



# **A Comprehensive Approach to the Measurement of Health Outcomes**

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K30 Module 2: Gonda Building 1357

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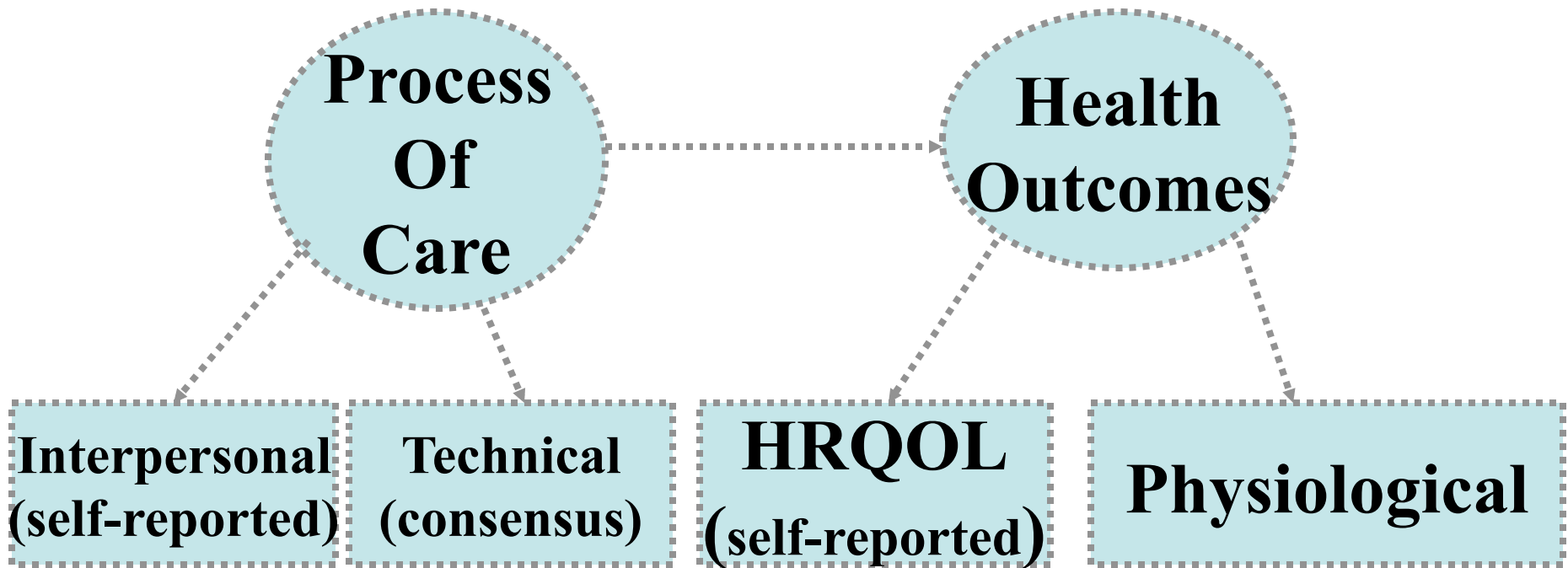
# Recent HRQOL Publications

- ✓ Urology. 2009 Jul 7. [Epub ahead of print], **Responsiveness of the University of California-Los Angeles Prostate Cancer Index.** [Bergman J](#), [Saigal CS](#), [Kwan L](#), [Litwin MS](#).
- ✓ J Rheumatol. 2009 Oct;36(10):2356-61. **Measures of response in clinical trials of systemic sclerosis: The combined response index for systemic sclerosis (CRISS) and Outcome Measures in Pulmonary Arterial Hypertension related to Systemic Sclerosis (EPOSS).** [Khanna D et al](#).
- ✓ J Natl Cancer Inst. 2009 Jun 16;101(12):860-8. Epub 2009 Jun 9. **Impact of cancer on health-related quality of life of older Americans.** [Reeve BB](#), [Potosky AL](#), [Smith AW](#), [Han PK](#), [Hays RD](#), [Davis WW](#), [Arora NK](#), [Haffer SC](#), [Clauser SB](#).

# Recent HRQOL Publications

- ✓ Arch Intern Med. 2009 Jun 22;169(12):1104-12. **The impact of selecting a high hemoglobin target level on health-related quality of life for patients with chronic kidney disease: a systematic review and meta-analysis.** [Clement FM et al.](#)
- ✓ N Engl J Med. 2009 Feb 19;360(8):774-83. **Quality of life after late invasive therapy for occluded arteries.** [Mark DB](#), [Pan W](#), [Clapp-Channing NE](#), [Anstrom KJ](#), [Ross JR](#), [Fox RS](#), [Devlin GP](#), [Martin CE](#), [Adlbrecht C](#), [Cowper PA](#), [Ray LD](#), [Cohen EA](#), [Lamas GA](#), [Hochman JS](#); [Occluded Artery Trial Investigators.](#)

# Patient-Reported Outcomes (PROs)

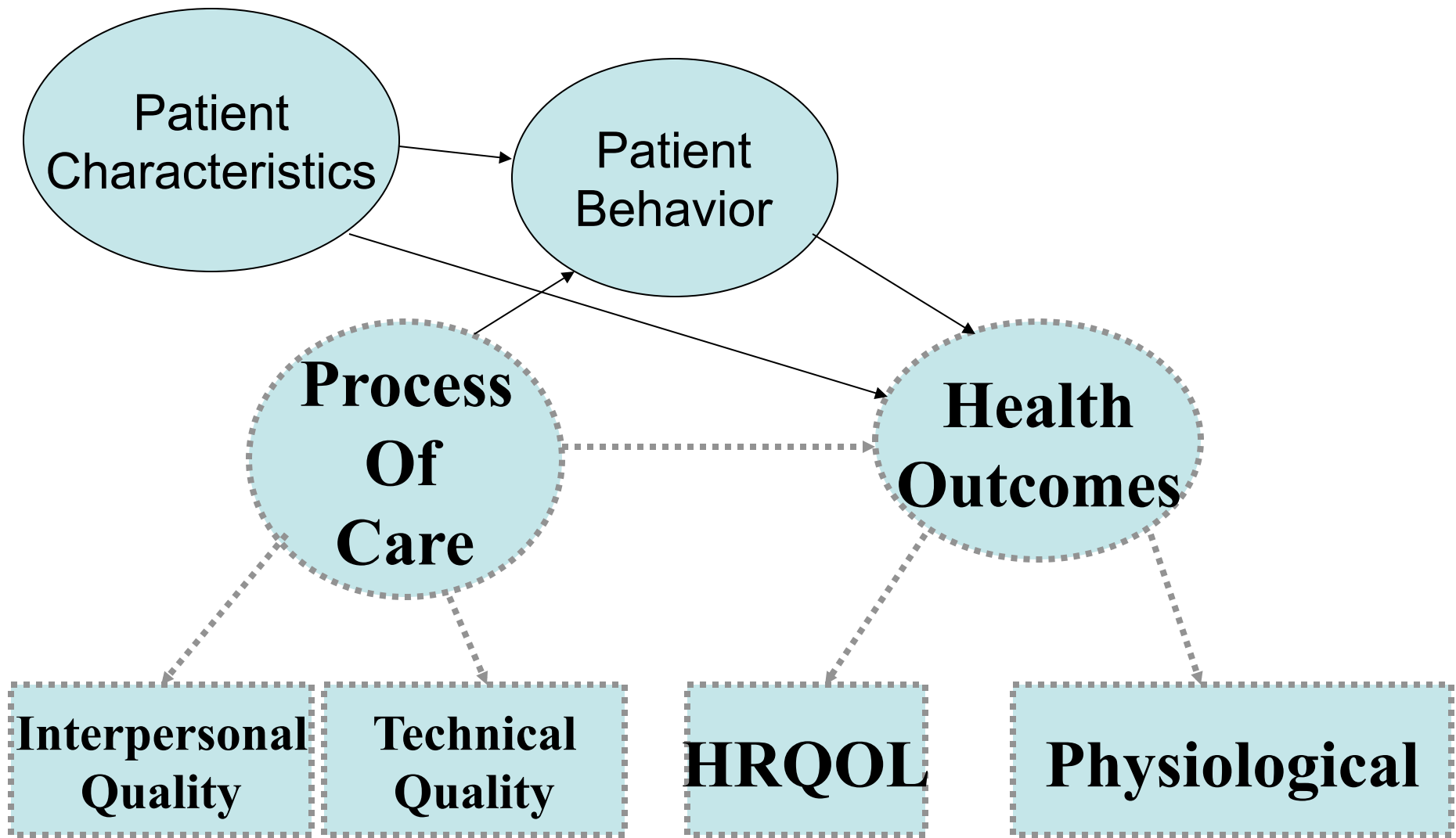


# Process of Care

- Technical Quality (expert consensus)
  - Quality of Care “If Then” Indicators
    - % of patients with diabetes with one or more HbA1c tests annually
- Interpersonal Quality (patient-reported)
  - In the last 12 months, how often did your doctor explain things in a way that was easy to understand?

# Health Outcomes

- Physiological
  - % of patients with diabetes with most recent HbA1c level >9.0% ( poor control)
- HRQOL
  - In general, would you say that your health is:
    - Excellent
    - Very good
    - Good
    - Fair
    - Poor



# Health Services Research

## 2008 Eisenberg Award

Adobe Acrobat Professional - [Kahn et al HSR 2007.pdf]

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DOI: 10.1111/j.1475-6773.2006.00604.x

### Does Ambulatory Process of Care Predict Health-Related Quality of Life Outcomes for Patients with Chronic Disease?

*Katherine L. Kahn, Diana M. Tisnado, John L. Adams, Honghu Liu, Wen-Pin Chen, Fang Ashlee Hu, Carol M. Mangione, Ronald D. Hays, and Cheryl L. Damberg*

**Objective.** The validity of quality of care measurement has important implications for practicing clinicians, their patients, and all involved with health care delivery. We used empirical data from managed care patients enrolled in west coast physician organizations to test the hypothesis that observed changes in health-related quality of life across a



In general, how would you  
rate your health?

Poor

Fair

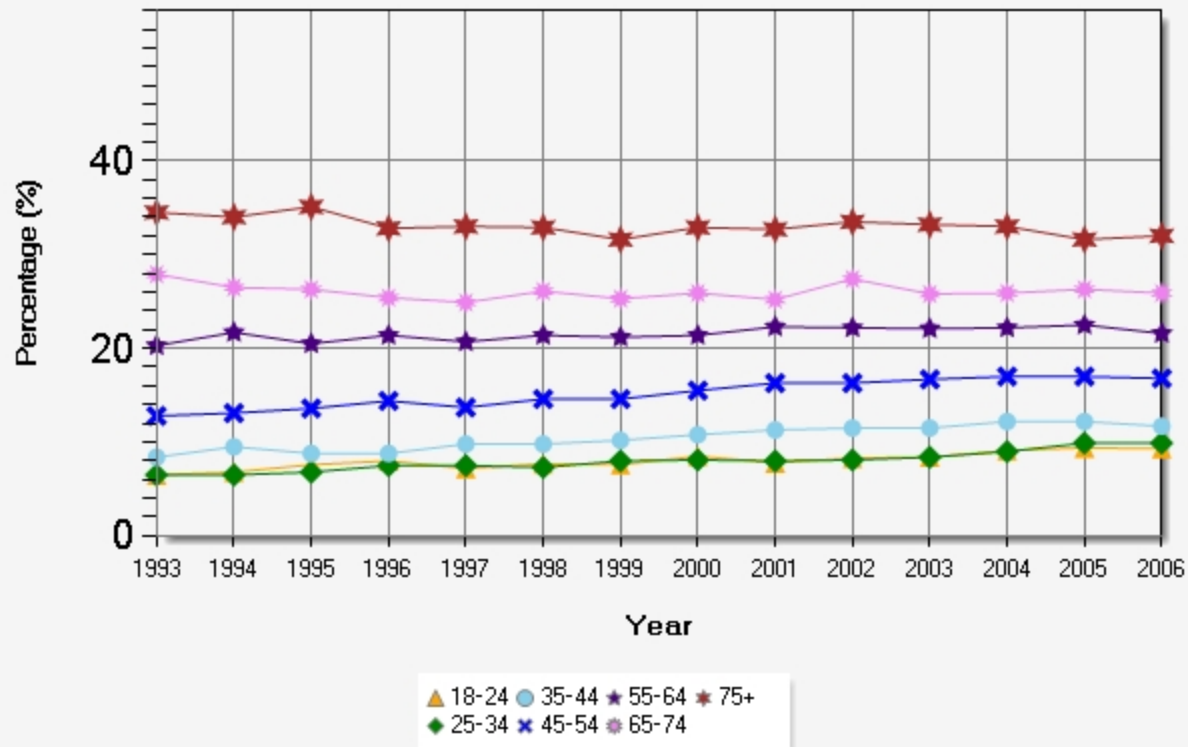
Good

Very Good

Excellent

## Percentage with fair or poor self-rated health

Nationwide trend: Age Group



**Greater % of fair or poor health reported  
by older adults (33% for 75+ versus 9% for 18-34)**

# Health-Related Quality of Life is:

- How the person FEELS (well-being)
  - Emotional well-being
  - Pain
  - Energy
- What the person can DO (functioning)
  - Self-care
  - Role
  - Social

# HRQOL is Not

- Quality of environment
- Type of housing
- Level of income
- Social Support



# How much of the time during the past 4 weeks have you been happy?

*None of the time*

*A little of the time*

*Some of the time*

*Most of the time*

*All of the time*



# Does your health now limit you in walking more than a mile?

(If so, how much?)

*No, not limited at all*

*Yes, limited a little*

*Yes, limited a lot*



# 0-100 Scoring of HRQOL Scales

Average or sum all items in the same scale.

0 (worst) to 100 (best) possible range (linear)  
transformation

$$X_{0-100} = \frac{(\text{original score} - \text{minimum}) * 100}{(\text{maximum} - \text{minimum})}$$

**The following items are about activities you might do during a typical day. Does your health now limit you in these activities? If so, how much?**

1. Yes, limited a lot -----> 0
2. Yes, limited a little ----> 50
3. No, not limited at all -->100

1. Vigorous activities, such as running, lifting heavy objects, participating in strenuous sports
2. Moderate activities, such as moving a table, pushing a vacuum cleaner, bowling, or playing golf
3. Lifting or carrying groceries
4. Climbing several flights of stairs
5. Climbing one flight of stairs
6. Bending, kneeling, or stooping
7. Walking more than a mile
8. Walking several blocks
9. Walking one block
10. Bathing or dressing yourself



# Change in Physical Functioning

*My score right now = 100*

## Event #1 (Hit by Rock):

- Leads me to being *limited a little* in vigorous activities
- Post-intervention score: 95 ( - 0.25 SD)

## Event #2 (Hit by Bike):

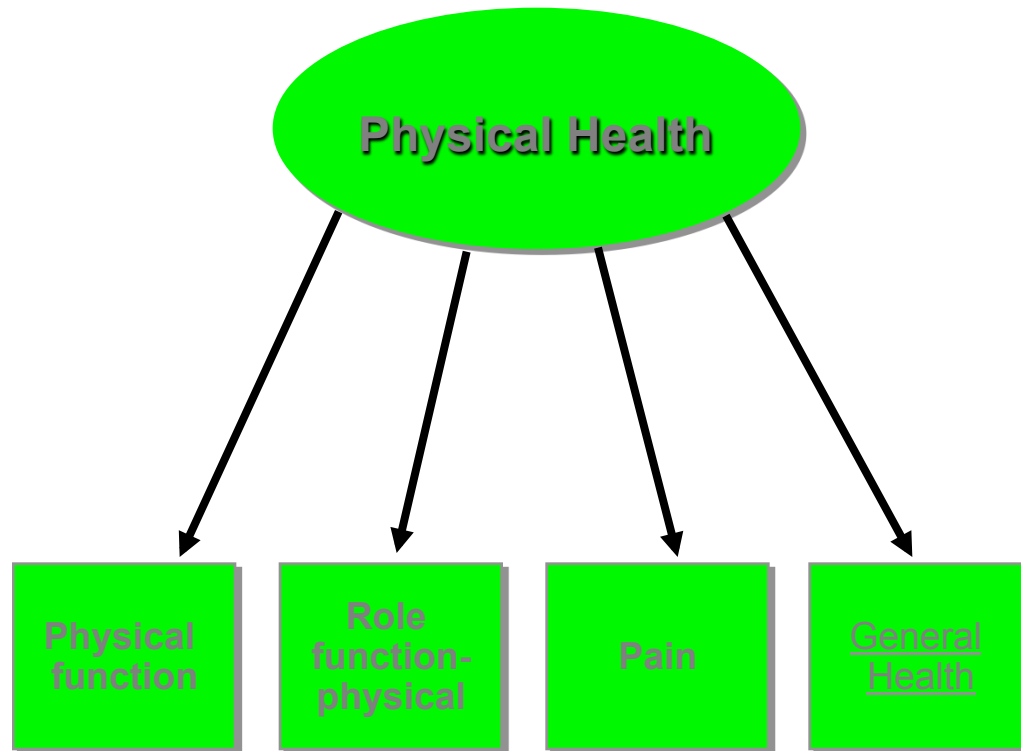
- Leads me to being:
  - *limited a lot* in vigorous activities and in climbing several flights of stairs
  - *limited a little* in moderate activities
- Post-intervention score: 75 (- 1.25 SD)

Mean = 87 (SD = 20)  
50th percentile = 95 (U.S. males)

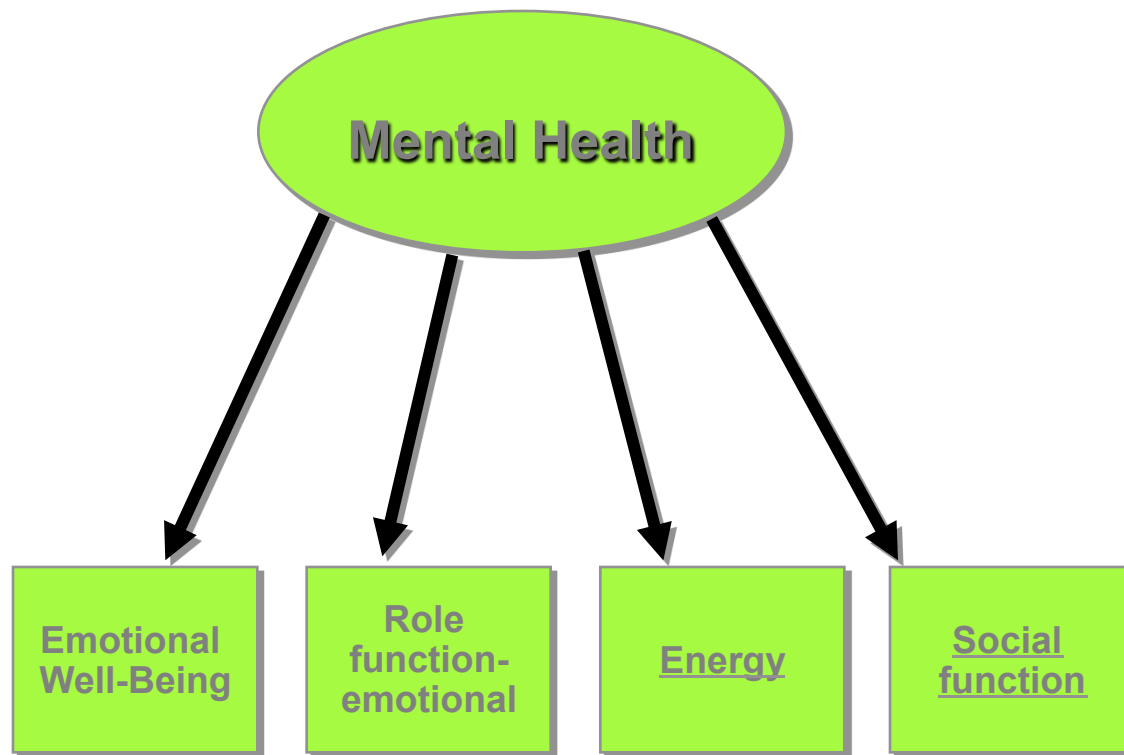
# SF-36 Generic Profile Measure

- Physical functioning (10 items)
- Role limitations/physical (4 items)
- Role limitations/emotional (3 items)
- Social functioning (2 items)
- Emotional well-being (5 items)
- Energy/fatigue (4 items)
- Pain (2 items)
- General health perceptions (5 items)

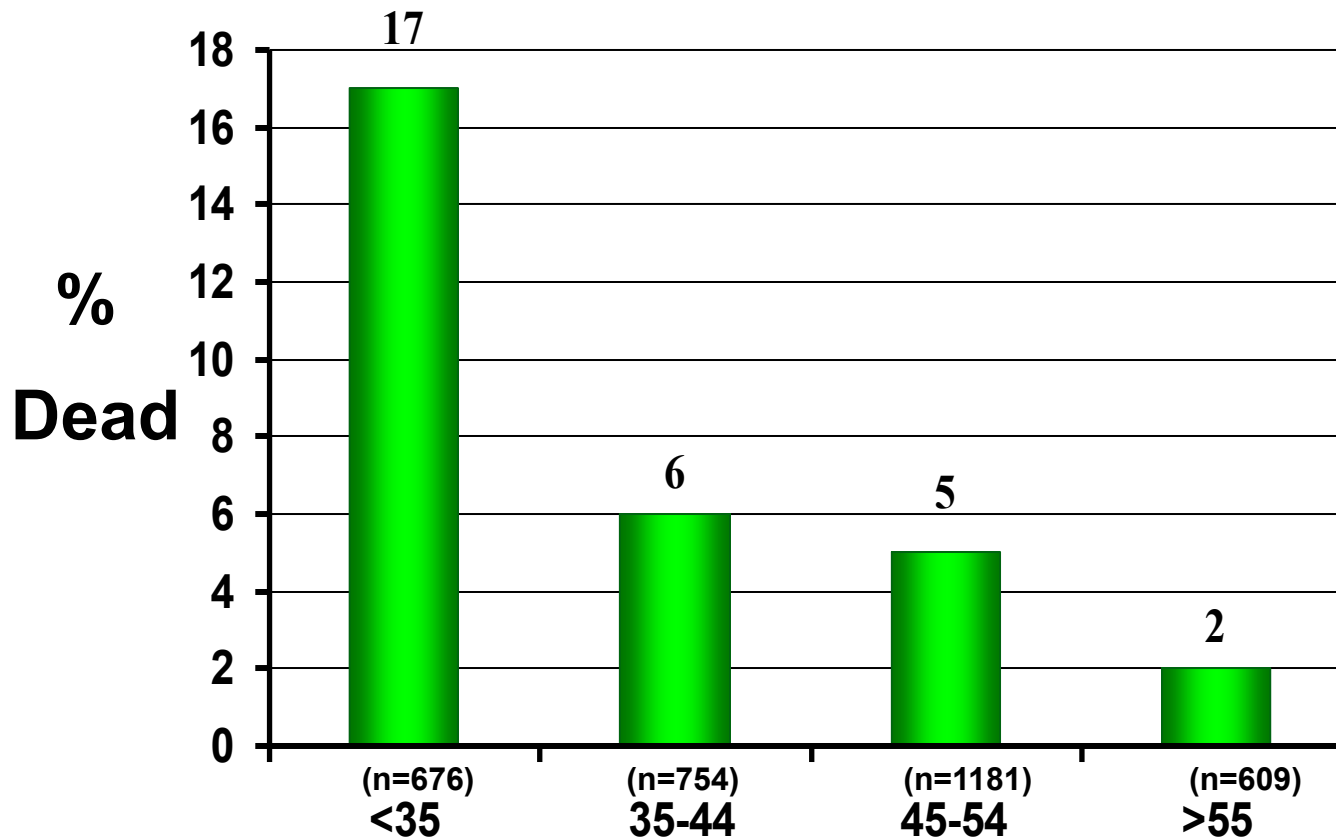
# SF-36 Physical Health



# SF-36 Mental Health



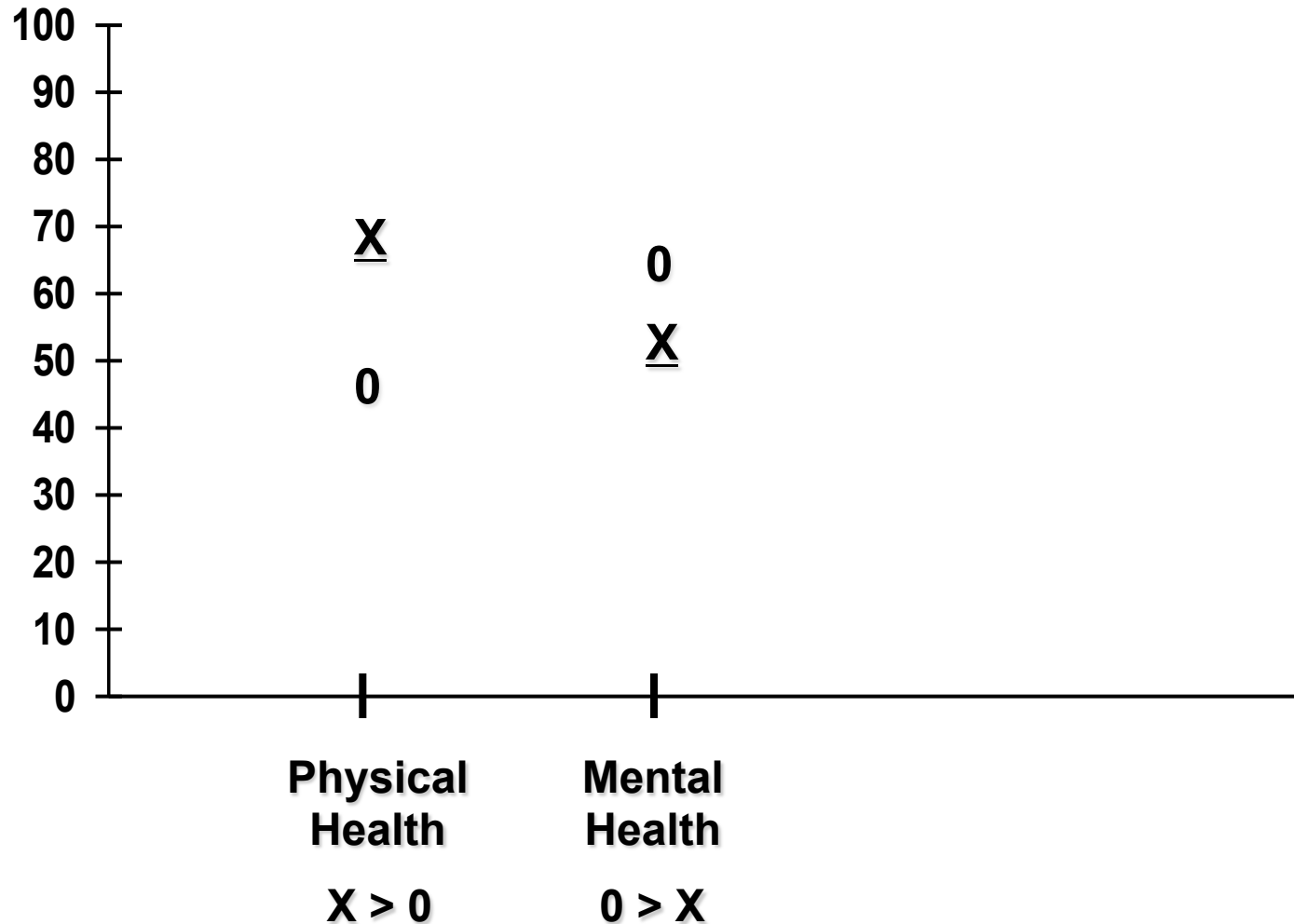
# Self-Reported Physical Health Predictive of 5-Year Mortality



**SF-36 Physical Health Component Score (PCS)—T score**

Ware et al. (1994). SF-36 Physical and Mental Health Summary Scales: A User's Manual.

# Is New Treatment (X) Better Than Standard Care (O)?



# Medicine and HRQOL?

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Person	Medicine Use	HRQOL (0-100 scale)
1	No	dead
2	No	dead
3	No	50
4	No	75
5	No	100
6	Yes	0
7	Yes	25
8	Yes	50
9	Yes	75
10	Yes	100

# Medicine and HRQOL?

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Person	Medication Use	HRQOL (0-100 scale)
1	No	dead
2	No	dead
3	No	50
4	No	75
5	No	100

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Group	n	HRQOL
No Medicine	3	75



# Medicine Use Diminishes HRQOL?

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Person	Medication Use	HRQOL (0-100 scale)
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6	Yes	0
7	Yes	25
8	Yes	50
9	Yes	75
10	Yes	100

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Group	n	HRQOL
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Yes Medicine	5	50
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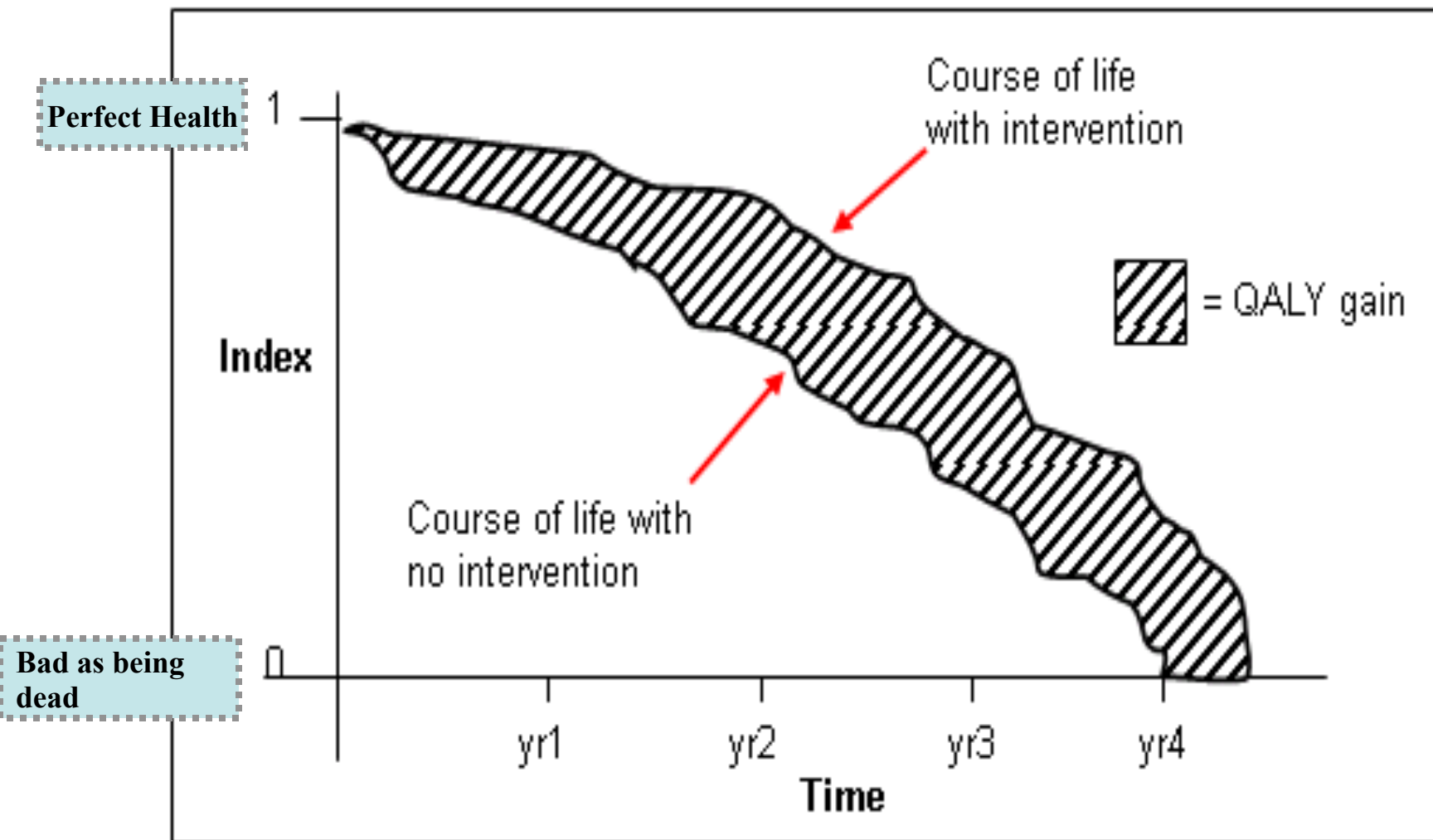
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5	No	100
6	Yes	0
7	Yes	25
8	Yes	50
9	Yes	75
10	Yes	100

Group	n	HRQOL
No Medicine	3	<u>75</u>
Yes Medicine	5	50

# Preference-based HRQOL Measure Yields Summary Score



# Preference-Based Measures Used for Cost-Utility Analyses

Cost ☐

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Effectiveness ☐

# Quality of Life after Late Invasive Therapy for Occluded Arteries

- Patients with totally occluded infarct-related artery 3-28 days after MI
- Randomized to:
  - Medical therapy alone (n = 474)
  - Percutaneous coronary intervention (PCI) plus stenting (n = 477)
- Primary outcome—composite of death, reinfarction, or hospital treatment for class IV heart failure

# Health-Related Quality of Life Outcome Measures (Baseline, 4, 12 & 24 months)

- Duke Activity Status Index (DASI)
- SF-36 Mental Health Scale (MHI-5)
- Time tradeoff (TTO)

N Engl J Med. 2009 Feb 19;360(8):774-83

# DASI

- Self-administered questionnaire measuring physical functioning (designed to estimate peak oxygen uptake).
  - Can you run a short distance?
  - Can you do yard work like raking leaves weeding or pushing a power mower?
- 0-58 score range (higher is better),  
>=4 is “clinically significant”

# MHI-5

- How much of the time during the past 4 weeks:
  - Have you been a very nervous person?
  - Have you felt so down in the dumps that nothing could cheer you up?
  - Have you felt calm and peaceful?
  - Have you felt down-hearted and blue?
  - Have you been a happy person?
- 0-100 score range (higher is better),  
>=5 is “clinically significant”



# Cardiac Symptoms

- Rose
  - Angina questionnaire (7 questions)
    - Chest pain and whether provoked by walking and relieved by rest
  - Dyspnea questionnaire (4 questions)

# TTO

Choice #1: Your present state

Life Expectancy: 10 years

Choice #2: Excellent health

How many years (x) would you give up in your current state to be able to have complete mobility?

$$\left[ 1 - \frac{x}{10} = \text{QALY} \right]$$

# TTO Estimates

How many years (x) would you give up in your current state to be able to have excellent health?

$$X = 0 \rightarrow QALY = 1$$

$$X = 1 \rightarrow QALY = 0.9$$

$$X = 5 \rightarrow QALY = 0.5$$

$$X = 10 \rightarrow QALY = 0$$

$$\left[ 1 - \frac{X}{10} = QALY \right]$$

# Results & Conclusions

- 2-year net cost was \$7,089 for PCI
- DASI at 4 months
  - PCI (37) versus Medical therapy (33)
- 2-year QALYs
  - 1.42 vs. 1.45 for PCI and Medical therapy

*Does not support common practice of routine PCI in patients in stable condition after MI with occluded infarct-related artery.*

Thank you.

