

## MAIN DEFINITIONS

Version 2.0, March 20, 2014

### C.1 Charlson co-morbidity index

The Charlson co-morbidity index developed a weighted index measure of co-morbidities based on medical records review and identified a total of 19 conditions that influence mortality. Both the number and the seriousness of co-morbid conditions were taken into account. Each of the 19 conditions has a weight assigned from 1 to 6, which was derived from relative risk estimates of a proportional hazard regression model using clinical data. A patient's comorbidity index would be the sum of all weighted co-morbidities. A higher score on the Charlson index indicates a greater burden of co-morbid conditions.

Note, however, that co-morbidities are generally supposed to be unrelated to the condition of interest, thus only claims from date of diagnosis-12 months to date of diagnosis-1 month (that is the month of diagnosis) should be considered to calculate the Charlson index.

Condition	Score
Myocardial infarct	1
Congestive heart failure	1
Peripheral vascular disease	1
Cerebrovascular disease	1
Dementia	1
Chronic obstructive pulmonary disease	1
Connective tissue disease/ Rheumatologic disease	1
Peptic ulcer disease	1
Mild liver disease	1
Diabetes without end organ damage	1
Hemiplegia or Paraplegia	2
Moderate to severe renal disease	2
Diabetes with end organ damage	2
Any malignant solid tumour (additional to that in study) without metastasis	2
Lymphoma	2
Leukemia	2
Moderate or severe liver disease	3
Metastatic solid tumour	6
AIDS\HIV	6

#### References:

1. Charlson ME, Pompei P, Ales KL, et al. A new method of classifying prognostic comorbidity in longitudinal studies: development and validation. *J Chron Dis* 1987;40:373–383.
2. Deyo RA, Cherkin DC, Ciol MA. Adapting a clinical comorbidity index for use with ICD-9-CM administrative databases. *J Clin Epidemiol* 1992;45:613–619.
3. Romano P, Roos L, Jollis J. Adapting a clinical comorbidity index for use with ICD-9-CM administrative data: differing perspectives. *J Clin Epidemiol* 1993;46:1075–1079.
4. National Cancer Institute. Seer-Medicare linked database. <http://appliedresearch.cancer.gov/seermedicare/training2013/Segment%2012-Comorbidity%20and%20Risk-April%202013.pdf>

## C.2 Karnofsky performance status

The Karnofsky performance scale index allows patients to be classified as to their functional impairment. This can be used to compare effectiveness of different therapies and to assess the prognosis in individual patients. The lower the Karnofsky score, the worse the survival for most serious illnesses.

Explanation of activity		Score
Able to carry on normal activity and to work; no special care needed.	<b>Normal no complaints:</b> no evidence of disease.	100
	<b>Able to carry on normal activity:</b> minor signs or symptoms of disease.	90
	<b>Normal activity with effort:</b> some signs or symptoms of disease.	80
Unable to work; able to live at home and care for most personal needs; varying amount of assistance needed.	<b>Cares for self:</b> unable to carry on normal activity or to do active work.	70
	<b>Requires occasional assistance,</b> but is able to care for most of his personal needs.	60
	<b>Requires considerable assistance</b> and frequent medical care.	50
Unable to care for self; requires equivalent of institutional or hospital care; disease may be progressing rapidly.	<b>Disabled:</b> requires special care and assistance.	40
	<b>Severely disabled:</b> hospital admission is indicated although death not imminent.	30
	<b>Very sick, hospital admission necessary:</b> active supportive treatment necessary.	20
	<b>Moribund:</b> fatal processes progressing rapidly.	10
	<b>Dead</b>	0

### References:

1. Crooks V, Waller S, Smith T, et al. The use of the Karnofsky Performance Scale in determining outcomes and risk in geriatric outpatients. *J Gerontol* 1991; 46: M139-M144.
2. de Haan R, Aaronson N, Limburg M, et al. Measuring quality of life in stroke. *Stroke* 1993;24:320-327.
3. Hollen PJ, Gralla RJ, Kris MG, et al. Measurement of quality of life in patients with lung cancer in multicenter trials of new therapies. *Cancer*. 1994;73:2087-2098.
4. O'Toole DM, Golden AM. Evaluating cancer patients for rehabilitation potential. *West J Med*. 1991;155:384-387.
5. *Oxford Textbook of Palliative Medicine*, Oxford University Press. 1993;109.
6. Schag CC, Heinrich RL, Ganz PA. Karnofsky performance status revisited: Reliability, validity, and guidelines. *J Clin Oncology*. 1984;2:187-193.

### C.3 WHO/ECOG performance status

<b>Explanation of activity</b>	<b>Score</b>
<b>Asymptomatic:</b> fully active, able to carry on all pre-disease performance without restriction	0
<b>Symptomatic but completely ambulatory:</b> Restricted in physically strenuous activity but ambulatory and able to carry out work of a light or sedentary nature, e.g., light house work, office work	1
<b>Symptomatic, &lt; 50% in bed during the day:</b> Ambulatory and capable of all selfcare but unable to carry out any work activities. Up and about more than 50% of waking hours	2
<b>Symptomatic, &gt; 50% in bed, but not bedbound:</b> Capable of only limited selfcare, confined to bed or chair more than 50% of waking hours	3
<b>Bedbound:</b> Completely disabled. Cannot carry on any selfcare. Totally confined to bed or chair	4
<b>Dead</b>	5

#### References:

1. Oken MM, Creech RH, Tormey DC, et al. Toxicity and response criteria of the eastern Cooperative Oncology Group. Am J Clin Oncol 1982;5:649-655.

#### **C.4 The International Prognostic Index (IPI)**

One point is assigned for each of the following risk factors:

- Age greater than 60 years ( >60 years old )
  - Stage III or IV disease
  - Elevated serum LDH (e.g. higher than upper normal limit)
  - WHO/ECOG performance status of 2 or 3 or 4
- Or
- Karnofsky performance status in the range 20% -50%
  - More than 1 extranodal site (  $\geq 2$  )

The sum of the points correlates with the following risk groups:

- Low risk (0-1 points)
- Low-intermediate risk (2 points)
- High-intermediate risk (3 points)
- High risk (4-5 points)

#### **References:**

1. A predictive model for aggressive non-Hodgkin's lymphoma. The International Non-Hodgkin's Lymphoma Prognostic Factors Project. N Engl J Med 1993;329:987-989.

#### **C.5 The Follicular Lymphoma International Prognostic Index (FLIPI)**

One point is assigned for each of the following adverse prognostic factors:

- Age greater than 60 years ( e.g. >60 years old )
- Stage III or IV disease
- Greater than 4 lymph node groups involved
- Serum hemoglobin less than 12 g/dL (e.g. < 12 g/dL)
- Elevated serum LDH (e.g. higher than upper normal limit)

The sum of the points allotted correlates with the following risk groups:

- Low risk (0-1 points)
- Intermediate risk (2 points)
- High risk (3-5 points)

#### **References:**

1. Solal-Céligny P, Roy P, Colombat P, et al. Follicular lymphoma international prognostic index. Blood 2004;104:1258-1265.