

Are we better a decade later in the accuracy of survival prediction by palliative radiation oncologists?

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Introduction

- ❖ Clinician-predicted survival (CPS) is a vital aspect of palliative care, allowing for determination of treatment intent and setting best suited to the patient.
- ❖ The primary objective was to assess CPS accuracy in cancer patients referred to the Rapid Response Radiotherapy Program (RRRP) for palliative radiotherapy.

Materials and Methods

- ❖ From August 2014-March 2017, CPS was provided by one of four radiation oncologists.
- ❖ Karnofsky Performance Status (KPS), primary cancer, site of metastases, and date of death was obtained.
- ❖ Mean difference between actual survival (AS) and CPS was used to determine the accuracy of predictions.

Table 1: Actual Survival (AS), Clinician predicted survival (CPS), and Accuracy of CPS

Survival Predictions and Accuracy	N = 172
AS (weeks)	
Mean ± SD	26.76 ± 30.49
(95% CI)	(22.17, 31.34)
Median (Inter-quartiles)	12.9 (5.9, 35.5)
Range	0.1, 152.4
AS categories	
≤12 weeks	82
13-26 weeks	31
27-52 weeks	28
>52 weeks	31
CPS (weeks)	
Mean ± SD	45.71 ± 38.77
(95% CI)	(39.87, 51.54)
Median (Inter-quartiles)	28.5 (13.0, 52.0)
Range	4.0, 208.0
CPS categories	
≤12 weeks	24
13-26 weeks	62
27-52 weeks	48
>52 weeks	38
Difference in AS – CPS (weeks)	
Mean ± SD	-18.95 ± 36.14
(95% CI)	(-24.39, -13.51)
Median (Inter-quartiles)	-14.0 (-36.4, -1.3)
Range	-150.4, 98.4
Survival estimation	
Overestimation	135 (78.49%)
Same estimation	1 (0.58%)
Underestimation	36 (20.93%)

Conclusions

- ❖ The survival estimates provided by radiation oncologists are inaccurate and overestimated.
- ❖ Further research should aim to validate prognostic models to improve accuracy.

Results

- ❖ 172 patients were included for analysis. Survival was overestimated in most patients (n=135, 78.5%) by 19.0 weeks on average (Table 1).
- ❖ KPS (p=0.2), primary cancer site (p=0.08), and site of metastases were not significantly related to CPS accuracy (Table 2).
- ❖ Gender was significantly related to CPS accuracy upon multivariable analysis (p=0.04), but not after excluding prostate and breast cancer patients (p=0.2).
- ❖ The mean difference between AS and CPS did not significantly change over subsequent visits (p=0.5) (Table 3).
- ❖ CPS accuracy was significantly lower compared to the previous RRRP study (p=0.04)

Table 2: Univariate analysis of predictive factors

Predictive factor	Coefficient (SE)	p-value	AIC
Gender (F vs. M)	11.768 (5.612)	0.0375	1711.7
Bone Metastasis (Y vs. N)	2.315 (8.119)	0.7758	1715.2
Lymph Metastasis	-5.015 (6.783)	0.4607	1715.1
Liver Metastasis	8.001 (6.353)	0.2096	1714.2
Lung Metastasis	9.721 (6.500)	0.1366	1713.5
Brain Metastasis	8.832 (9.004)	0.3280	1714.1
Other Sites of Metastasis	6.187 (6.778)	0.3626	1714.8
KPS >40	-12.11 (6.432)	0.0615	1684.7
KPS >70	-1.020 (6.401)	0.8736	1688.2
KPS categories (Overall)		0.1536	1678.8
50-70 vs. 0-40	-13.304 (6.858)	0.0541	
80-100 vs. 0-40	-9.854 (7.813)	0.2090	
80-100 vs. 50-70	-	0.6101	
Primary cancer site (Overall)		0.0835	1644.0
Breast vs. Prostate	23.050 (9.249)	0.0137	
GI vs. Prostate	23.331 (8.646)	0.0077	
Lung vs. Prostate	16.100 (7.729)	0.0388	
Other vs. Prostate	15.848 (11.811)	0.1816	
Urinary vs. Prostate	14.983 (10.859)	0.1696	
Breast vs. GI	-	0.9773	
Breast vs. Lung	-	0.4442	
Breast vs. Other	-	0.5721	
Breast vs. Urinary	-	0.4968	
GI vs. Lung	-	0.3932	
GI vs. Other	-	0.5435	
GI vs. Urinary	-	0.4643	
Lung vs. Other	-	0.9827	
Lung vs. Urinary	-	0.9170	
Other vs. Urinary	-	0.9506	

CI=Confidence Interval

SD=Standard Deviation

Table 3: General linear mixed model comparison of mean AS-CPS between visits

Comparison of Mean AS-CPS	p-value
Overall visits	0.5387
Visit 2 vs. 1	0.6638
Visit 3 vs. 2	0.1074
Visit 4 vs. 3	0.2137
Visit 5 vs. 4	0.5469
Visit 6 vs. 5	0.7787
Visit 2 vs. 1	0.6638
Visit 3 vs. 1	0.1797
Visit 4 vs. 1	0.7811
Visit 5 vs. 1	0.3807
Visit 6 vs. 1	0.6745