HOW TO APPLY THE MULTIPHASE OPTIMIZATION STRATEGY (MOST) IN YOUR INTERVENTION DEVELOPMENT RESEARCH

Module 6

Completing the optimization phase and identifying your next steps

Lesson 1: What it means to conclude the optimization phase of MOST

NYU SCHOOL OF GLOBAL PUBLIC HEALTH

Intervention Optimization Initiative

This course was developed by

Linda M. Collins

School of Global Public Health

New York University

(narrator)

Kate Guastaferro

College of Health and Human Development

The Pennsylvania State University

In this lesson you will learn how to:

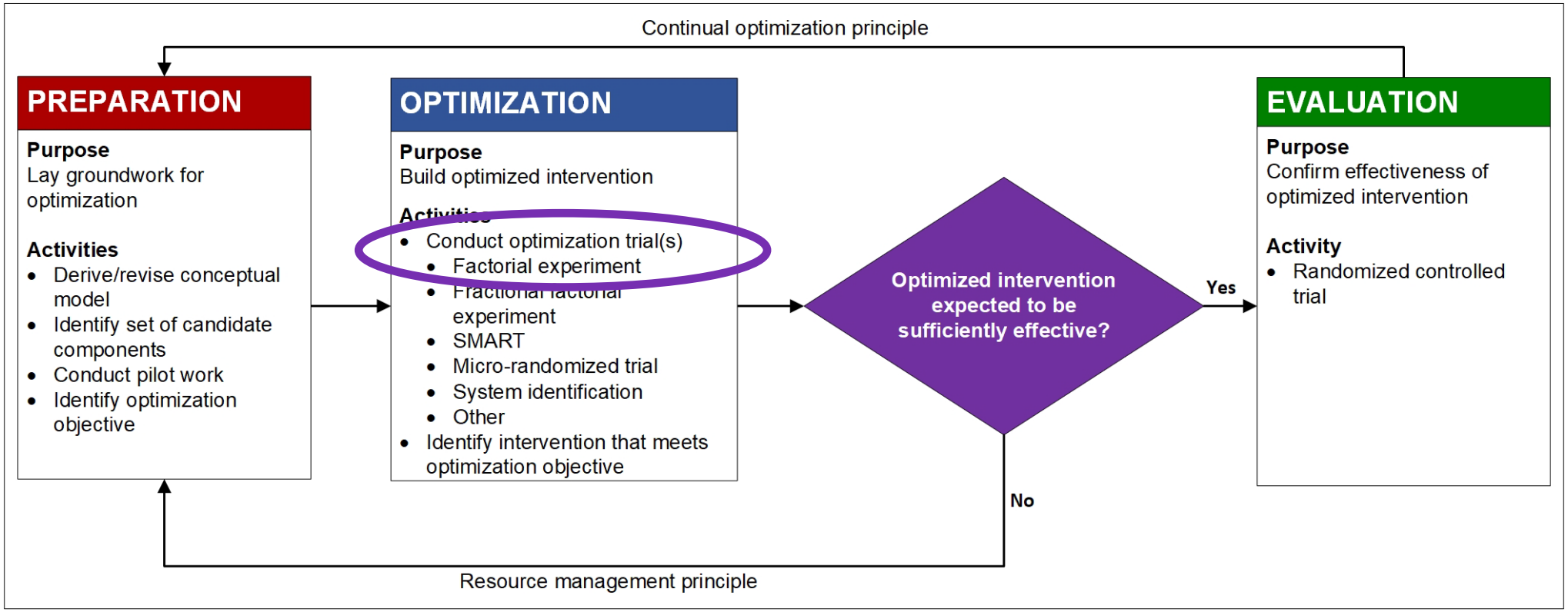
- Understand what it means to conclude the optimization phase of MOST
- Be aware of the need to stay current with the rapidly changing field of decision-making for intervention optimization

To prepare for this module you may wish to review previous material, particularly

- Optimization objectives (Module 2; Chapter 2 in text)
- Definitions of main effects and interactions (Module 3; Chapters 3 and 4 in text)
- How to interpret interactions (Module 3, Chapters 3 and 4 in text)
- The conclusion-priority and decision-priority perspectives (Module 4, Chapters 3 and 4 in text)

What it means to conclude the optimization phase of MOST

- SUPPOSE YOU ARE IN THE OPTIMIZATION PHASE OF MOST:
  - Previously you identified an optimization objective
    - Your definition of intervention ***EASE***
      - e.g. most effective for < $300 per participant
  - You are conducting an optimization trial
    - In this case, a factorial experiment



Flow chart of the three phases of the multiphase optimization strategy (MOST). Rectangle = action. Diamond = decision.

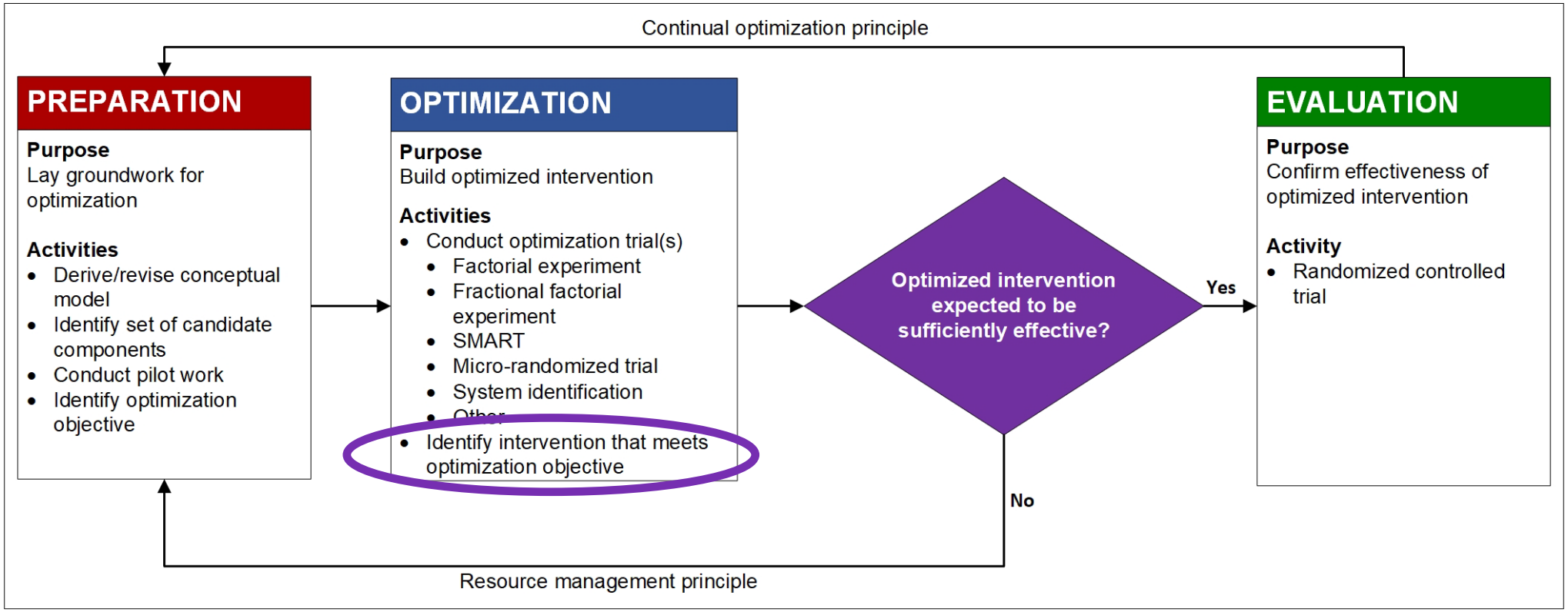
Figure adapted from Collins, L.M. (2018)

What it means to conclude the optimization phase of MOST

- SUPPOSE THIS IS WHERE YOU ARE:
  - Previously you identified an optimization objective
    - Your definition of intervention ***EASE***
      - e.g. most effective for < $300 per participant
  - Now suppose some time has gone by and you've completed the optimization trial
  - You've analyzed the data and have the results

What it means to conclude the optimization phase of MOST

- NOW WHAT????
- You have some important decisions to make



Flow chart of the three phases of the multiphase optimization strategy (MOST). Rectangle = action. Diamond = decision.

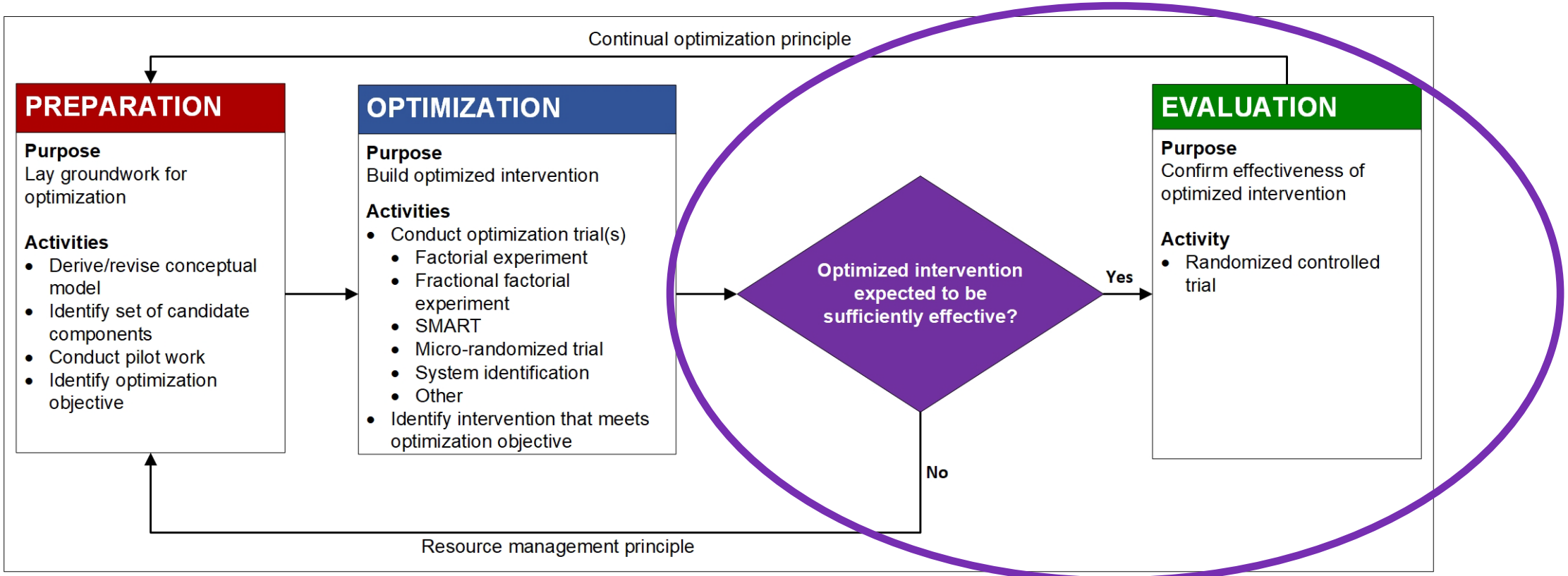
Figure adapted from Collins, L.M. (2018)

What it means to conclude the optimization phase of MOST

- NOW WHAT????
- You have some important decisions to make
- You need to:
  - Identify the intervention that meets the optimization objective
    - In other words: Decide which components/component levels will make up the optimized intervention

What it means to conclude the optimization phase of MOST

- NOW WHAT????
- After you have identified the optimized intervention, you are not done!
- You need to decide on your next steps



Flow chart of the three phases of the multiphase optimization strategy (MOST). Rectangle = action. Diamond = decision.

Figure adapted from Collins, L.M. (2018)

What it means to conclude the optimization phase of MOST

- So concluding the optimization phase means:
  - Identifying the components and component levels that make up the optimized intervention
    - We will discuss this here and in the next lesson
  - Deciding on what your next steps will be after identifying the optimized intervention
    - We will discuss this later in this module

Overview of current best practices

- How do you decide which components/component levels?
- An approach is outlined in Chapter 7 of Collins (2018) and Collins et al. (2014)

Overview of current best practices

- This approach will be covered in this module. It is based on:
  - Initially selecting components/levels based on main effects
  - Then, reconsidering the initial decisions in the light of any interactions
  - Then, if cost is a consideration, identifying combination that yields best $\hat{Y}$ without exceeding specified cost limit

BEST PRACTICES ARE LIKELY TO CHANGE SOON

- The Collins (2018; Collins et al., 2014) approach is limited
- Single outcome
- Objective: to identify best expected outcome subject to an upper limit on cost
  - Defined upper limit on cost necessary
  - Not designed for cost-effectiveness

BEST PRACTICES ARE LIKELY TO CHANGE SOON

- This is an area where a lot of work is being done
- There will be new approaches very soon
- Be sure to watch
  - The scientific literature
  - Linda Collins's twitter feed @collins_most
  - The Intervention Optimization Initiative website http://publichealth.nyu.edu/ioi

In this lesson you learned how to:

- Understand what it means to conclude the optimization phase of MOST
- Be aware of the need to stay current with the rapidly changing field of decision-making for intervention optimization

In the next lesson you will learn how to:

- Understand what are current best practices for empirically identifying an optimized intervention

References Cited

- Collins, L., Trail, J., Kugler, K., Baker, T., Piper, M., & Mermelstein, R. (2014). Evaluating individual intervention components: Making decisions based on the results of a factorial screening experiment. *Translational Behavioral Medicine, 4*, 238-251.