DATA ELEMENTS NEEDED FOR QUALITY ASSESSMENT COPYRIGHT NOTICE

Data Elements Needed for Quality Assessment

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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
- Comorbidity has direct impact on the care of patients and the assessment of the quality of care

Comorbidity Impact on Therapy

- The use of preferred therapy might be contraindicated due to the presence of comorbid ailments
- There are two distinct ways that comorbid ailments might impact on type of therapy

- The comorbid ailment(s) may render an overall prognosis so poor for the patient that she may be denied an otherwise desirable treatment for the index cancer

- 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

Breast Cancer Example

- Greenfield et al conducted a retrospective review to examine whether physicians provide less vigorous 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

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

	Number (%) of Patients With Treatment		
CI Score	Inappropriate	Appropriate	Total
0-1	53 (19)	231 (81)	284
2	37 (41)	53 (59)	90
Total	90 (24)	284 (76)	374 (100)

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

Head and Neck Cancer Example

Prognostic 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%)	

Quality of Care Example

Greenfield et al studied whether differences in mortality rates for 969 patients with incident cases of breast, colorectal, and prostate cancers across seven hospitals in southern California could be accounted for, in part, by patient's differing levels of comorbidity on admission

- Of the seven hospitals, the three with the highest mortality had been pinpointed by the *Los Angeles Times* as high mortality outliers
- 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

Quality of Care Example

- Begg et al used the SEER-Medicare linked database to study the relationship between the volume of major cancer surgeries performed and the hospital operative mortality rate

- The investigators used the Medicare discharge summary from the index hospitalization to generate a comorbidity severity score

- Higher surgical volume was linked with lower mortality

- This volume -- mortality relationship persisted even after adjustment for age and comorbidity

- By having comorbidity information, the authors were able to rebut the complaint that high volume hospitals were, in some way, selecting less sick patients

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

Poor Quality of Care?

Sound Clinical Judgment?

Comorbidity Instruments

- Several instruments have been developed to classify different comorbid diseases and to quantify the severity of the overall comorbid condition
- None of the instruments were specifically designed to study comorbidity in cancer patients
- Nevertheless, these instruments have been used to classify comorbidity in several types of cancers and have performed well

- Instruments to measure the severity of comorbidity can be classified into four mutually exclusive groups depending on the

  - origin of the data
    (medical record review *vs.* claims-based)

  - applicability of the instrument
    (general *vs.* disease-specific)

Medical Record Review

- Kaplan-Feinstein Index
- Charlson Comorbidity Index
- The Index of Co-Existent Disease

Kaplan-Feinstein Index

- Developed from the study of comorbidity in patients with diabetes mellitus
- The KFI has been used to study the impact of comorbidity in several cancers
- Specific diseases and conditions are classified into four groups-- none, mild, moderate, or severe according to severity of organ decompensation and prognostic impact

Kaplan, Feinstein. *J Chron Dis.* 1974;27:387-404

Example

Peripheral Arterial Disease

- Mild – Untreated thoracic or abdominal aneurysm (< 6 cm)
- Moderate – Bypass or amputation for gangrene or arterial insufficiency > 6 months ago
- Severe – Untreated thoracic or abdominal aneurysm (> 6 cm)

Overall Comorbidity Score

- Highest ranked single ailment
- In cases where two or more Moderate ailments occur in different organ systems, the Overall Comorbidity Score should be designated as Severe

Example

CONDITION	DECOMPENSATION
Myocardial Infarct more than 6 months ago	Moderate
DBP 90-114 mm Hg	Mild
History of alcohol abuse, but not presently drinking	Mild
Overall Comorbidity Score	Moderate

Example

CONDITION	DECOMPENSATION
Chronic exertional angina	Moderate
Major depression controlled with medication	Mild
Diabetes requiring insulin	Moderate
Overall Comorbidity Score	Severe

Charlson Comorbidity Index (CCI)

- Developed from studies of one-year mortality for patients admitted to a medical unit of a teaching hospital
- Scores for comorbid diseases derived from a weighted index based on the adjusted relative risk of mortality associated with each disease
- Total score is sum of weighted scores

Charlson ME, *et al.* J Chron Dis 1987;40(5):373-383.

Index of Co-Existent Disease (ICED)

- Designed to predict LOS and resource utilization after hospitalization
- Instrument assesses patient status in two domains
  - Individual Disease Severity (IDS)
    - reflects severity of health categories (0-4)
  - Functional Severity
    - assesses physical impairment before treatment (0-2)
- Peak intensities for each domain are grouped to give ICED score (0-3)

Greenfield S, *et al.* Med Care 1993;31(2):141-154.

Inclusion of Comorbidity into Oncology Data Registries

- Educational program developed to train CTRs to code comorbidity from the medical record
- Program consisted of an introduction to the importance of comorbidity, the use of comorbidity instrument and documentation book, and many clinical examples
- The entire educational session lasted 10 hours
- CTRs demonstrated excellent performance

Claims-Based

- Modifications of Charlson
  - Dartmouth-Manitoba ICD-9 conversion algorithm
  - Deyo et al
  - Ghali et al
- Von Korff et al chronic disease score from automated pharmacy records

Charlson Comorbidity Index—Electronic Version

Assigned weights for diseases	Conditions	ICD-9-CM Codes
2	Hemiplegia	344.1, 342-342.9
	Moderate or sever renal disease	582-582.9, 583-583.7, 585, 586, 588-588.9
	Diabetes with end organ damage	250.4-250.6
	Any tumor	140-172.9, 174-195.8
	Leukemia	204-208.9
	Lymphoma	200-203.8
3	Moderate or severe liver disease	572.2-572.8, 456.0-456.21
6	Metastatic solid tumor	196-199.1
	AIDS	042-044.9

Impact of Methods of Assessment

- Concato et al studied the association of comorbidity, as assessed by medical record review, and operative mortality after transurethral resection of the prostate (TURP) and open prostectomy (OPEN) for patients with benign prostatic hypertrophy
- Previous research, using administrative databases, had shown the relative risk of 5-year mortality for TURP was elevated, relative to OPEN

- These findings were counter-intuitive since TURP is a less invasive procedure and would be expected to have lower mortality rates

- In addition, procedure-associated mortality would be expected to occur within 30 days of the procedure and would not be significant at five-year follow-up

- Concato performed detailed chart review to assign levels of comorbidity based on several different comorbidity indices to 250 men undergoing TURP or OPEN prostectomy between 1979 and 1981
- For the TURP group, the crude 5-year mortality rate was 17.5% (22 of 126 patients) and for the OPEN group 13.5% (17 of 126 patients)
- Patients who received TURP were older and had a higher level of comorbidity than patients undergoing OPEN

- As the detail and quality of the assessment of comorbidity increased, the adjusted risk of mortality after TURP decreased

- Concato concluded that comorbidity adjustment is complex and that inadequate or incomplete assessment of comorbidity may lead to false conclusions regarding relative treatment effectiveness

Medical Record Approach

- Comorbidity severity can be assigned to a majority of patients within tumor registry
- Very accurate assessment of comorbidity
- Comorbidity coding added approximately 3% additional work effort

Claims-Based Approach

- Available in many states for many people
- Attractive alternative to more expensive methods of ascertaining comorbidity
- Claims-based databases may not be available for all patients in a tumor registry
- Less accurate assessment

Conclusions

- Comorbidity impacts on screening, diagnosis, treatment, and prognosis
- Valid comorbidity instruments exist
- Comorbidity can be derived from medical records or claims-based
- Medical record approach more accurate and complete
- Claims-based approach less expensive

Recommendations

- Comorbidity should be required data element for all studies of the patterns and quality of cancer care
- Claims-based approach first step for inclusion of comorbidity
- Medical-records approach second step with cancer registry staff training and incorporation into hospital-based, state, and national cancer registries
- Special studies, such as SEER, NCDB, should employ medical record review whenever possible