

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

**Ron D. Hays, Ph.D.  
UCLA GIM & HSR**

**October 22, 2003 (4:00-5:30 pm)**

**MacDonald Research Building, 1-441**

**©Course materials copyrighted 2003 by Ron D. Hays**

# First RCT of Treatment for Newly Diagnosed Prostate Cancer

## Radical prostatectomy vs. watchful waiting

- Concealed randomization; blinded adjudication of outcomes

## Prostatectomy

- trend to reduced all-cause mortality

(18% versus 15%; RR 0.83, 0.57 to 1.2,  $p = 0.31$ )

NEJM, 2002, 347

# Impact of Treatment

## Sexual dysfunction

- 45% waiting, 80% prostatectomy

## Urinary leakage

- 21% waiting, 49% prostatectomy

## Urinary obstruction (weak stream)

- 44% waiting, 28% prostatectomy

No differences in bowel function, anxiety, depression, and well being.

# **With more doctors and better technology, we are able to detect more disease**

**Number of cardiologists has doubled; number of radiologists increased 5-fold in past 2 decades**

**New spiral CT scans can detect hepatic lesions of 2mm. In 1982, only 20mm lesions could be detected.**

**MRI can ...**

**detect abnormalities of the knee in 25% of healthy young men.**

**find lumbar disc bulge in 50% of adults, many who report no back pain.**

# Access to Cost-Effective Care

Cost ☐



Effectiveness ☐

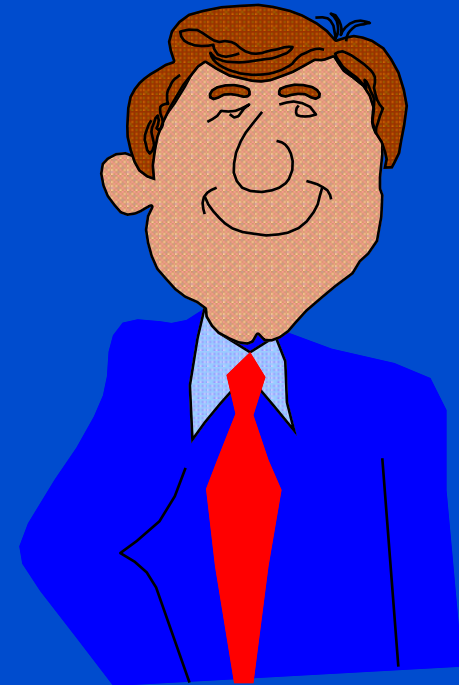
# How is the Patient Doing

## Biological indicators

- Blood pressure
- Hematocrit

## Self-report indicators

- Symptoms
- Functioning
- Well-being



# Health-Related Quality of Life is:

## What the person can DO (functioning)

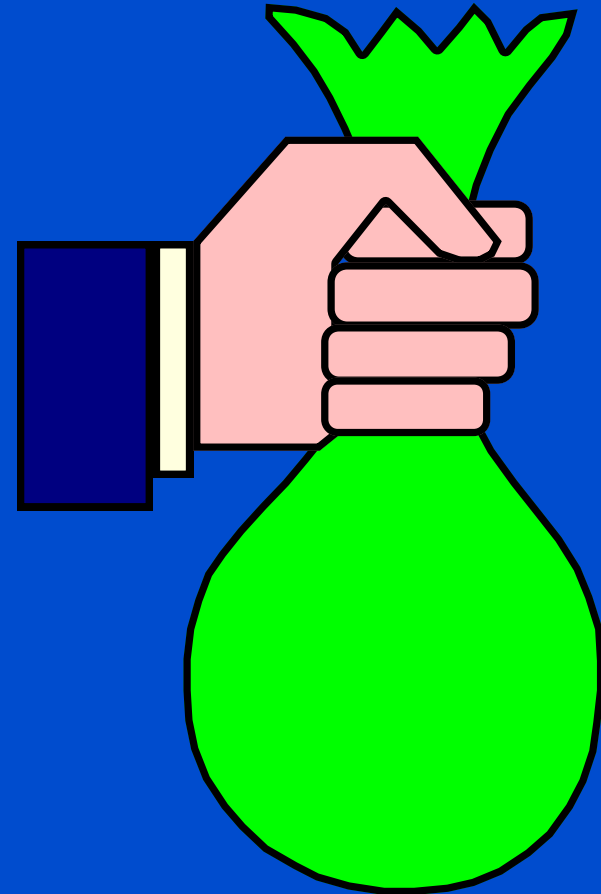
- Self-care
- Role
- Social

## How the person FEELS (well-being)

- Emotional well-being
- Pain
- Energy

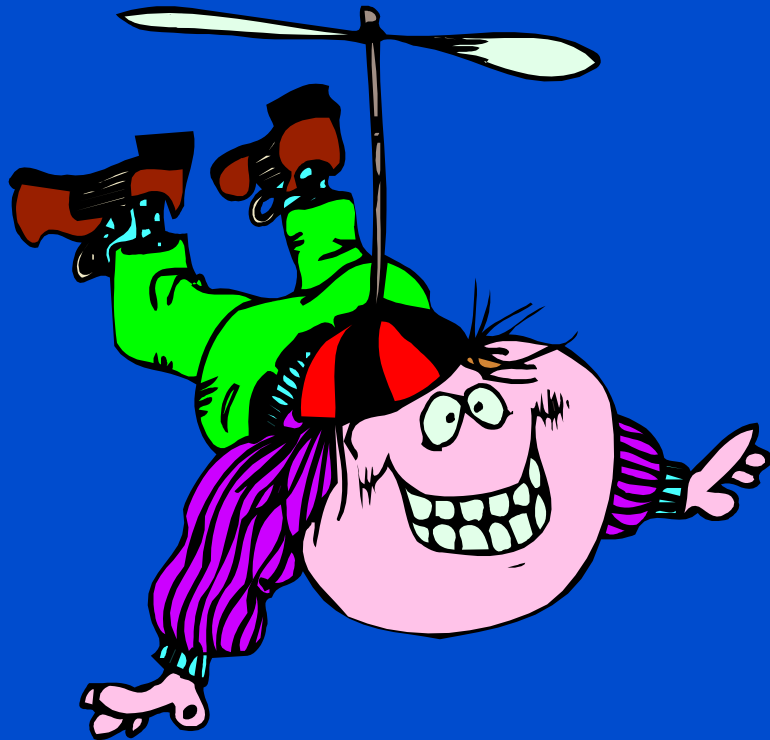
# HRQOL is Not

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





# Types of HRQOL Measures

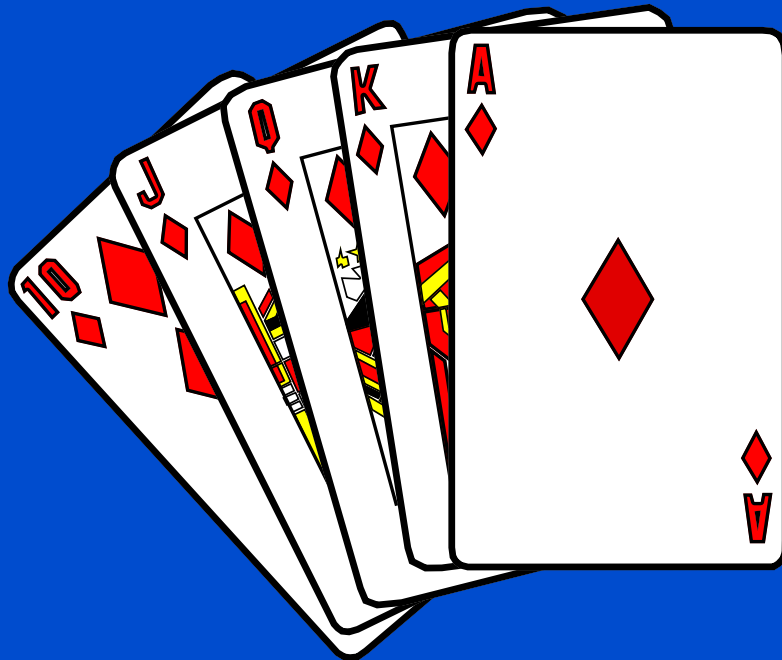


**Generic**

- Profile
- Preference

**Targeted**

# Example Generic HRQOL Item



In general, would you say  
your health is:

*Excellent*

*Very Good*

*Good*

*Fair*

*Poor*

# SF-36 Generic HRQOL Scales

- 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)

# Physical Functioning Item



Does your health now limit you in bathing or dressing yourself?

*Yes, limited a lot*

*Yes, limited a little*

*No, not limited at all*

# Emotional Well-Being Item

How much of the time during  
the past 4 weeks have you  
been very nervous?

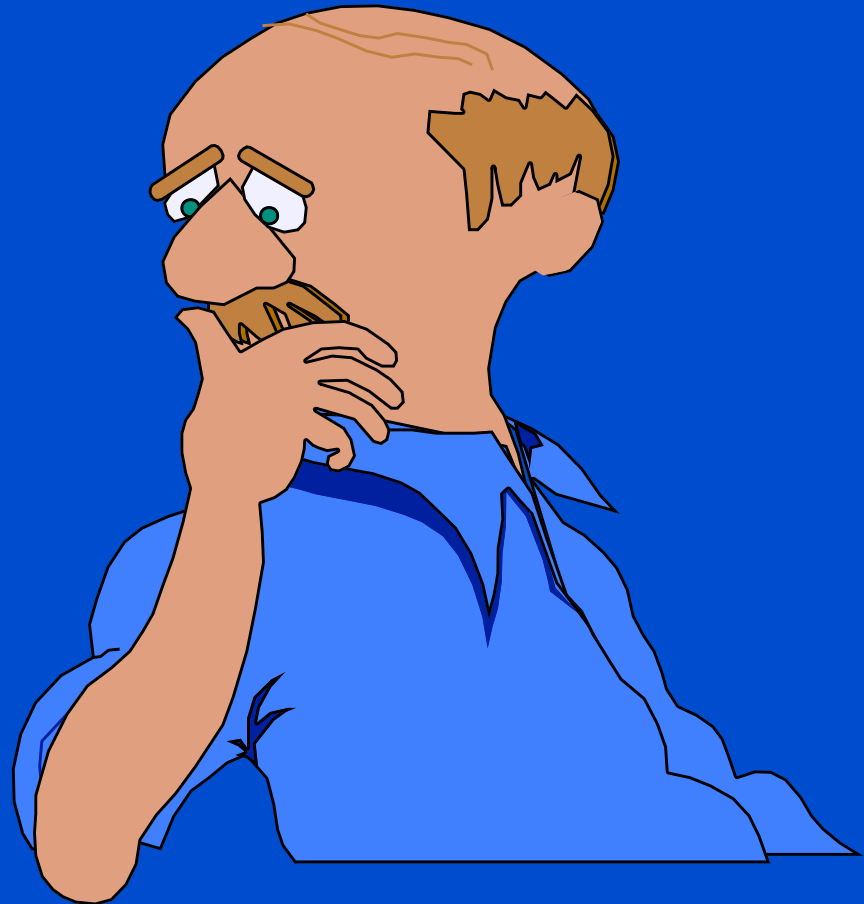
*None of the time*

*A little of the time*

*Some of the time*

*Most of the time*

*All of the time*



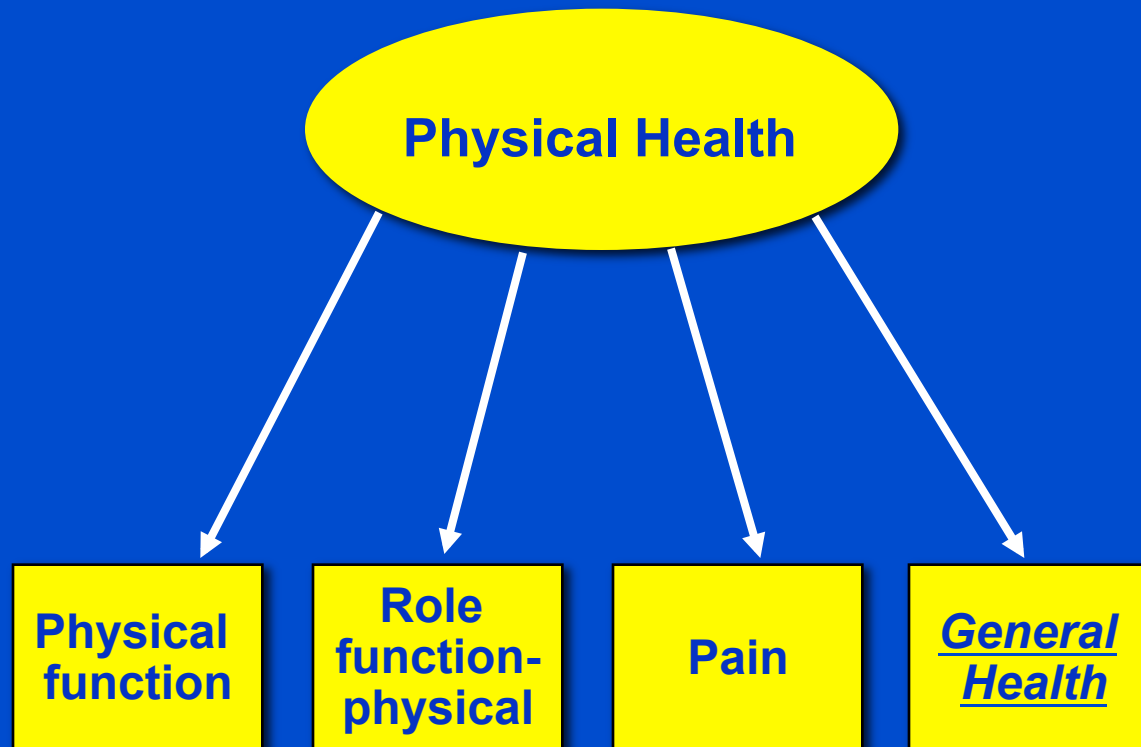
# Scoring Generic HRQOL Scales

Average or sum all items in the same scale.

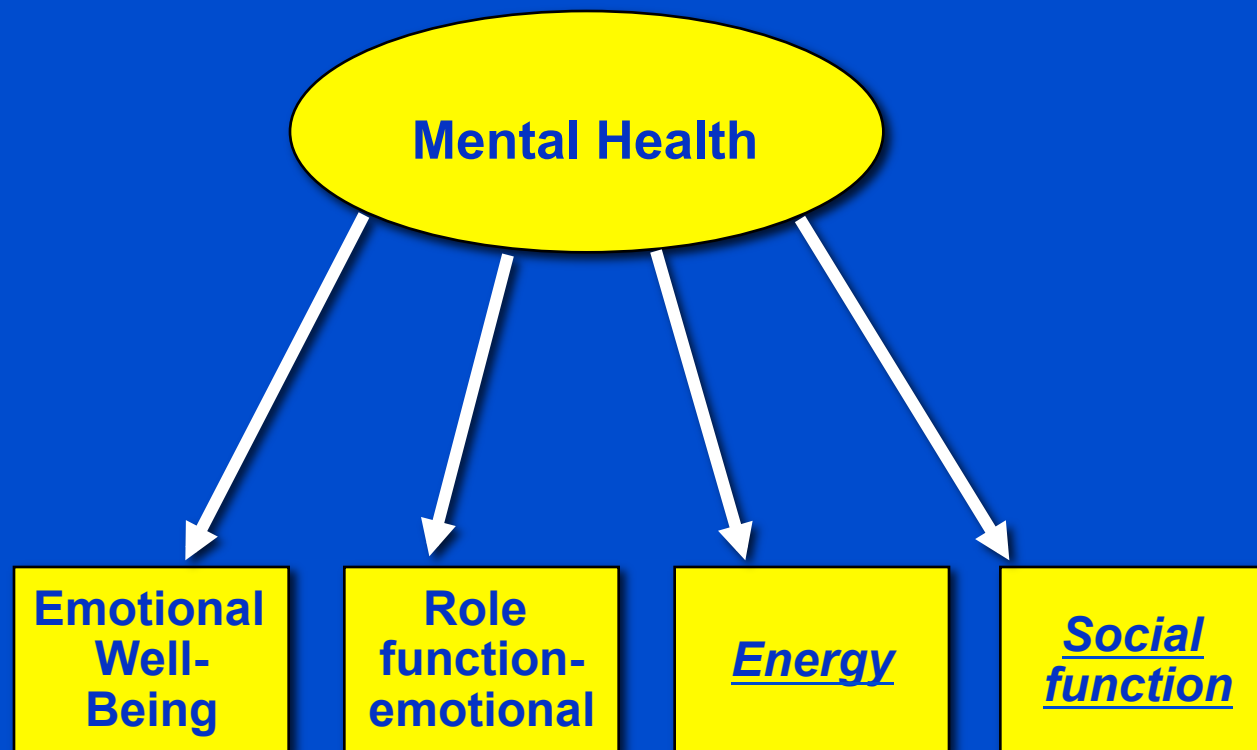
Transform average or sum to

- 0 (worse) to 100 (best) possible range
- z-score (mean = 0, SD = 1)
- T-score (mean = 50, SD = 10)

# Physical Health



# Mental Health





# Example Uses of Generic HRQOL Measures

## Cross-Sectional

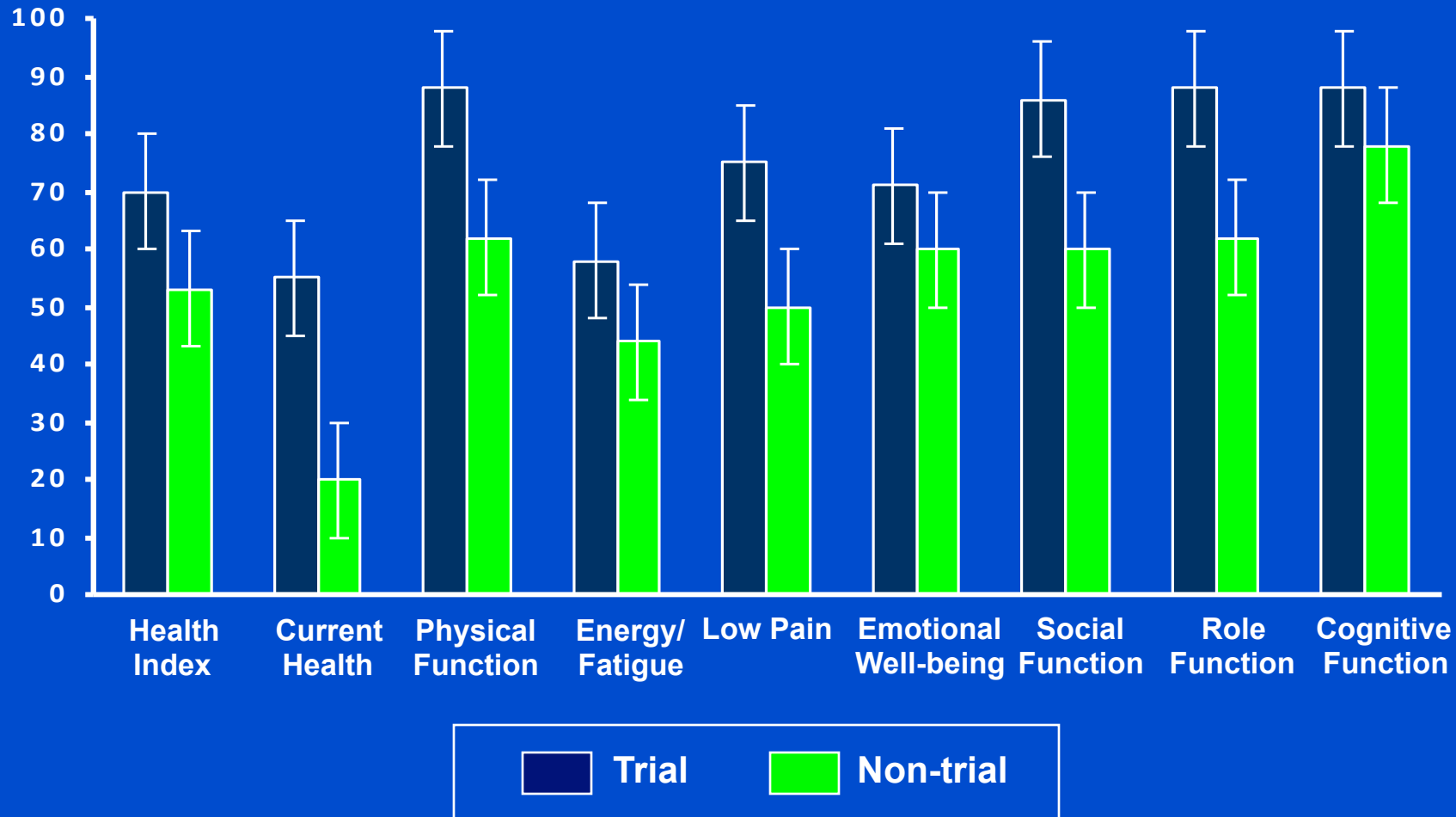
- Comparison of Different Samples
- Profiles of Different Diseases

## Longitudinal

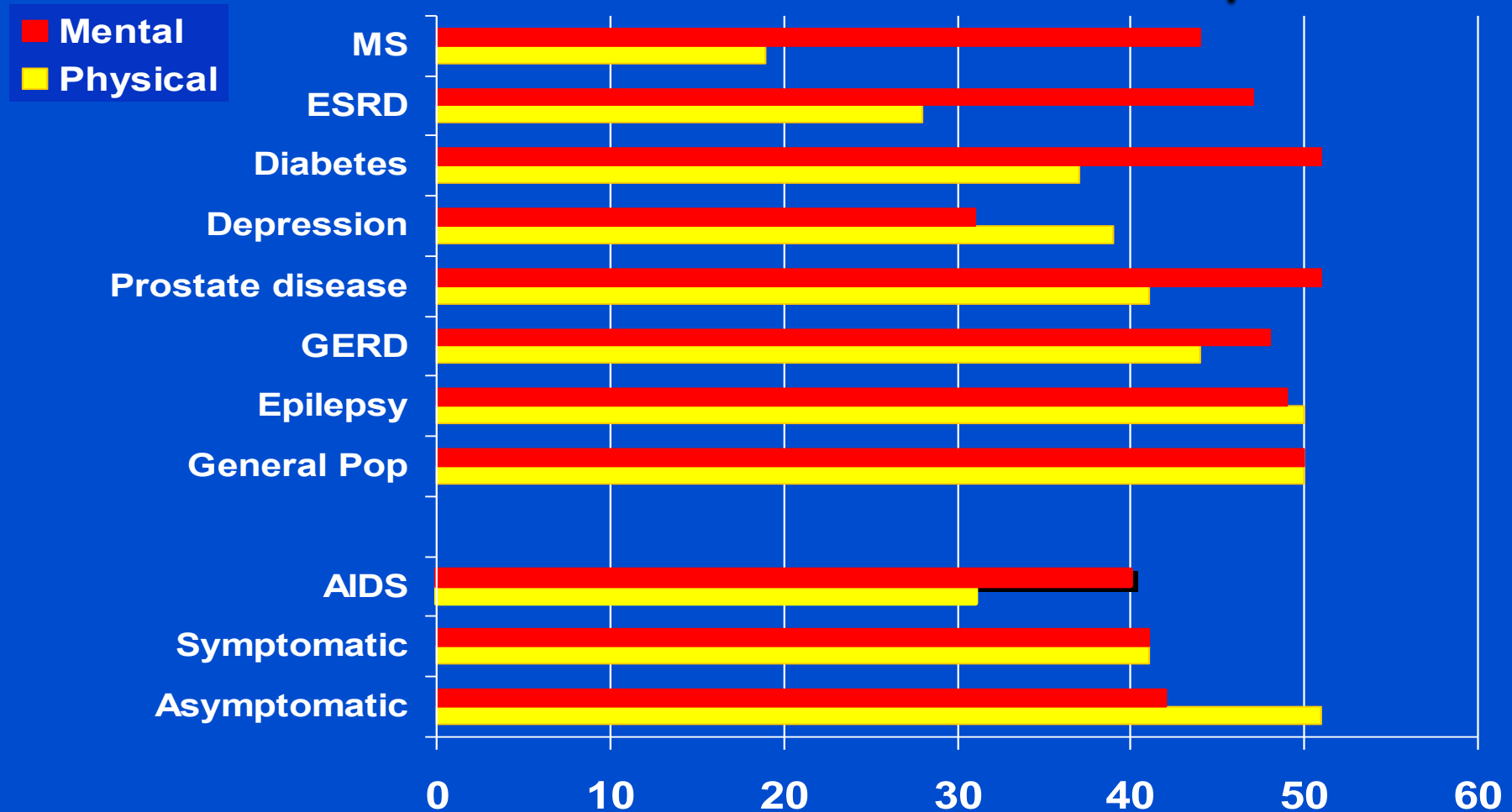
- Profiles of Different Disease
- Exploring HRQOL Antecedents
- Predicting Future Health-Related Events

# HRQOL of Patients in ACTG versus Public Hospital Samples

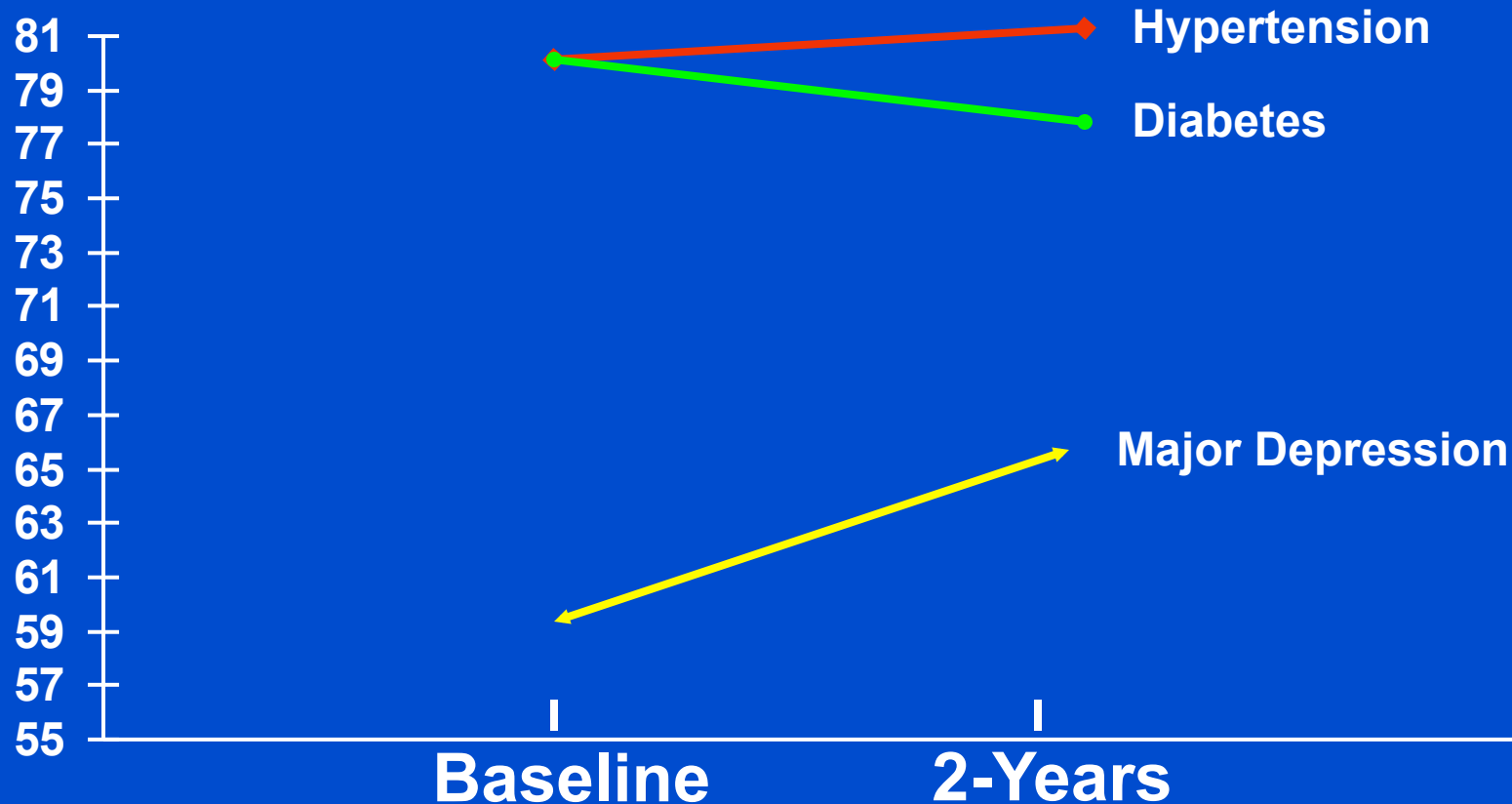
Adjusted Scale Scores (Cunningham et al., 1995)



# HRQOL for HIV Compared to other Chronic Illnesses and General Population

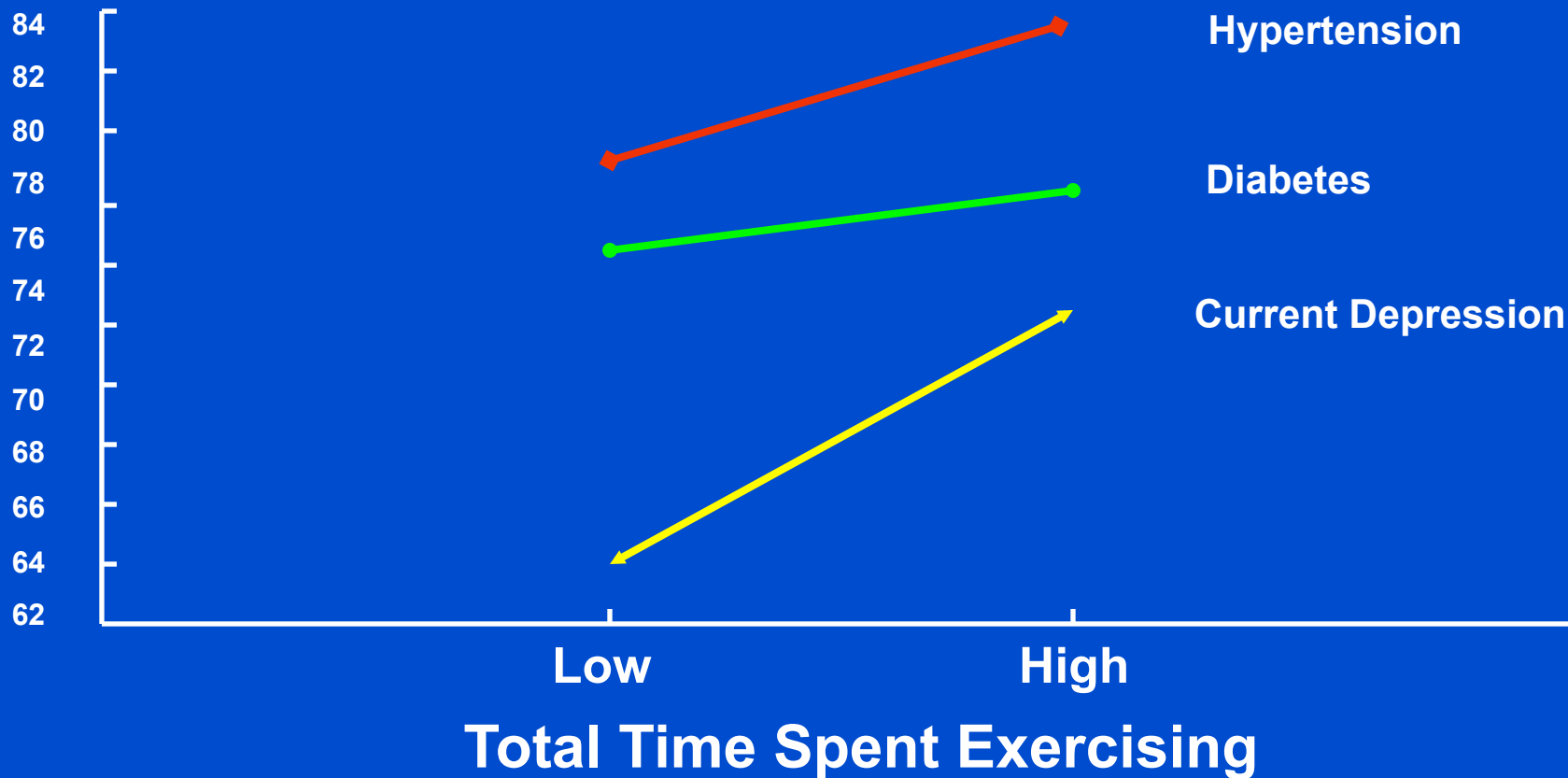


# Course of Emotional Well-being Over 2-years for Patients in the MOS General Medical Sector



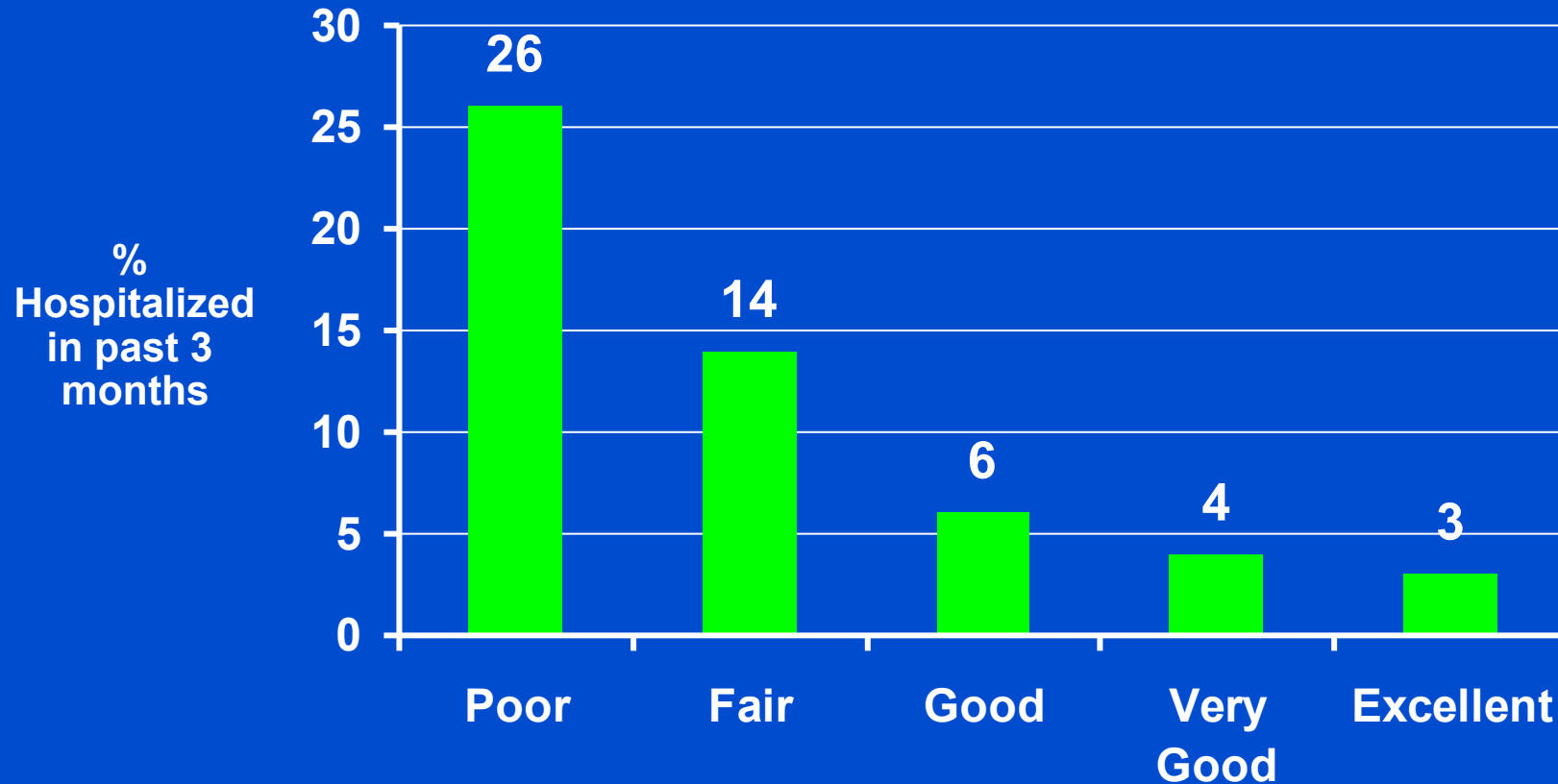
Hays, R.D., Wells, K.B., Sherbourne, C.D., Rogers, W., & Spritzer, K. (1995).  
Functioning and well-being outcomes of patients with depression compared  
to chronic medical illnesses. *Archives of General Psychiatry*, 52, 11-19.

# Physical Functioning in Relation to Time Spent Exercising 2-years Before



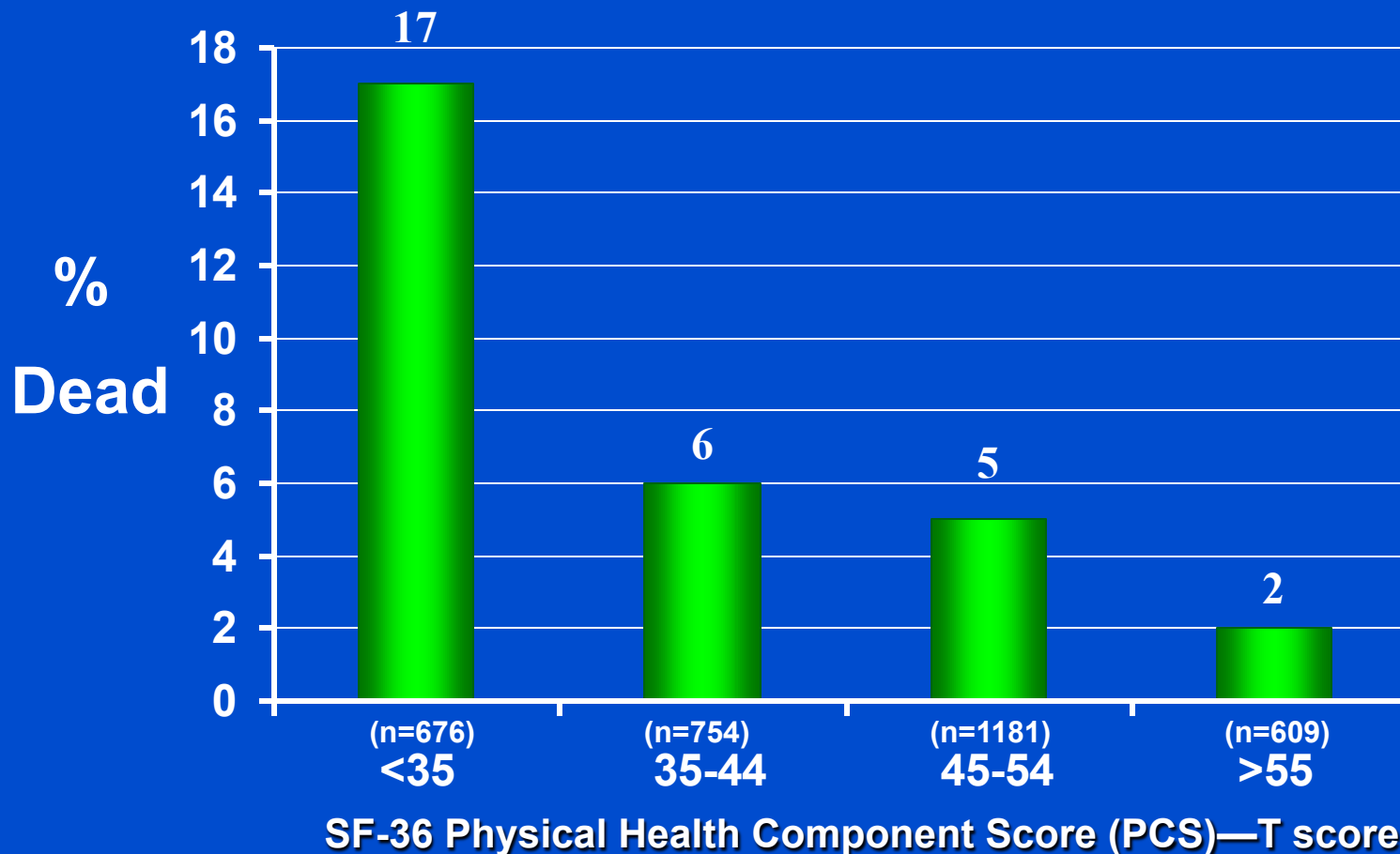
Stewart, A.L., Hays, R.D., Wells, K.B., Rogers, W.H., Spritzer, K.L., & Greenfield, S. (1994). Long-term functioning and well-being outcomes associated with physical activity and exercise in patients with chronic conditions in the Medical Outcomes Study. *Journal of Clinical Epidemiology*, *47*, 719-730.

# Generic Health Ratings Associated with Hospitalizations (N = 20,158)



Kravitz, R. et al. (1992). Differences in the mix of patients among medical specialties and systems of care: Results from the Medical Outcomes Study. *JAMA*, 267, 1617-1623.

# Five-Year Mortality Rates by Levels of Physical Health



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

# Targeted HRQOL Measures

- Designed to be relevant to particular group.
- Sensitive to small, clinically-important changes.
- Important for respondent cooperation.
- More familiar and actionable.



# Kidney-Disease Targeted Items

During the last 30 days, to what extent were you bothered by each of the following?

- Cramps during dialysis
- Washed out or drained

*Not at all bothered*

*Somewhat bothered*

*Moderately bothered*

*Very much bothered*

*Extremely bothered*

# IBS-Targeted Item

**During the last 4 weeks, how often were you angry about your irritable bowel syndrome?**

*None of the time*

*A little of the time*

*Some of the time*

*Most of the time*

*All of the time*

# HRQOL in Men Treated for Localized Prostate Cancer

Cross-sectional study of managed care pop.

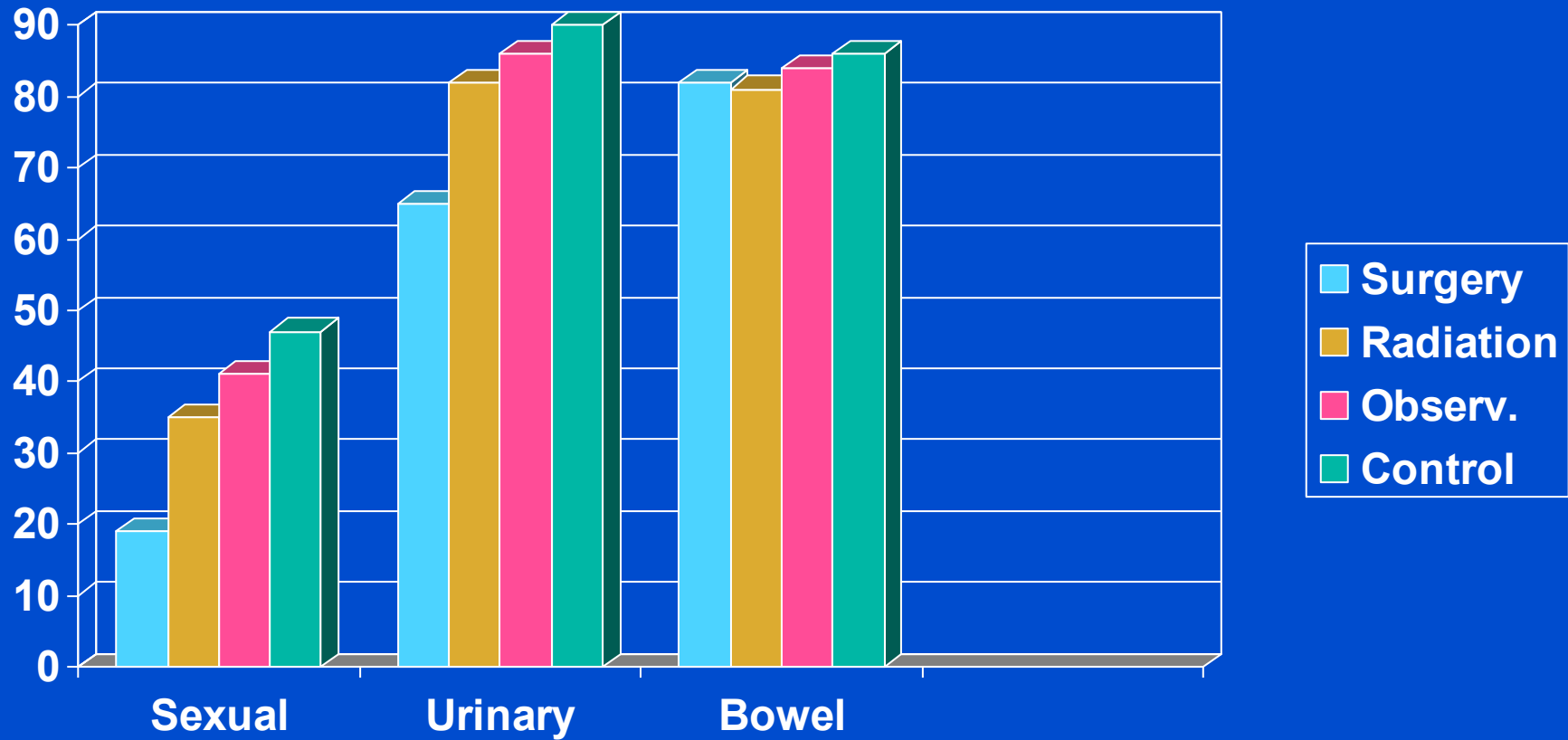
214 men with prostate cancer

- 98 radical prostatectomy
- 56 primary pelvic irradiation
- 60 observation alone

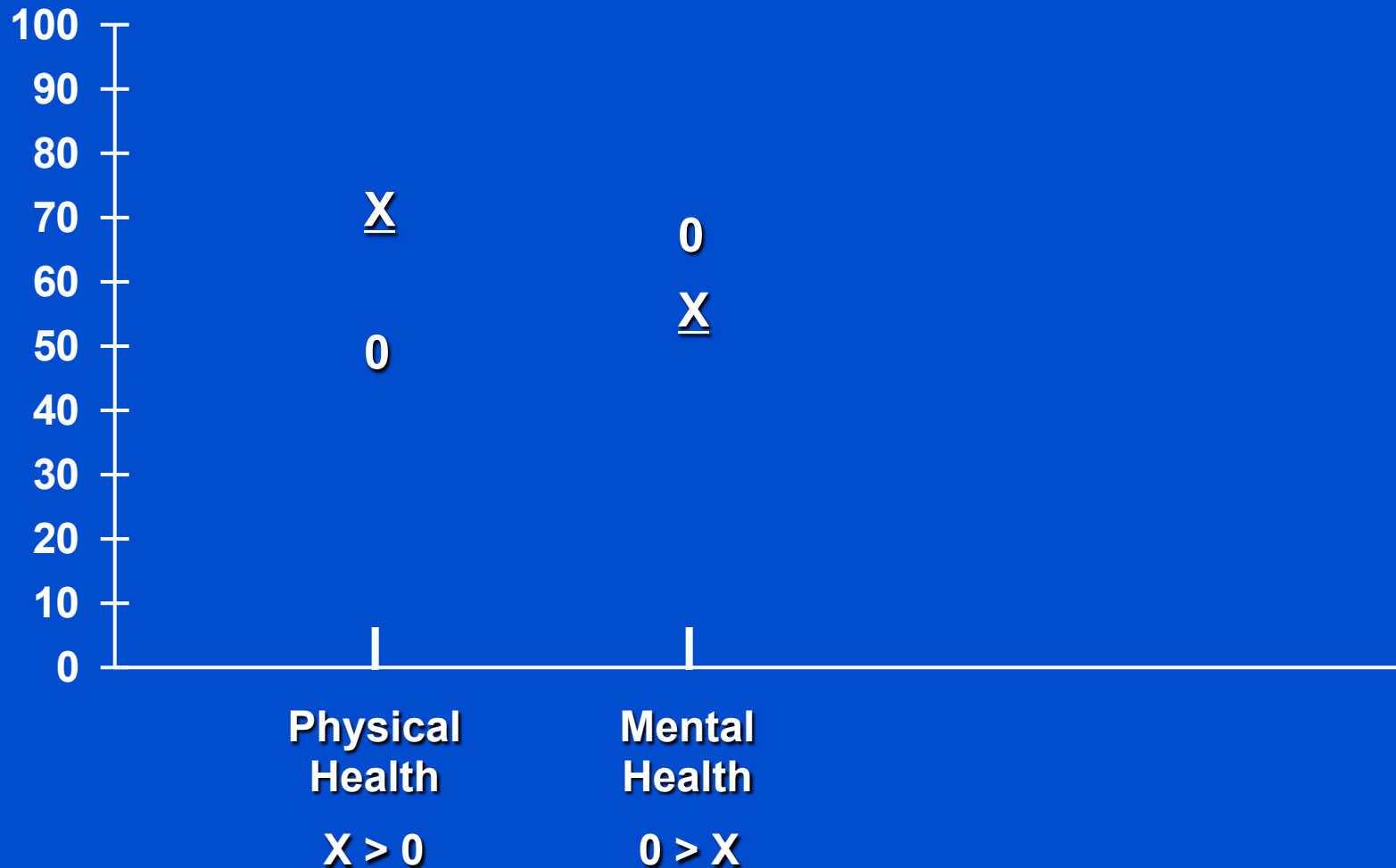
273 age/zip matched pts. without cancer

*Litwin et al. (1995, JAMA)*

# Sexual, Urinary and Bowel Function



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



# Do a Survival Analysis?

Marathoner and person in coma = 1.0



# Brazier et al. SF-6D

- ◆ Brazier et al. (1998, 2002)
  - ◆ 6-dimensional classification
    - ◆ Collapsed role scales, dropped general health
    - ◆ Uses 11 SF-36 items (8 SF-12 and 3 additional physical functioning items)
  - ◆ 18,000 possible states
  - ◆ 249 states rated by sample of 836 from UK general population

# Health State 111111

## Health state 111111

Your health does not limit you in **vigorous activities** (e.g. running, lifting heavy objects, participating in strenuous sports).

You have no problems with your work or other regular daily activities as a result of your **physical health** or **any emotional problems**.

Your health limits your **social activities** (like visiting friends or close relatives) a little or none of the time

You have no **pain**

You feel **tense or downhearted** and low a little or none of the time.

You have a lot of **energy** all of the time



# Questions?

**Resource Centers for  
Minority Aging Research**



This lecture was supported in part by the UCLA/DREW Project EXPORT, National Institutes of Health, National Center on Minority Health & Health Disparities, (P20-MD00148-01) and the UCLA Center for Health Improvement in Minority Elders/Resource Centers for Minority Aging Research, National Institutes of Health, National Institute of Aging, (AG-02-004).

# Appendix: Transforming Scores

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

$$Y = (\text{target SD} * Z_x) + \text{target mean}$$

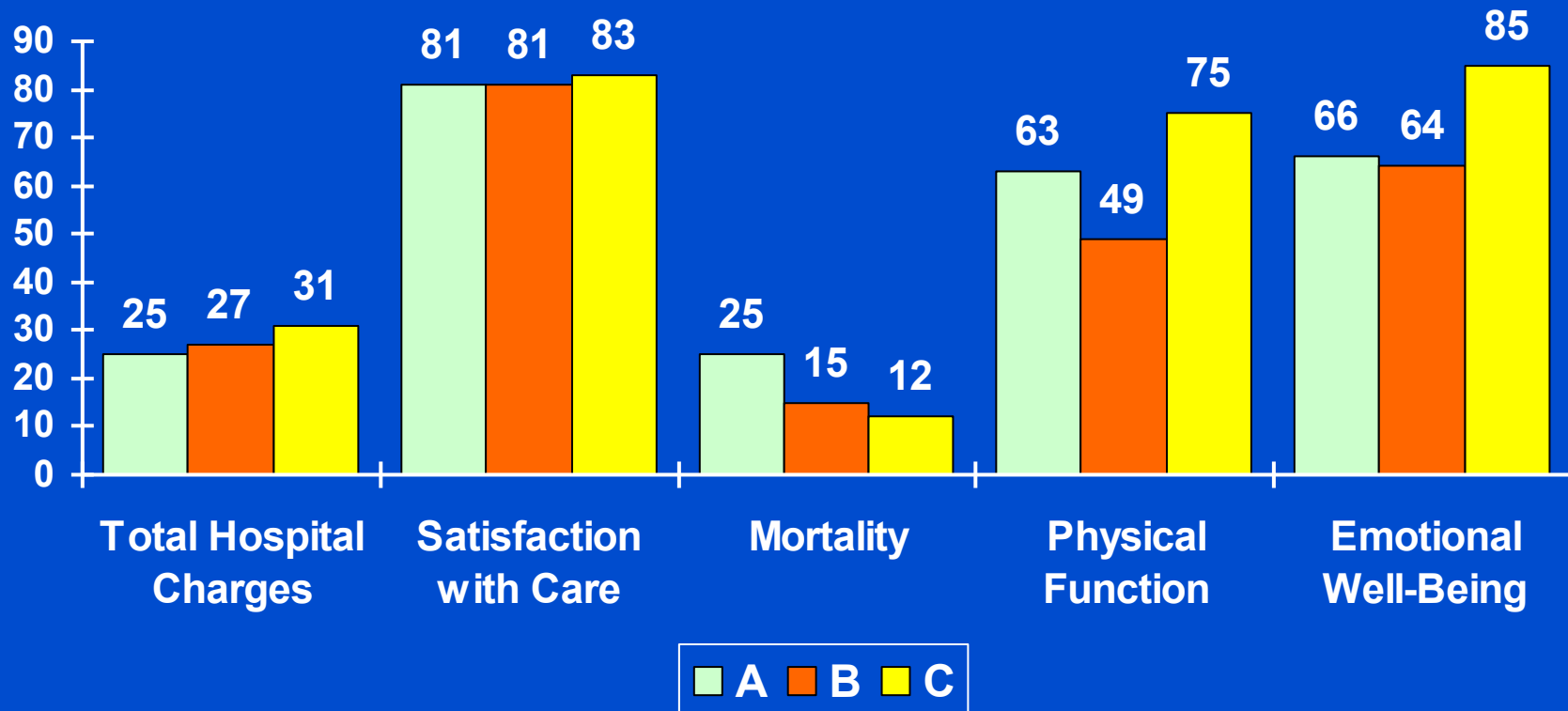
$$Z_x = \frac{(X - \bar{X})}{SD_x}$$

# Appendix: Is Medicine Related to Worse HRQOL?

Person	Medication 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

Group	n	HRQOL
No Medicine	3	75
Yes Medicine	5	50

# Appendix: Profile + Mortality Outcomes for Acute MI (n = 133)

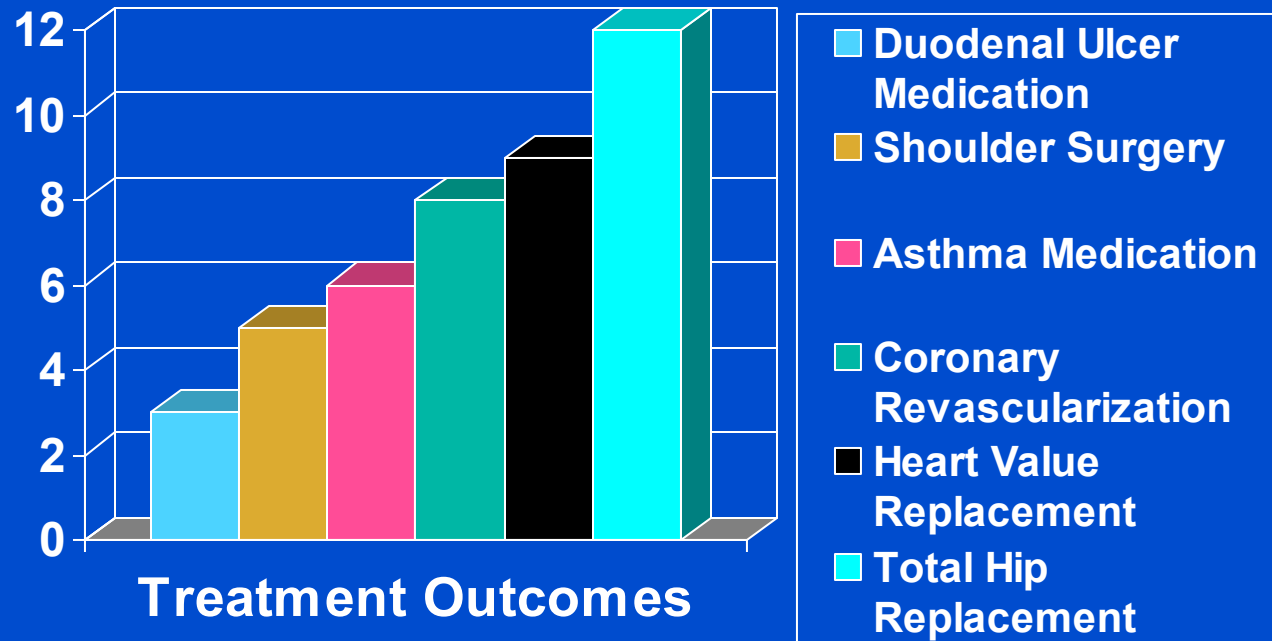


# Appendix: Generic Child Health Measures

Landgraf, J. M., & Abetz, L. N. (1996).  
Measuring health outcomes in pediatric  
populations: Issues in psychometrics and  
application. In B. Spilker (ed.), Quality of life  
and pharmacoeconomics in clinical trials,  
Second edition. Lippincott-Raven Publishers.

# Appendix: Impact on Physical Health

Impact on  
SF-36 PCS



# Appendix: Impact on Mental Health

