

# Prognostication

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Predicting life expectancy is not easy and it is as much an art as a science. Being able to make a reasonable, educated guess about a patient's illness trajectory and the likely prognosis is important because:

- Some patients (and their relatives) want to know prognosis
- Knowing the prognosis helps inform decisions regarding how aggressively to treat complications as they arise

A key element to determining prognosis is to understand the natural history of the particular disease that the patient suffers from. The course and natural history of end-stage organ failure (e.g. liver failure due to cirrhosis) is very variable and is often quite different from that of advancing cancer. Similarly, dementia and degenerative neurological conditions typically have a different course towards the end of life than advancing cancer.

## Objective Measures to Help with Prognosis

Numerous studies have confirmed that, in most circumstances, doctors tend to over-estimate life-expectancy and prognosis in patients with palliative illnesses. A number of clinicians have attempted to develop tools such as the Palliative Prognostic Index to help increase the accuracy of prognostication.

## Performance State in an Advancing Terminal Illness

For patient's who are gradually declining, their performance score or functional status is often very helpful in helping inform assessments about prognosis. As a rule of thumb, patients who are declining quickly, tend to keep declining quickly, and those who are declining slowly tend to continue to decline slowly.

## ECOG Performance Score

Probably the most widely used performance scale in oncology is the Eastern Co-operative Oncology Group (ECOG) scoring. This scoring system is often used in determining a patient's fitness for chemotherapy. When the ECOG score is 0 or 1 a patient would typically be considered fit for chemotherapy, where if the score is 2, 3 or 4 the patient may not be considered fit for chemotherapy.

ECOG Score	Features
0	Fully active with no performance restrictions
1	Strenuous physical activity is restricted but fully ambulatory and able to carry out light work
2	Capable of all self-care but unable to carry out any work activities; up and about > 50% of waking hours

3	Capable of only limited self-care; confined to bed or chair > 50% of waking hours
4	Completely disabled and totally confined to bed or chair

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### Karnofsky Performance Score

The Karnofsky Score is similar to the ECOG scoring system but is more detailed and more palliative care focussed. The Australian-modified version of it is widely used as it specifically designed for use in both a community and inpatient setting.

AKPS	Features
100	Normal with no evidence of disease
90	Able to carry out normal activity with only minor symptoms of disease
80	With some effort able to carry out normal activity with some symptoms of disease
70	Cares for self but unable to carry on normal activity or to do active work
60	Mostly able to care for mostly but requires occasional assistance
50	Considerable assistance and frequent medical care required
40	In bed more than 50% of the time
30	Almost completely bedbound
20	Totally bedbound and requiring extensive nursing care by professionals or family
10	Comatose or barely rousable
0	Dead

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### Specific Prognosis Scoring Tools

There are a number of prognostic scoring tools that are relatively well known in the palliative care world, including:

- Palliative Prognostic Index (PPI)
- Palliative Prognostic Score (PaP score)

### Palliative Prognostic Index

The Palliative Prognostic Index (PPI) is a tool that helps predict short-term survival in palliative care patients looking at performance score, oral intake, peripheral oedema, shortness of breath at rest and delirium. In a study in the late 1990s, a PPI > 6 was associated with a survival time of 3 weeks or less (with a sensitivity of 80% and a specificity of 85%).<sup>1)</sup>

Palliative Performance Score	If 10-20 - score 4
	If 30-50 - score 2.5
	If > 50 - score 0
Oral intake	If severely down - score 2.5
	If moderately down - score 1
	If normal - score 0

Oedema	If present - score 1
	If absent - score 0
Dyspnoea at rest	If present - score 3.5
	If absent - score 0
Delirium	If present - score 4
	If absent - score 0
Add the scores together to determine the total	

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## Palliative Prognostic Score

The PaP score has also been shown to be relatively accurate in predicting the short-term prognosis in both the palliative care and oncology inpatient settings. Patients are categorized into one of three groups based on dyspnoea, anorexia, the Karnofsky Performance Score, the doctor's prediction of survival and the total white cell and lymphocyte count. Patients who fit into group C have a median survival of 13 days, which compares to a median survival of 31 days for group B patients and 79 days for group C patients.<sup>2)</sup>

Dyspnoea	No - score 0
	Yes - score 1
Anorexia	No - score 0
	Yes - score 1
Karnofsky performance status	>=50 - score 0
	3-40 - score 0
	10-20 - score 2.5
Clinical prediction of survival in weeks	>12 - score 0
	11-12 - score 2
	9-10 - score 2.5
	7-8 - score 2.5
	5-6 - score 4.5
	3-4 - score 6
	1-2 - score 8.5
Total white cell count	4.8-8.5 - score 0
	8.5-11 - score 0.5
	>11 - score 1.5
Lymphocyte percentage	20-40% - score 0
	Low (12-20%) - score 1
	Very low (<12) - score 2.5
Risk group	
A = a score of between 0 and 5.5 - median survival 79 days	
B = a score of between 5.6 and 11 - median survival 31 days	
C = a score of between 11.1 and 17.5 - median survival 13 days	

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<sup>1)</sup> Morita T1, Tsunoda J, Inoue S, Chihara S. The Palliative Prognostic Index: a scoring system for

survival prediction of terminally ill cancer patients. Support Care Cancer. 1999 May;7(3):128-33.

<sup>2)</sup> Maltoni M, Nanni O, Pirovano M, Scarpi E, Indelli M, Martini C, Monti M, Arnoldi E, Piva L, Ravaioli A, Cruciani G, Labianca R, Amadori D. Successful validation of the palliative prognostic score in terminally ill cancer patients. Italian Multicenter Study Group on Palliative Care. J Pain Symptom Manage. 1999 Apr;17(4):240-7.

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