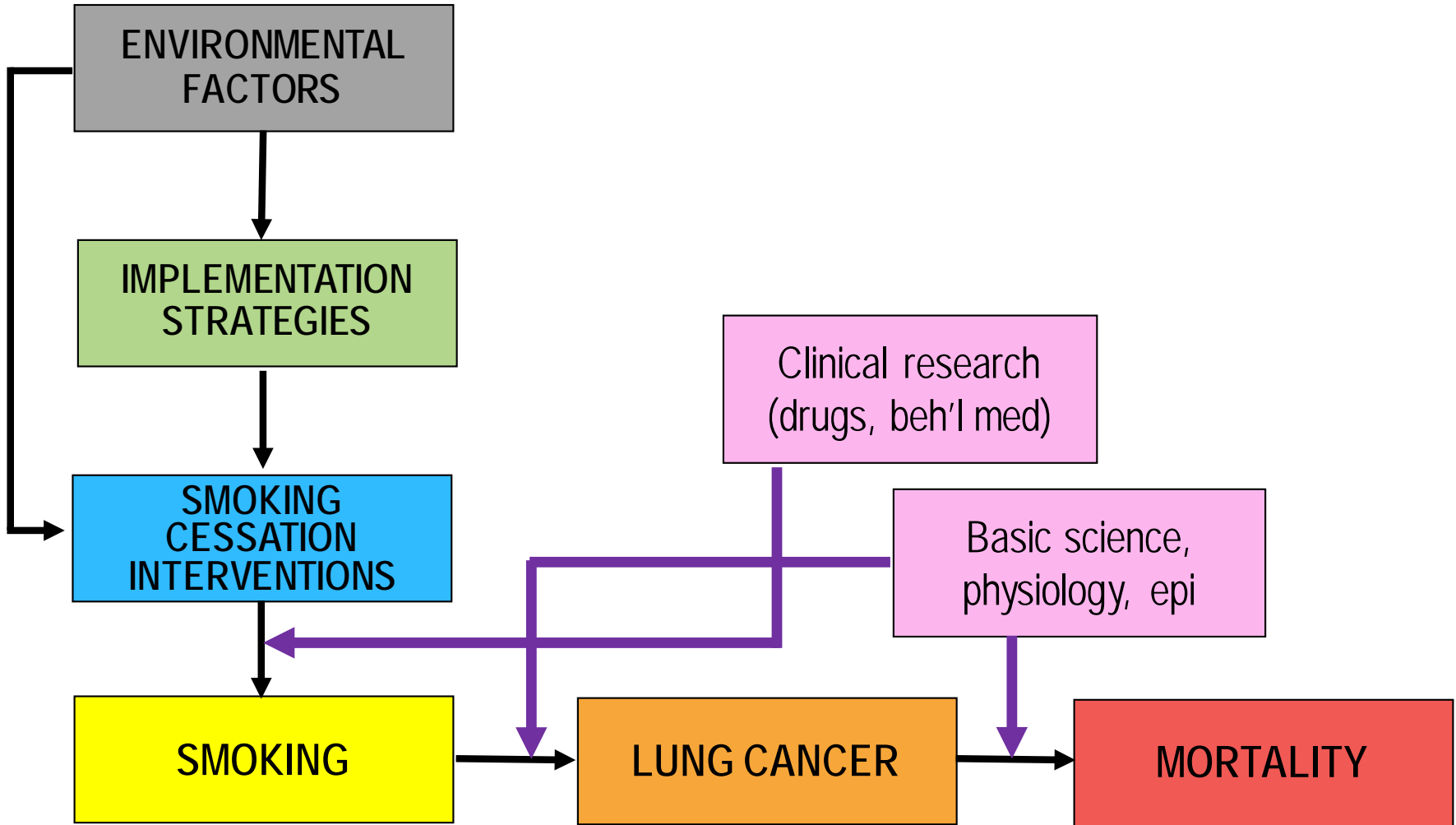* *quality improvement programs, practice change programs (interventions)*
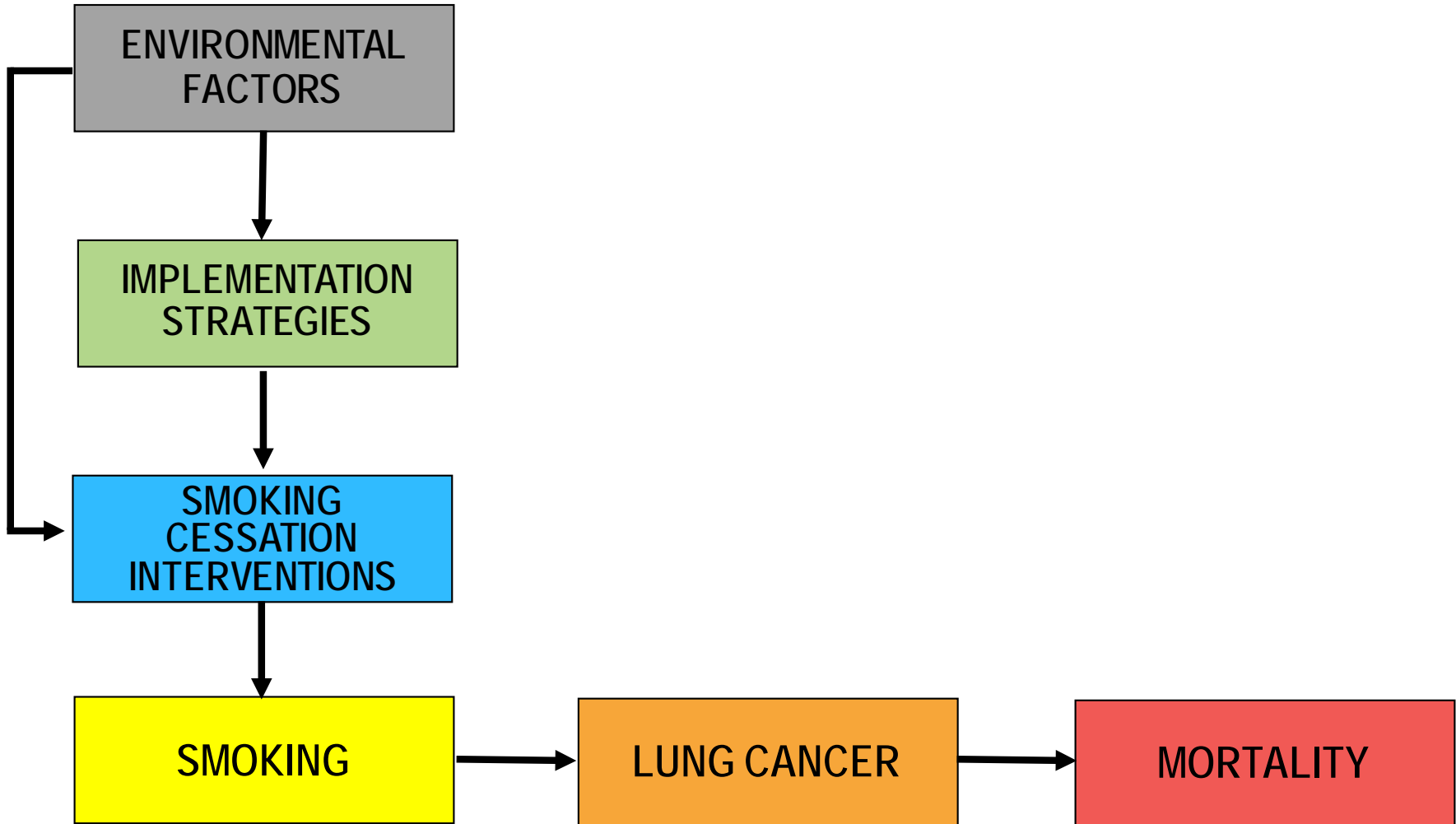
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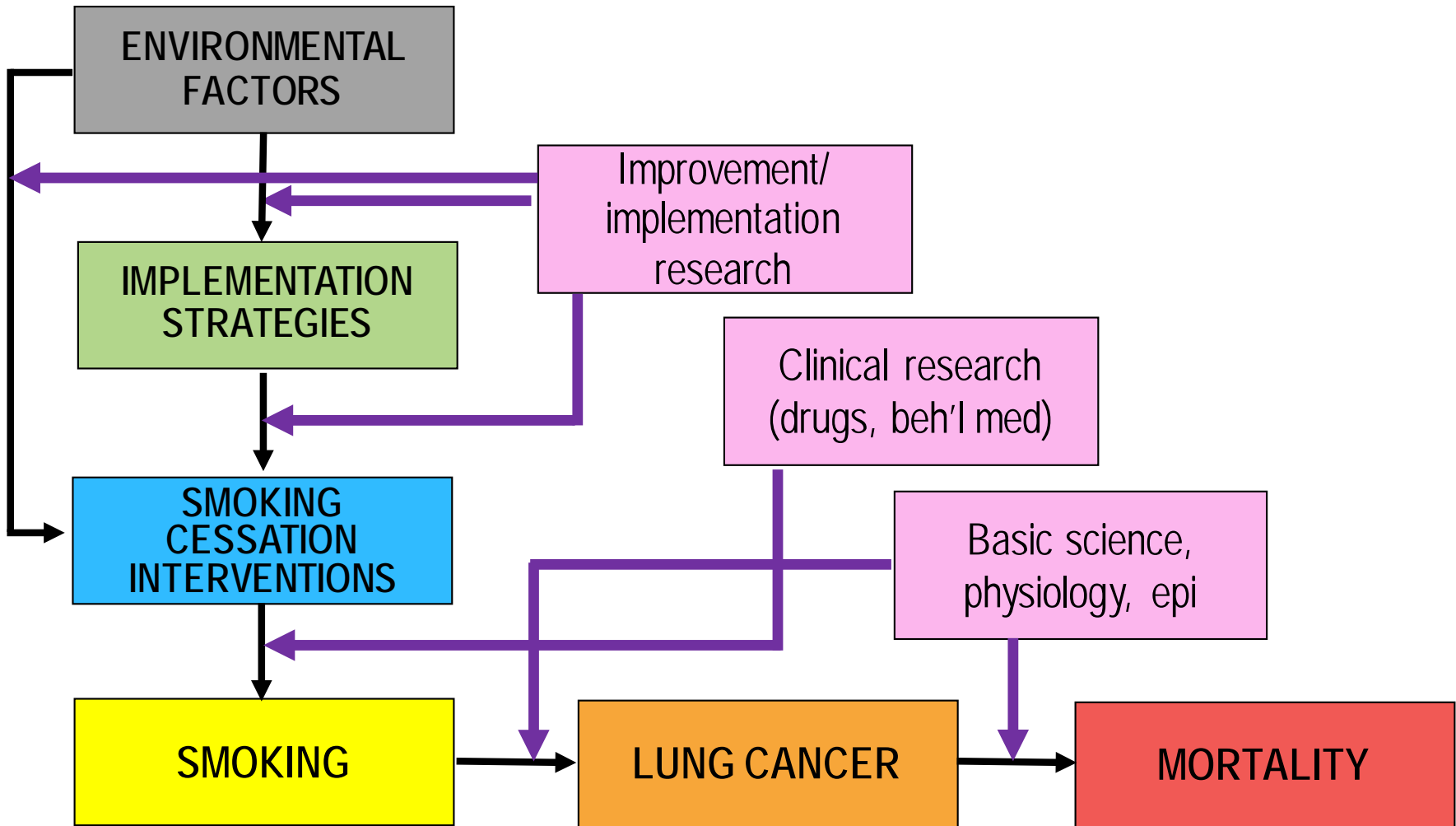
Causal pathways: treatment and prevention

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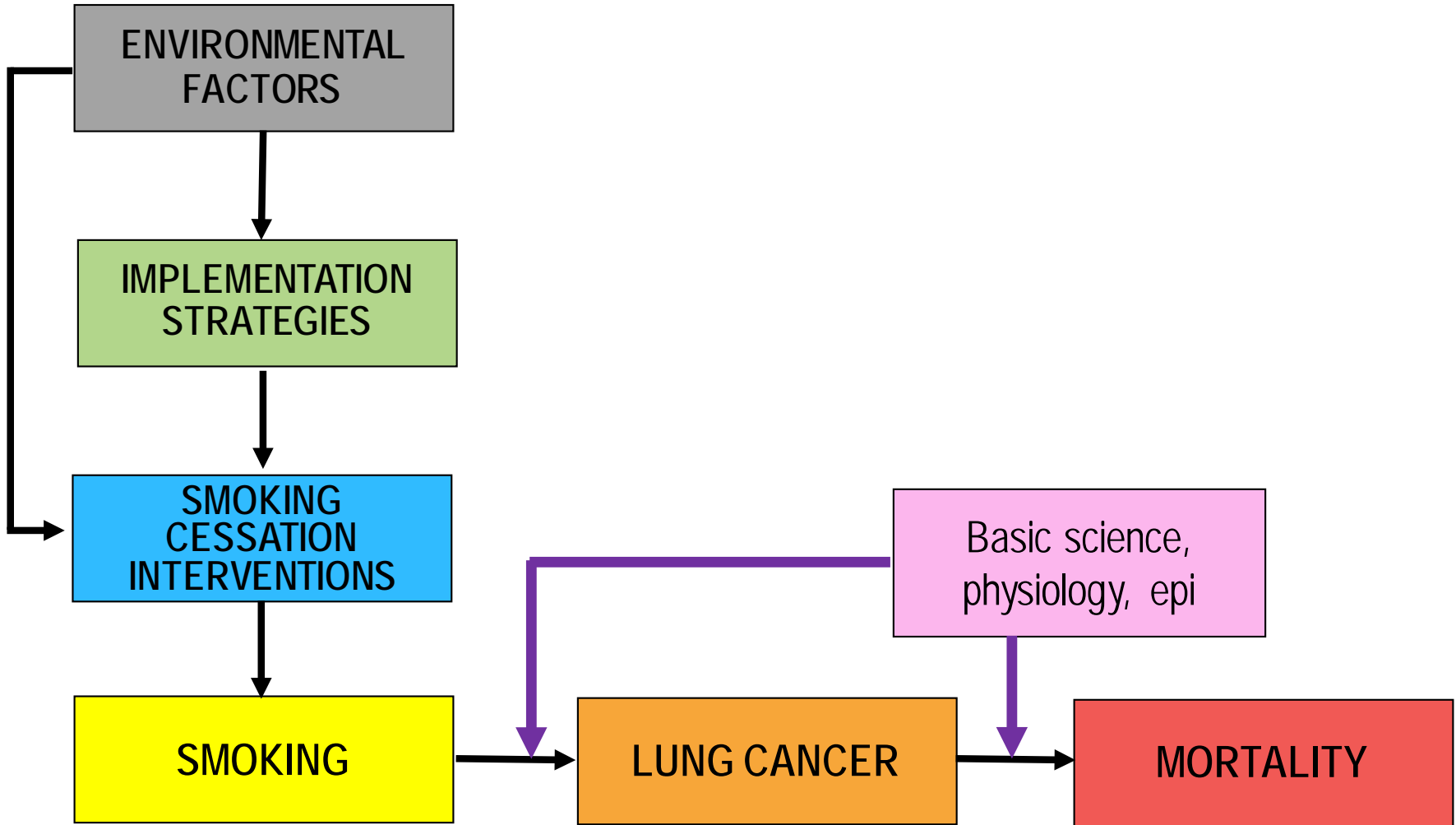
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The *Clinical Research Crisis*

- AAMC Clinical Research Summit: *Clinical Research: A National Call to Action* (Nov 1999)

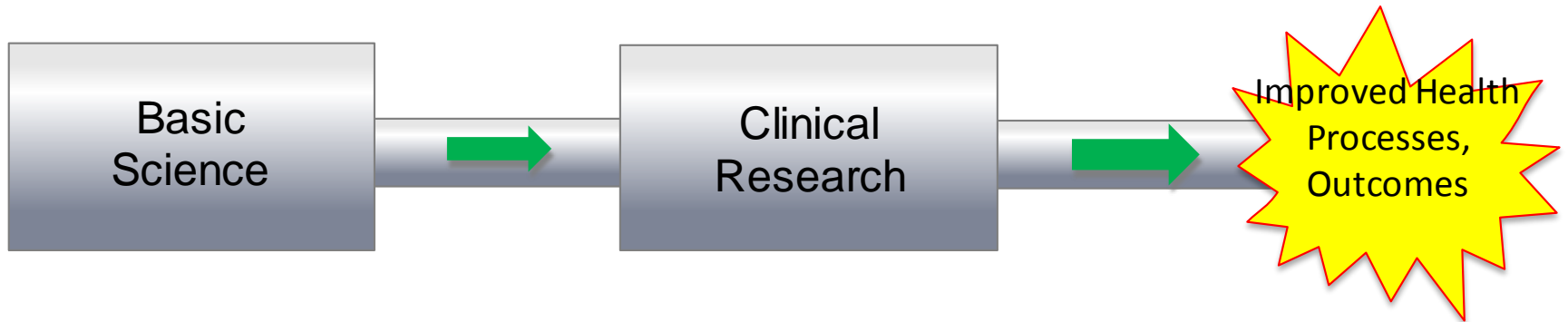- IoM Clinical Research Roundtable (2000-2004)

Central Challenges Facing the National Clinical Research Enterprise *JAMA. 2003;289:1278-1287*

Clinical Research in the United States at a Crossroads
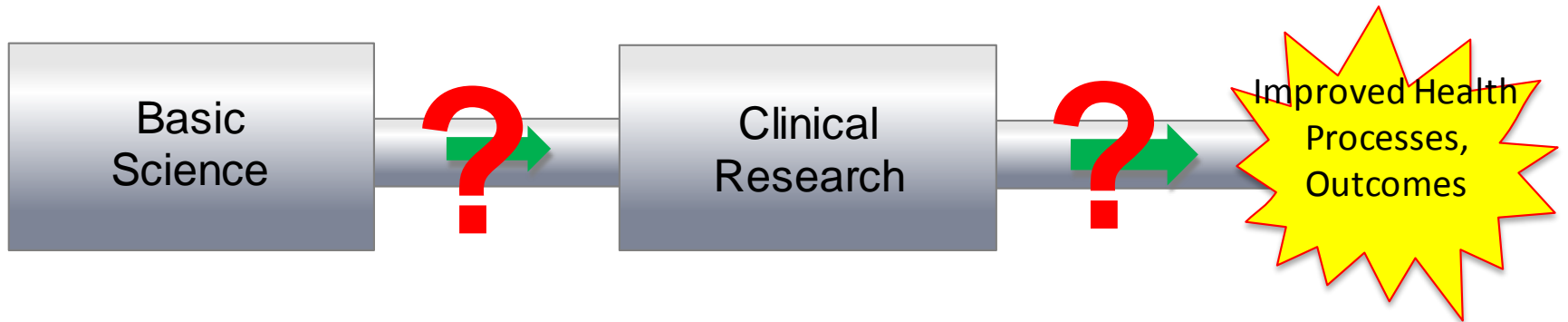Proposal for a Novel Public-Private Partnership to Establish a National Clinical Research Enterprise *JAMA. 2004;291:1120-1126*

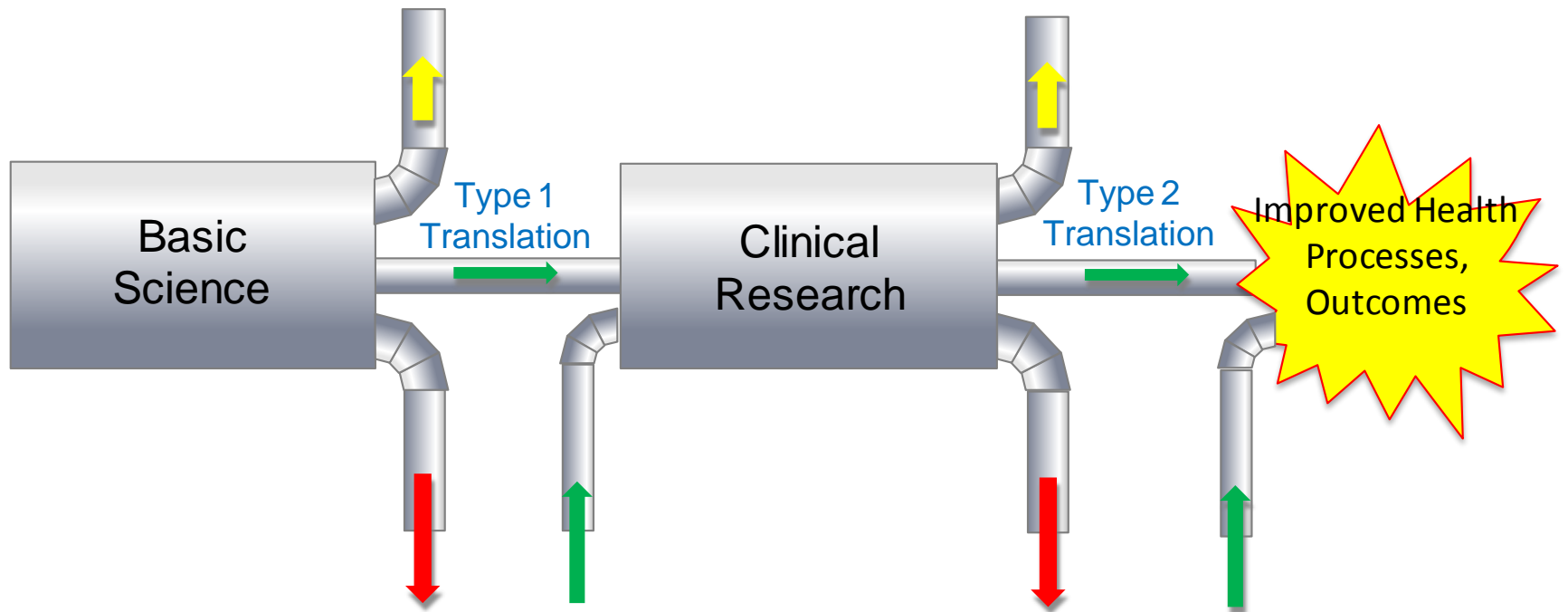- UK *Cooksey Report* (2006), other US and non-US reports

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Health benefits of research

Basic Science → Clinical Research → Improved Health Processes, Outcomes

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Translational research

Translational research
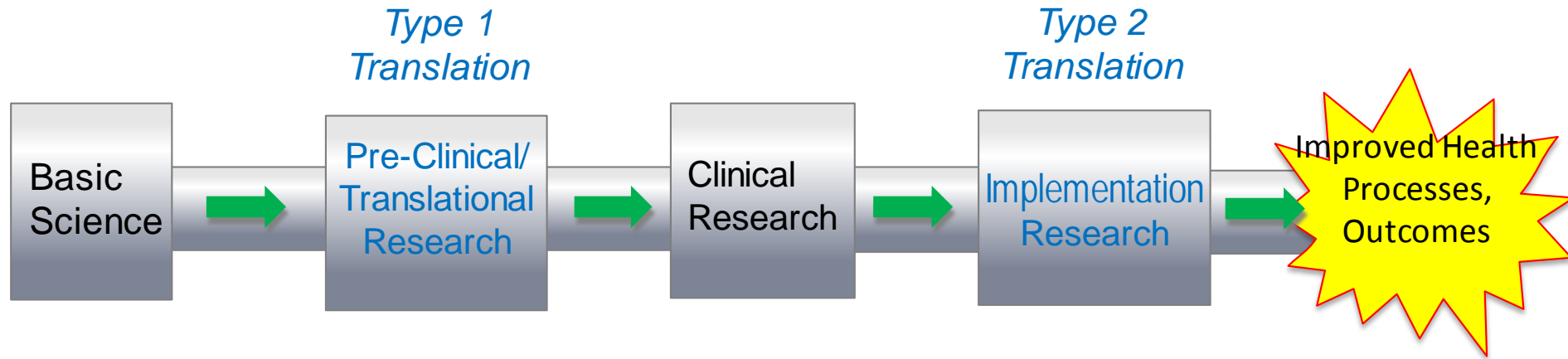
Implementation science definition

Implementation research is the scientific study of methods to promote the systematic uptake of research findings and other evidence-based practices into routine practice, and, hence, to improve the quality and effectiveness of health services.

It includes the study of influences on healthcare professional and organizational behavior.

Eccles and Mittman, 2006

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Implementation science aims

1. Develop reliable strategies for improving health-related processes and outcomes; facilitate widespread adoption of these strategies

2. Produce insights and generalizable knowledge regarding implementation *processes*, *barriers*, *facilitators*, *strategies*

3. Develop, test and refine implementation theories and hypotheses; methods and measures

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Implementing innovative practices, guidelines: *general insights, principles*

Health-related (professional) practices are:

- Highly stable and slow to change; *clinical inertia, conservatism*

  - *With occasional exceptions (CT scans, robotic surgery)*

Implementation gaps and their root causes are:

- Variable, heterogeneous (across time, place, problem)

- Multi-faceted, multi-level

- *Not responsive to simple practice change strategies*

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Selected barriers to implementation

- Insufficient information, knowledge, skill, time

- Too much information

- Evidence is not accepted as legitimate

- Implementation gaps not recognized

- Misaligned financial incentives

- Insufficient staff or systems support

- Lack of external pressure, expectations

Levels of influence on clinical practice

- Point of care (MD knowledge, patient demand)

- Microsystem, team (norms, culture)

- Clinic, hospital (policies, leadership)

- Delivery system (organizational/fiscal policies, leadership, resources)

- Professional norms (local, regional, national)

- Patients, businesses, other stakeholders (community, region, province/state, nation)

- Local, regional, national regulations

- *Contrast with "1950s medicine"*

Requirements for practice change

1. Valid, legitimate, accepted evidence
2. Clinician/staff knowledge, skill
3. Supportive professional norms
4. External expectations, monitoring, pressure/incentives
5. Patient acceptance
6. Evidence of quality gaps
7. Etiology of practices, quality gaps
8. Feasible methods/systems

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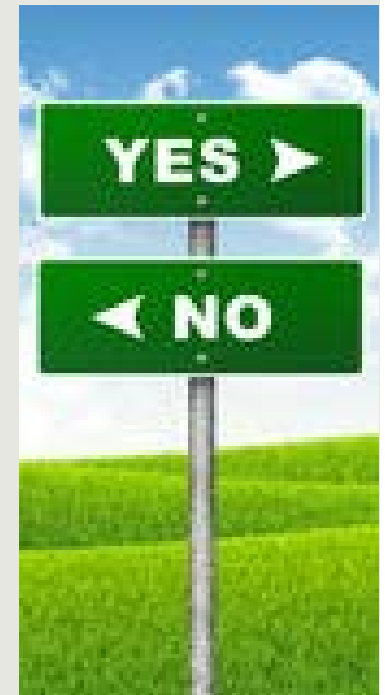
Policy/practice decision makers' questions

Does it work? Is it "*effective*"?

- *Should it be approved? Funded? Promoted? Mandated?*

- *Included in the formulary?*

- *Should I use it?*

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Is an intervention <u>E</u>ffective?

- *Do outcomes differ for those receiving the intervention vs. not (or intervention A vs. B)?*

- *Do selected features of intervention settings and targets influence effects?*

- *Gold standard method: randomize and measure outcome differences; perform subgroup analyses ... or use other impact-focused designs*

- *Focus is on **impact***

Policy/practice decision makers' questions

Does it work? Is it "effective"?

- For some drugs, the answer is "Yes, for many/most patients" (but *cf* precision medicine)

- For *robust* complex interventions (e.g., some health promotion programs, healthcare delivery innovations) the answer is "Yes, often enough"

- For *most* complex interventions, the answer is "sometimes"…"it depends"

Finding "effective" complex interventions

Research should seek to develop, evaluate and provide evidence for robust, reliable interventions (programs)

– Assumes "robust/reliable strategies" can be discovered or developed

Unfortunately:

▪ <u>Outcomes</u> are often strongly influenced by contextual factors; intervention *main effects* are often weak …

▪ Interventions are often unstable, varying across time/place …

▪ In part because intervention <u>impacts</u> are often indirect (mediated), and thus attenuated and variable

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Policy/practice decision makers' questions

- Support for dichotomous decisions, selection decisions (FDA and formulary, treatment):

    - *Does it work? Is it effective? Which is more effective?*

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Policy/practice decision makers' questions

- Support for dichotomous decisions, selection decisions (FDA and formulary, treatment):
  - *Does it work? Is it effective? Which is more effective?*

- Insights and guidance for practice:
  - *How does it work? Why? Where? When? For Whom?*
  - *How can we enhance its effectiveness?*

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