Cumulative Illness Rating Scale (Hudon et al.)

A scoring guide for chronic diseases adapted for general practice

Tom Brett, Diane Arnold-Reed, Bob Moorhead, Geoff Bovell, Hilary Fine, Max Bulsara
What is multi-morbidity?

“The existence or occurrence of two or more chronic medical diseases within one person” (Feinstein, 1967)

“The presence of illness in two or more domains” (Britt et al, 2008)
Significance

• Multi-morbidity is associated with poor outcomes and an increased incidence of fragmented, ineffective and costly health care.

• Prevalence of multi-morbidity = 60/100 (age 55 to 74)*

  Prevalence individual chronic diseases: asthma = 7/100
  hypertension = 30/100
  diabetes = 9/100

1 published paper on multi-morbidity: 74 on asthma
                                            94 on hypertension
                                            38 on diabetes

So what?

388,000,000 people will die in the next 10 years of a chronic disease

1,000,000,000 people are overweight

60% of all deaths are due to chronic diseases

$558 billion

The estimated amount China will forego in national income over the next 10 years as a result of premature deaths caused by heart disease, stroke and diabetes

*WHO (World Heath Organization), Preventing Chronic Diseases a vital investment, 2005.
What is the problem?

- Limited data worldwide describing extent of multi-morbidity in primary care patients
- Need to estimate the prevalence among general practice patients
- Need to count the number of chronic medical conditions
- Need a measure that considers the severity of these conditions (CIRS)
Review of medical records

- Probably the best method of collecting information about medical diagnoses
- Many studies lack a clear definition that defines the clinical burden
- Is hypothyroidism and psoriasis the same burden of disease as diabetes and asthma?
- Simply counting the number of conditions is too restrictive
CIRS

- Cumulative Illness Rating Scale
- Validated, Easy to apply in primary care
- Doctors and nurses best

- Measures chronic medical illness burden while taking severity of the conditions into account
How useful?

• Increase our understanding of consequences of multi-morbidity

• Improve overall quality of care of these patients

• Reflects their common problems
Individual systems/domains

- CIRS first devised by Linn (1968)
- Later refined by Miller or use in elderly (1992)
- Rating scale ranges 0 - 4
- Final score is highest in each system/domain
- Can vary 0 - 56
General principles

• Each disease classified in its system
• If several, only most severe is rated
• With controlled angina (2) and severe heart failure (4), the higher score is rated
• Lung cancer with bone metastases involves two systems
• (Respiratory = 4 and Musculoskeletal = 2)
General rules for severity rating

0 - No problem affecting that system
1 – Current minor problem or past sig problem
2 - Mod disability or morbidity and/or requires first line therapy
3 – Severe problem and/or constant and sig disability and/or hard to control problems
4 – Extremely severe problem and/or immediate treatment reqd and/or organ failure and/or severe functional impairment
Rated 0

- No problem or healed minor injuries
- Past childhood illnesses - (chickenpox)
- Minor surgery (repair carpal tunnel, LSCS)
- Uncomplicated healed fractures
- Other past problems now healed - (pneumonia)
Rated 1

- Current medical problem, minor discomfort (controlled asthma, occ heartburn)

- Minor impact on morbidity

- Medical problems not currently active but sig in past (kidney stone, spontaneous pneumothorax)

- Major past surgery (hysterectomy, cholecystectomy)
Rated 2

- Medical conditions needing daily treatment (asthma controlled with inhaled steroids, GORD needing daily treatment)

- Moderate disability or morbidity

- Hypertension - two treatments
Rated 3

- Chronic conditions not controlled with first line therapy (asthma needing continuous oral steroids, symptomatic angina despite medical regimes)

- Constant significant disability

- Severe problem
Rated 4

- Extremely severe problem

- Organ failure (02 dependent COPD, CRF needing dialysis, terminal heart failure)

- Severe sensory impairment (almost complete blindness or deafness, wheelchair bound)

- Severely affected QOL, severe impairment of function
Cancer ratings

1. Cancer in remote past without recurrence or sequel in past 10 years

2. No evidence recurrence or sequel in 5 years

3. Required chemo, radiation or hormonal treatment in past 5 years

4. Recurrent malignancy or metastasis or palliative treatment
Medical problems by system

Cardiac

• Any cardiac problem? (Angina, AMI, CABG, arrhythmia, valve problems)

• If yes, any medications taken?

• Any heart surgery in the past?
Vascular

• Any circulatory problem (includes PVD, AAA), hypertension or raised cholesterol problem?

• If yes, any medications taken for these problems?

• Any vascular surgery in the past - (femoral artery graft, carotid endarterectomy)?
Respiratory

- Any respiratory problem? (asthma, COPD, PE, CF)
- If yes, any medications taken, aerosols?
- Any lung surgery?
- Cigarette smoking. Packs/day? For how long?
- Pack years = number packs/day x no. years smoked (1 pack/day x 20 years = 20 pack years)
- Smoker up to 20 pack years rated 1
- Smoker from 21-40 pack years rated 2
- Smoker over 40 pack years rated 3
Endocrine, metabolic, breast

- Any problem of thyroid gland, obesity, diabetes, or other hormonal problem?

- For obesity: $\text{BMI} > 30$ Rated 1
- $\text{BMI} > 30 + \text{meds or mod disability}$ Rated 2
- $\text{BMI} > 45$ Rated 3

- Menopause – without symptoms or HRT - Rated 0
  - with symptoms or HRT - Rated 1
14 system modified version of CIRS

- Systems
- Cardiac
- Vascular
- Haematological
- Respiratory
- Eyes and ENT
- Upper GIT
- Lower GIT
- Hepatic and pancreatic
- Renal
- Genitourinary
- Musculoskeletal and tegumental
- Neurological
- Endocrine, metabolic, breast
- Psychiatric

<table>
<thead>
<tr>
<th>Systems</th>
<th>Scores</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cardiac</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vascular</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Haematological</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Respiratory</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eyes and ENT</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Upper GIT</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lower GIT</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hepatic and pancreatic</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Renal</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Genitourinary</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Musculoskeletal and tegumental</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Neurological</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Endocrine, metabolic, breast</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Psychiatric</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total score</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## Estimating severity index

Patients presenting to WA GP clinic  
1 July and 31 December 2008

n=2,664  
Age range (4 months – 99 years)

Data extracted from patient records  
October 2009 - February 2010

### Cumulative Illness Rating Scale (CIRS)
0-4 to record the severity of conditions (morbidities) grouped into 15 domains (e.g. Cardiovascular, Respiratory)

### Ethical issues

Inter-rater reliability (n=30)  
ICC (total no. systems /15) = 0.927  
ICC (total CIRS score /60) = 0.93
Using the CIRS

Data extracted from patient records
Results: Severity burden of multi-morbidity

Severity distribution within age groups using patient total CIRS scores
Results

Prevalence of multi-morbidity by patient age group

Patient age (years)

Frequency of inadequacy (n=500)

- <20: 10.12%
- 20-44: 15.13%
- 45-64: 78.13%
- 65-74: 55.12%
- 75+: 87.4%
What's the importance of these findings?

- 54.8% of people attending the practice have multi-morbidity.
- Knowing about disease combinations needed for design of best practice guidelines.
- Doctors in the future will need to become more informed about multi-morbidity.
- Interventions for single conditions may differ from M-M
- RCTs often exclude such patients – weak evidence base
- Future guidelines, Training exposure…