

# Geisel Curriculum in the Science of Clinical Decision Making

Boyoung Ahn MS, James E. Stahl, MD, MPH



## Literature Review

- Studies show that physicians are subject to the same cognitive limitations and biases that affect us in our day-to-day lives (Chapman et al).
- Physician bias is implicated in negative health outcomes for patients and perpetuate larger health care disparities (Blair et al).
- There are numerous strategies that are used to mitigate these limitations among physicians, including shared decision making, standard gamble, time trade off, and decision analysis.
- It is critical to train future physicians in the science of clinical decision making to optimize health outcomes for the patients.
- This work identified key objectives and curriculum in clinical decision making that can be developed for pre-clinical students at Geisel School of Medicine.

## Course Objectives

### Decision Psychology

- Understand current basic theory of decision psychology
- Understand common bugs/features of the decision making system
- Understand some basic tools and strategies to mitigate system challenges

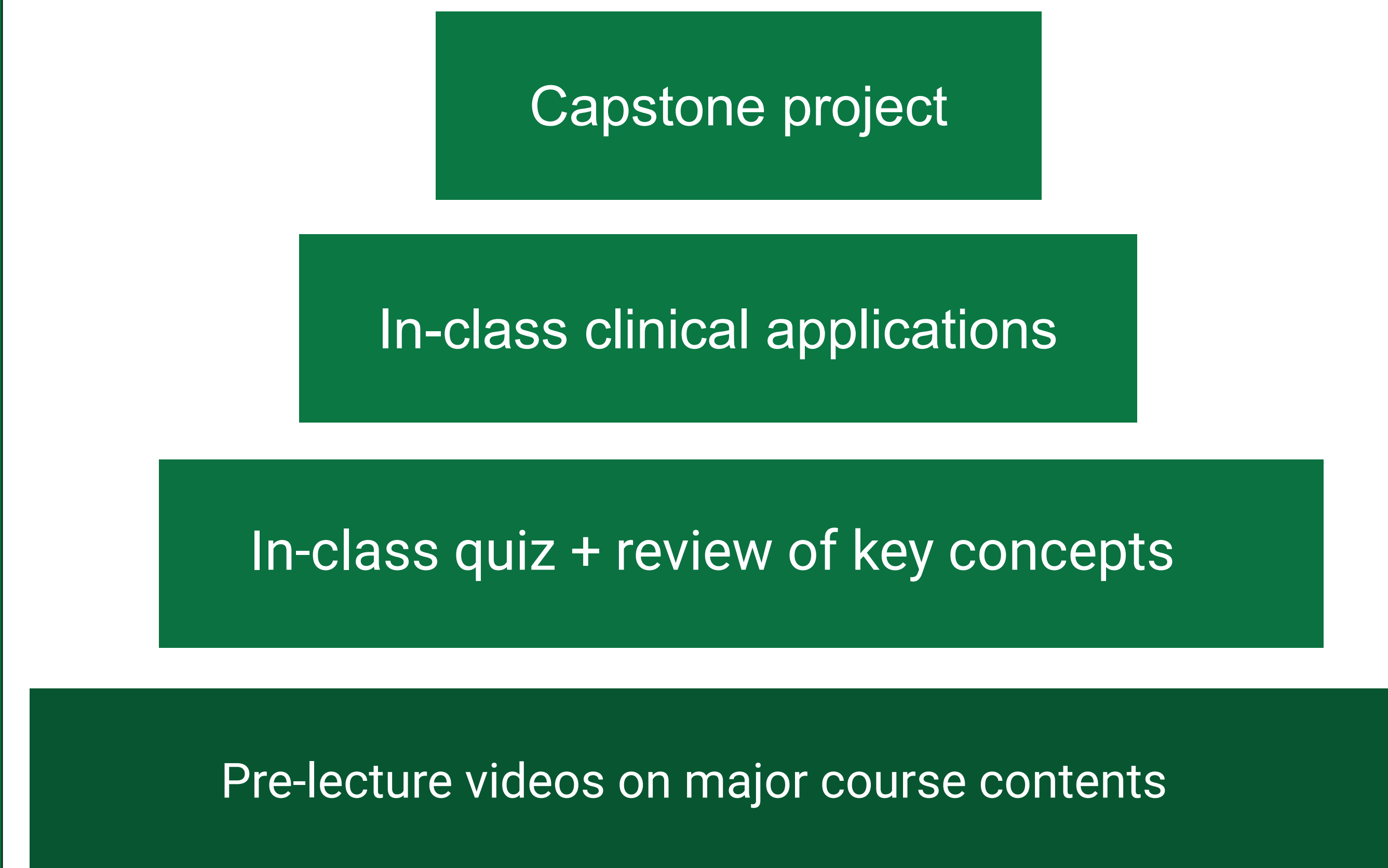
### Risk, Uncertainty, and Value

- Understand the difference between probability, uncertainty and risk
- Understand the basics of the influence of risk on behavior
- Understand the basic connection between risk, value and preferences

### Science of Medical Decision Making

- Understand basic concepts of decision analysis
- Understand basic concepts of cost-effectiveness
- Understand the concept of value of information

## Curriculum Outline



### Decision Psychology

- Type 1 and Type 2 systems
- System bugs (features)
  - Biases
  - Heuristics
  - Mind sets
  - Consistency imperative
- What you can do about it
  - Decision rules
  - Strategies for countering cognitive error

### Risk, Uncertainty, and Value

- Probability, Uncertainty and Risk
- Bayes' Theorem
- Prospect theory
- Risk Tolerance/Aversion
- Framing
- Value and Utility
- Preference elicitation and shared decision making

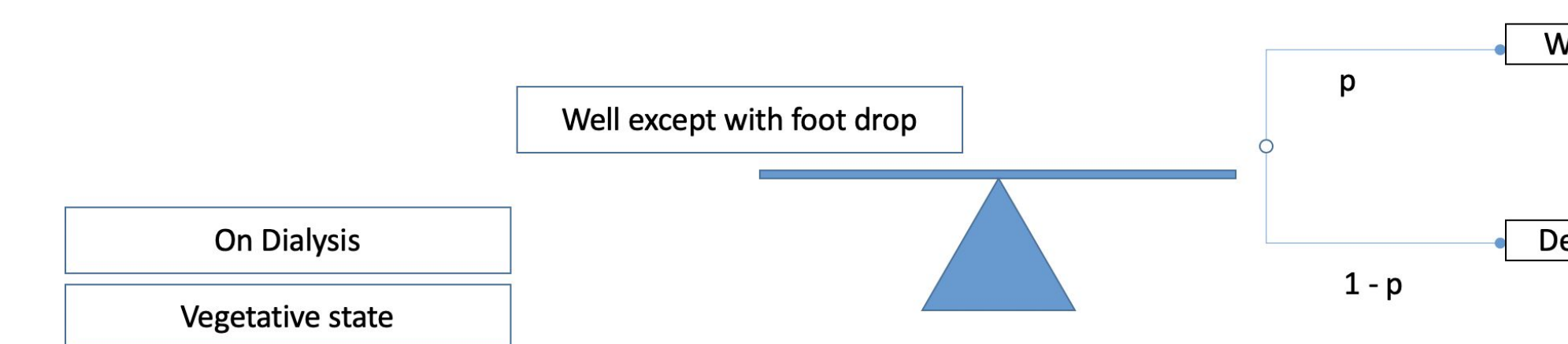
### Science of Medical Decision Making

- Decision tree
- Expected Utility
- ICER
- Sensitivity analysis
- Value of information

## Lecture Materials

### Standard Gamble

You are admitted to hospital due to an unknown illness. You may end up in one of the following health states. I offer you a magic pill that will either kill you immediately or fully cure you. What is  $p$ ?



### TTO

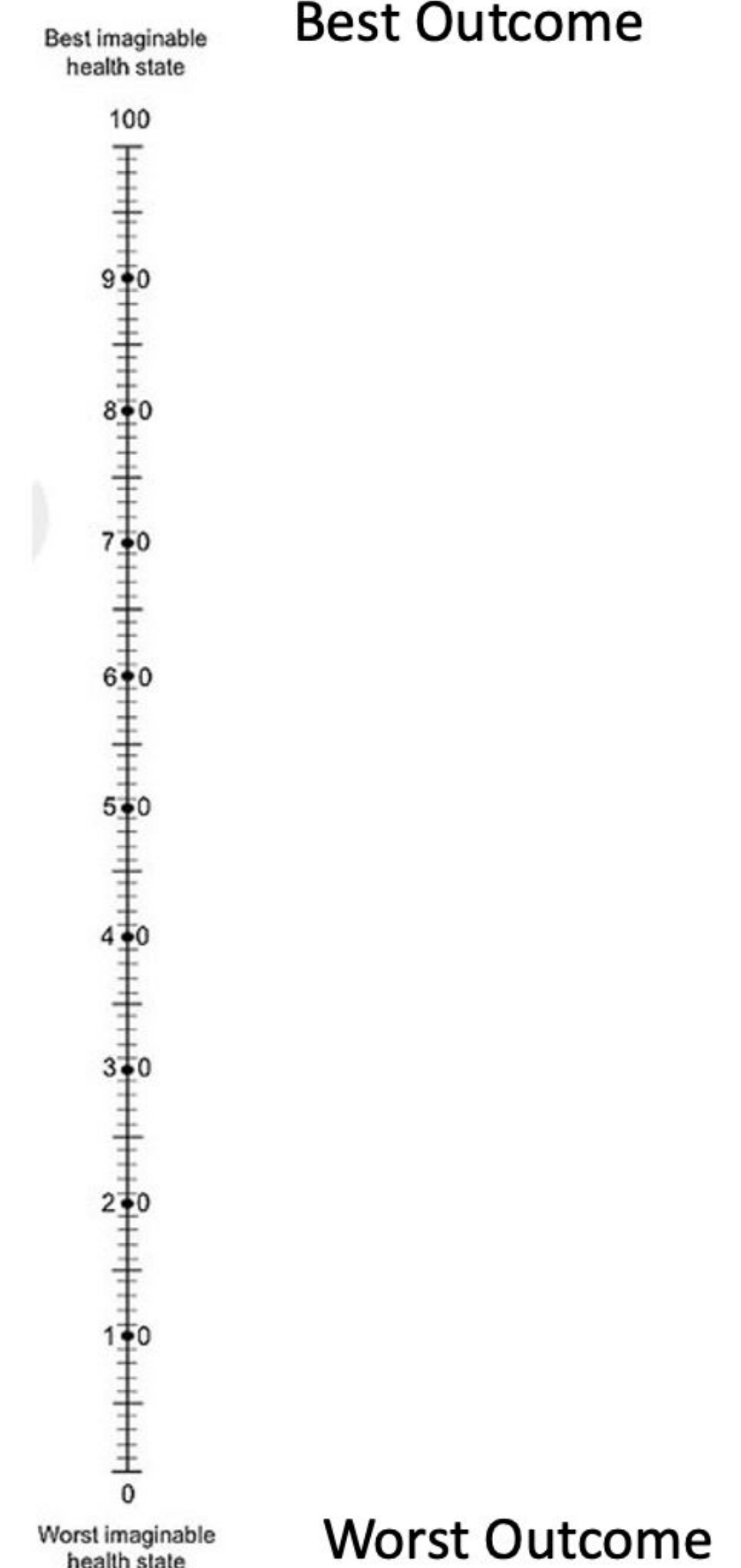
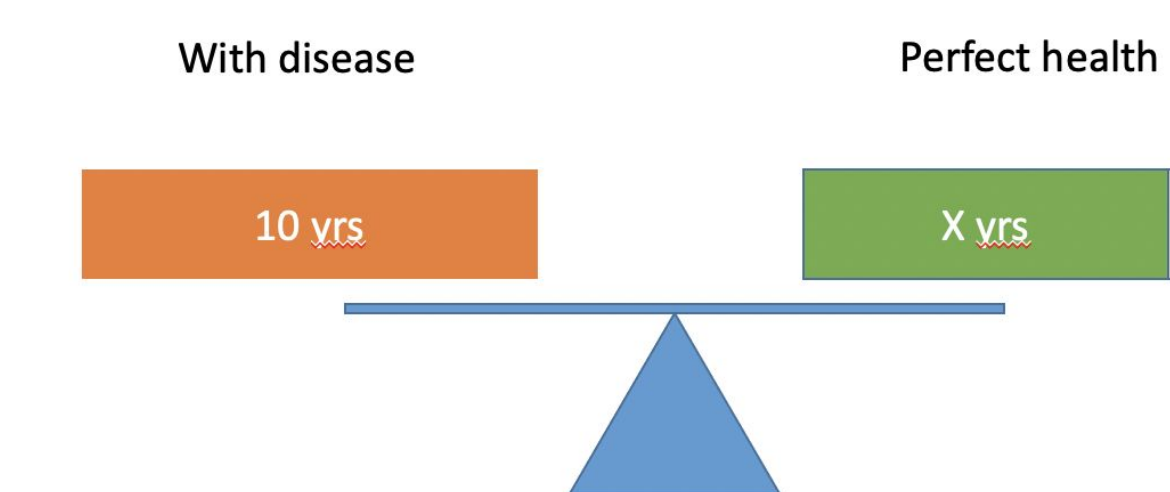
What is  $x$ ?

For:

- HTN
- Dialysis
- HIV

Tips:

- Linear approach
- Bouncing approach



### 60-year old with acute myocardial infarction

	Cost	Mortality	$\Delta$ Cost/ $\Delta$ Lives	$\Delta$ Cost/ $\Delta$ Life Years
No Treatment	\$0	0.077	---	---
Streptokinase	\$200	0.055	\$9,100 <sup>b</sup>	\$1,300
r-tPA <sup>a</sup>	\$2,000	0.0495	\$327,000 <sup>c</sup>	\$47,400

### References

Blair, Irene V et al. "Unconscious (implicit) bias and health disparities: where do we go from here?." *The Permanente journal* vol. 15,2 (2011): 71-8.

Chapman, Elizabeth N et al. "Physicians and implicit bias: how doctors may unwittingly perpetuate health care disparities." *Journal of general internal medicine* vol. 28,11 (2013): 1504-10.

doi:10.1007/s11606-013-2441-1

### HOSPITAL ADMISSIONS



"For your hospital gown, do you prefer paper or plastic?"