

THE IMPORTANCE OF COMORBIDITY DATA TO CANCER STATISTICS AND ROUTINE COLLECTION BY CANCER REGISTRARS COPYRIGHT NOTICE

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*The Importance of Comorbidity
Data to Cancer Statistics and
Routine Collection by Cancer
Registrars*

**Information Forum
Commission on Cancer**

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Introduction

- Patients with cancer often have other diseases, illnesses, or conditions in addition to their index cancer
- These other conditions are generally referred to as *comorbidities*
- Although not a feature of the cancer itself, comorbidity is an important attribute of the patient
- Direct impact on the care of patients, cancer statistics, and the assessment of quality of care

Comorbidity Impact on Therapy

The use of preferred therapy might be contraindicated due to the presence of comorbid ailments

- The comorbid ailment(s) may render an overall prognosis so poor for the patient that an otherwise desirable treatment for the index cancer may be denied
- A particular type of comorbid ailment(s) may affect the patient's ability to tolerate a particular type of therapy

Prostate Cancer Example

- Desch et al studied treatment recommendations for local or regional prostate cancer
- As comorbidity increased, the proportion of men receiving no treatment rose correspondingly
- Fewer than 30% of men with the most significant level of comorbidity received surgery, radiation therapy, or combinations of aggressive therapy as compared with almost 55% of men who had no comorbid ailments

J Clin Epidemiol 1996; 34:152-162.

Breast Cancer Example

- Greenfield et al conducted a retrospective review to examine degree of appropriateness of initial treatment for elderly patients with breast cancer
- Sample included women with breast carcinoma that received their primary cancer management at one of seven hospitals in southern California
- Appropriate treatment defined according to *criteria map* that incorporates widely accepted practice standards

Relationship of the Comorbidity Index (CI) to Physician Management of Breast Cancer

Number of Patients With Treatment			
CI Score	Inappropriate	Appropriate	Total
None, Mild	53 (19%)	231 (81%)	284
Severe	37 (41%)	53 (59%)	90
Total	90 (24%)	284 (76%)	374 (100%)

$P < 0.001$ $\chi^2 = 17.640$ Yates corrected

Advanced Stage Head and Neck Cancer Example

Severe Comorbidity	Initial Treatment Radiation Therapy Only	Odds Ratio (95% CI)
Absent	84/311 (27%)	1.0
Present	23/45 (51%)	2.82 (1.50-5.29)
Total	107/356 (30%)	

Poor Quality of Care?

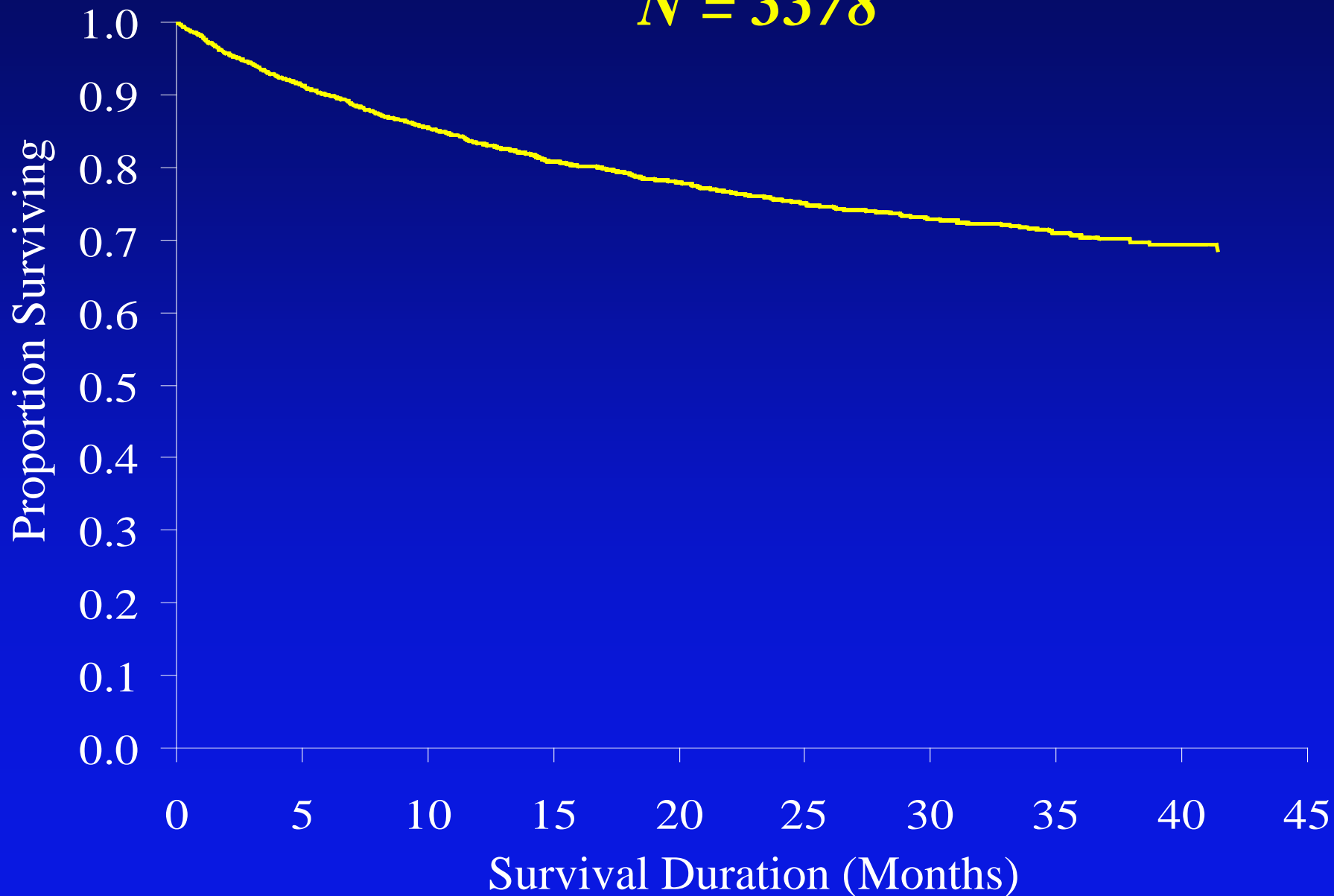
Sound Clinical Judgment?

Impact of Comorbidity on Prognosis

- In many cancers, comorbidity prognostically more important than tumor size or TNM stage
- Particularly important for slow growing cancers and cancers which affect older people
- Comorbidity can create significant prognostic differences in patients with the same morphologic and histologic manifestations of the index disease

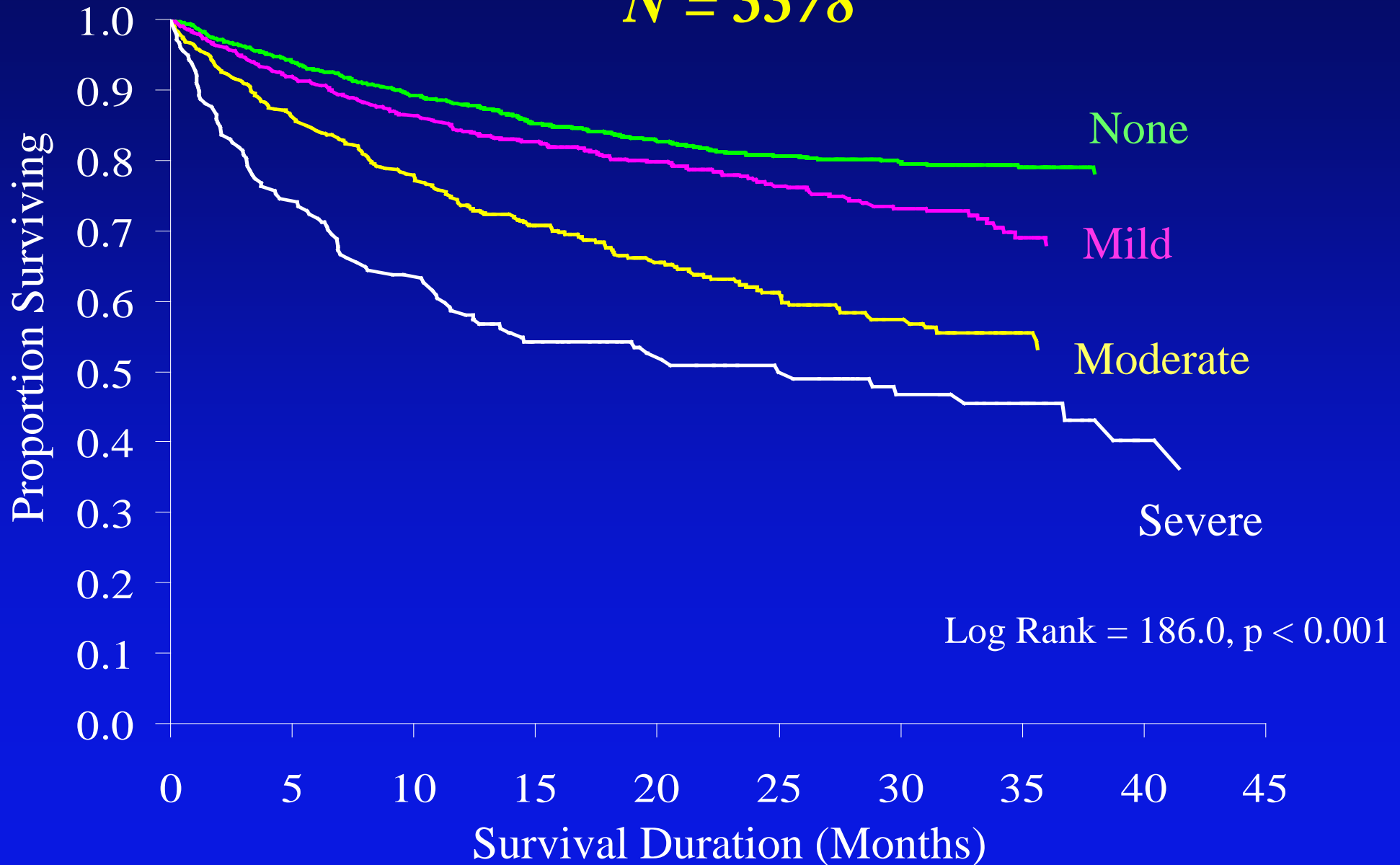
Overall Survival

N = 3378



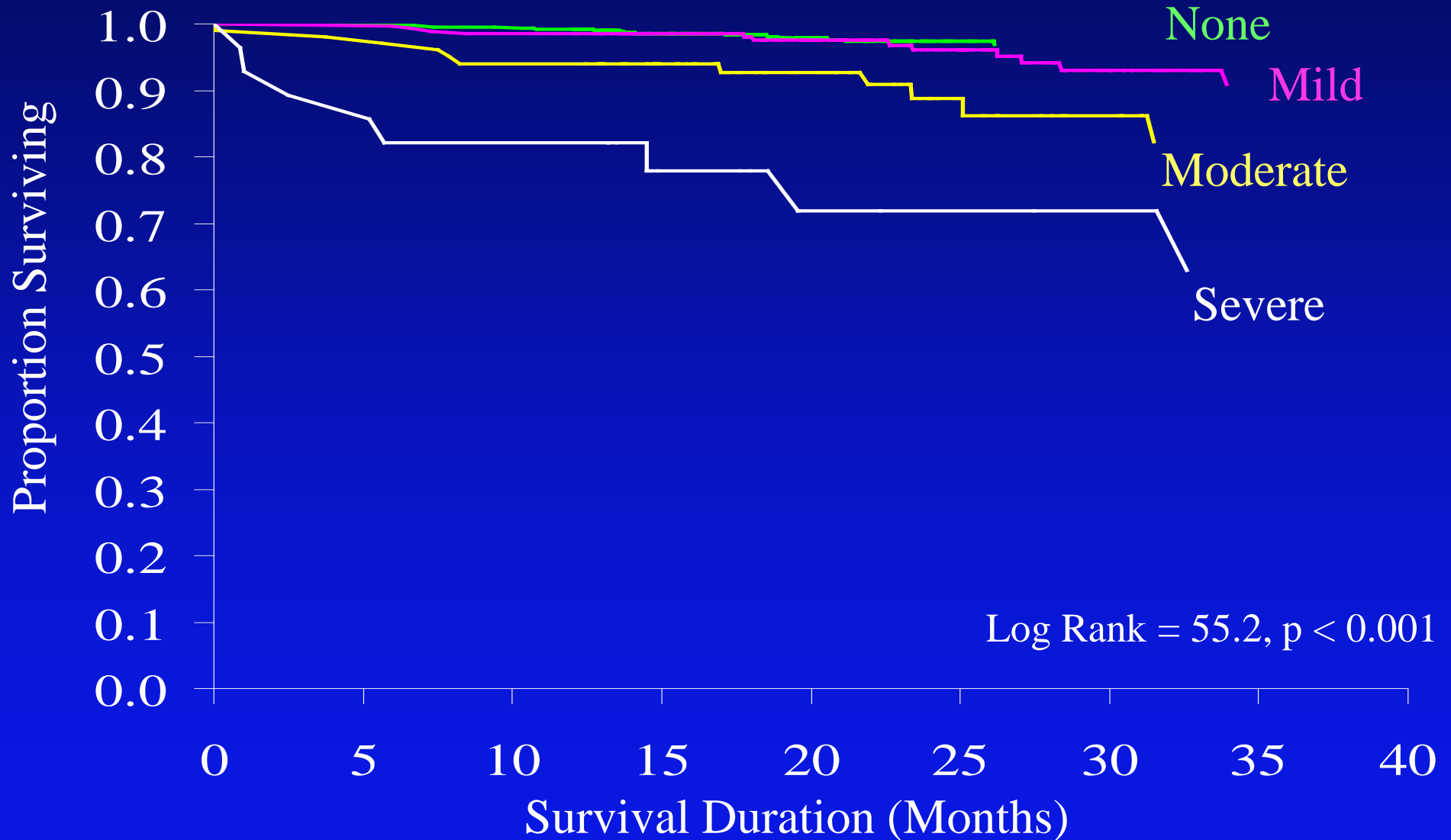
Impact of Comorbidity on Survival

N = 3378



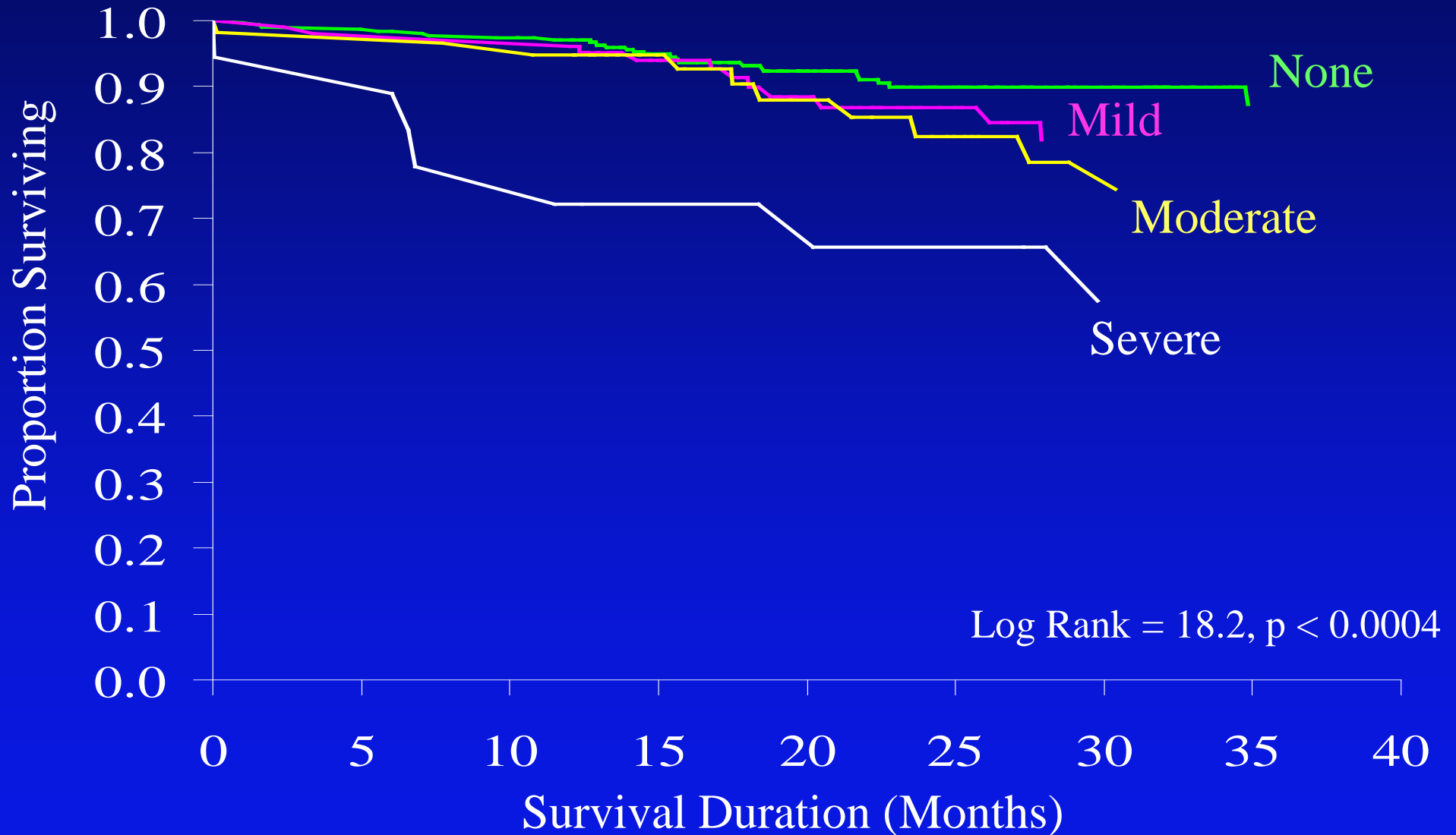
Prostate Cancer

$N = 1687$



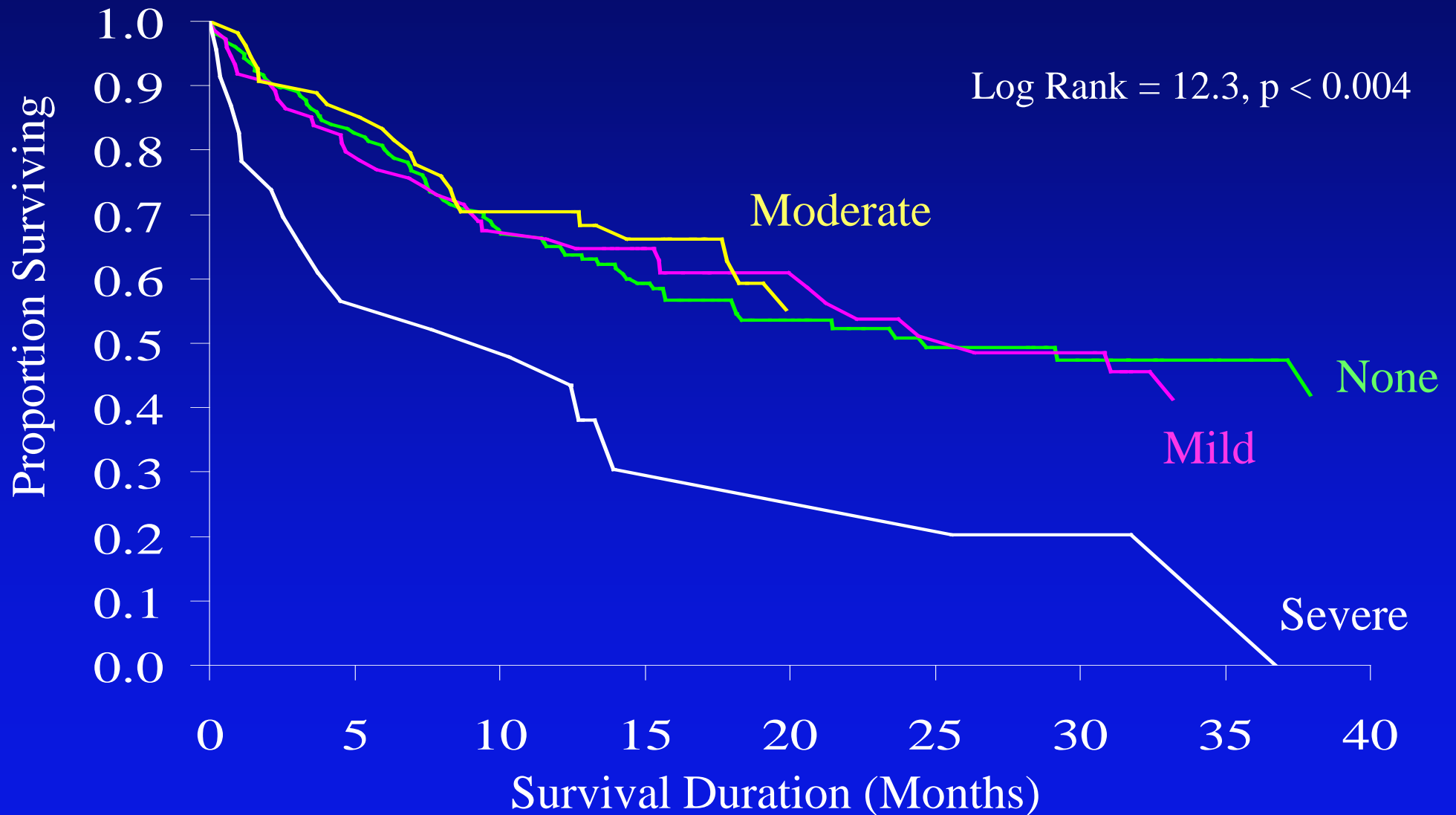
Breast Cancer

$N = 665$



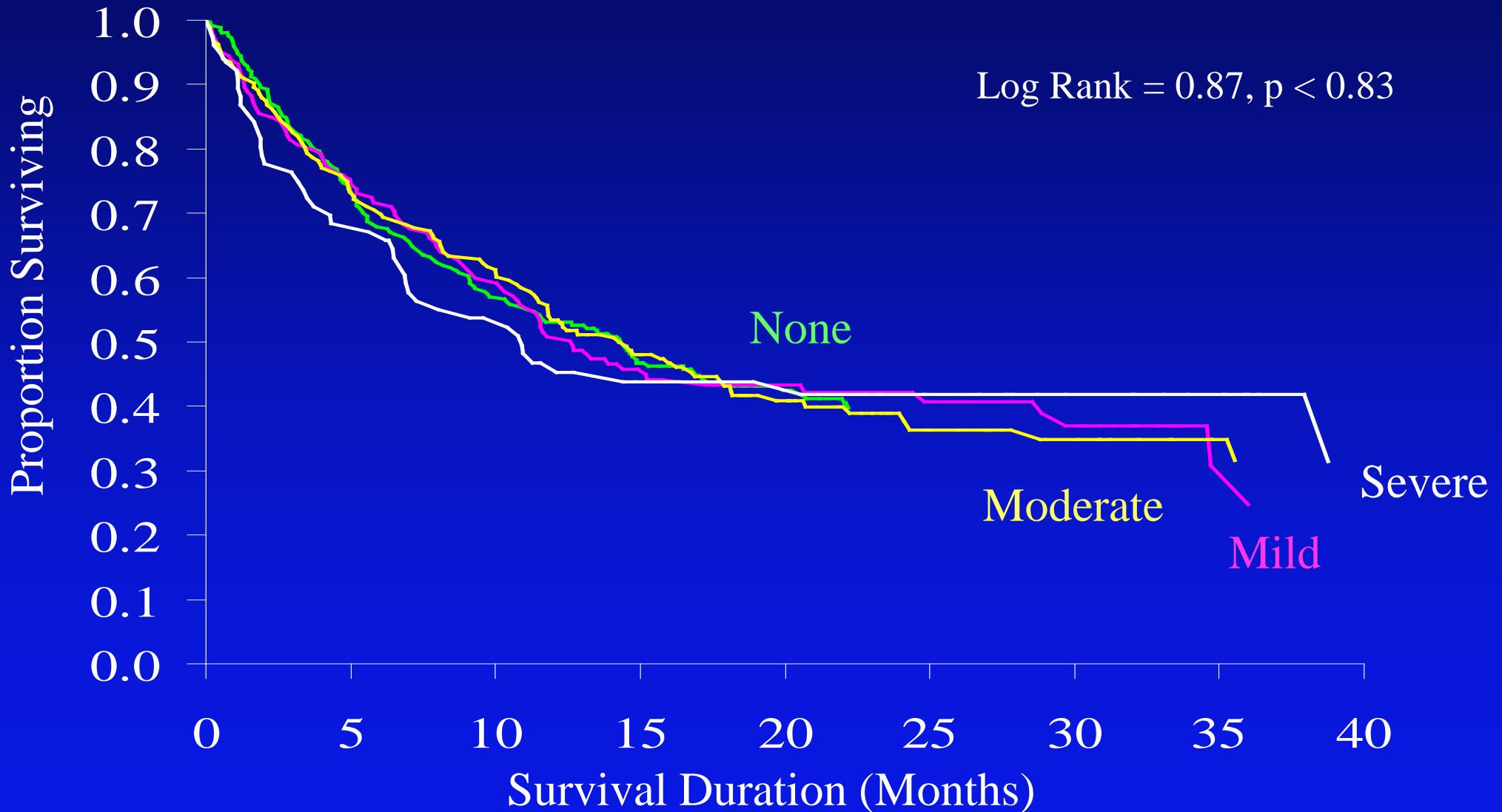
Colorectal Cancer

$N = 469$



Lung Cancer

$N = 984$



Results of Logistic Regression: Multivariable Analysis of Comorbidity

Category	Adjusted RR*	95% CI
None	Reference	
Mild	1.0	0.9 – 1.2
Moderate	1.6	1.3 – 1.9
Severe	1.6	1.3 – 2.0

* Adjusted for Age, Gender, Race, Site, and TNM Stage

Interaction Between Comorbidity, Treatment, and Survival

- Is the observed decrease in survival for patients with severe comorbidity actually due to less aggressive treatment?
- Cox Proportional Hazards analysis performed to examine independent impact of comorbidity on survival
- Null hypothesis: After controlling for tumor site, size, and initial treatment, comorbidity has no impact on survival for patients with H&N cancer

Cox Proportional Hazards Model

Variable	Category	Adjusted Risk Ratio*	95% CI	p Value
Site	Larynx	1	--	--
	Oral Cavity	1.230	1.022-1.479	0.0283
	Oropharynx	1.127	0.947-1.340	0.1776
TNM	Stage I	1	--	--
	Stage II	1.267	1.003-1.600	0.0472
	Stage III	1.787	1.421-2.248	0.0001
	Stage IV	2.758	2.177-3.492	0.0001
Prognostic Comorbidity	Absent	1	--	--
	Present	1.462	1.176-1.818	0.0006

* Adjusted for Initial Treatment

Quality of Care Example

- Greenfield et al studied differences in mortality rates for 969 patients with incident cases of breast, colorectal, and prostate cancers across seven hospitals in southern California
- Of the seven hospitals, the three with the highest mortality had been pinpointed by the *Los Angeles Times* as high mortality outliers

JAMA 1988; 260:2253-2255

- The percentage of patients with severe comorbidity scores ranged from 9% to 18% across the seven hospitals ($p < 0.01$)
- The rankings of hospitals varied depending on whether one adjusted for age, comorbidity level, or cancer stage

Clarify Impact of Other Variables

- Comorbidity assessment important even when it is not independently statistically significant
- Hillner found decrease likelihood of axillary node dissection with increasing comorbidity
- After adjusting for age and size of primary tumor, comorbidity no longer associated with node dissection
- Inclusion of comorbidity allowed for more robust conclusions about age

Comorbidity Education Program

To demonstrate that the teaching program developed at Barnes-Jewish Hospital has broad generalizability to cancer registrars at five different oncology data centers across the United States

Nationwide Comorbidity Network

Hospital Name	City, State	# of Registrars	Estimated cases/year	Commission on Cancer Program
Washington Hospital Center	Washington, D.C.	3	818	Teaching Hospital Cancer Program
North Kansas City Hospital	Kansas City, MO	1	583	Community Hospital Cancer Program
Queen of the Valley Hospital	Napa, CA	1	377	Community Hospital Cancer Program
Dakota Clinic	Fargo, ND	3	948	Community Hospital Cancer Program
Hannibal Regional Hospital	Hannibal, MO	1	216	Community Hospital Cancer Program

Results of Comorbidity Education Program

- Demonstrated almost perfect agreement in the coding of severity of comorbidity
- Coding comorbidity was easy to do
- Satisfaction with the education program was high
- Coding comorbidity required ~6% additional time

Conclusions

- Comorbidity is important in the selection of treatment, prognosis, and evaluation of quality of care
- The results of the cancer registrar education program demonstrate that comorbidity can be accurately and efficiently obtained from the medical records of patients with newly diagnosed cancers

Comorbidity should be added as a required data element to hospital-based and central cancer registries