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# A Validation of the Oswestry Spinal Risk Index

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# Background

- ◆ Oswestry Spinal Risk Index (OSRI) published in 2013 (Balain et al) aims to predict survival in patients with spinal metastases
- ◆ Cohort of 199 patients with spinal metastases
- ◆ Primary tumour pathology and general condition most important factors in predicting survival:  $OSRI = PTP + 1 - GC$
- ◆ Predicted survival important factor when planning treatment
- ◆ Less need for lengthy investigations when time is of the essence

# Methods

- ◆ Salford Royal Foundation Trust neurosurgical database
- ◆ Prospectively recorded acute referrals to on call spinal surgery and neurosurgery
- ◆ Notes reviewed to identify patients undergoing surgery for spinal metastases between January 2009 & November 2011
- ◆ Primary tumours of the spine or intradural tumours excluded

# Methods

- ◆ 100 patients identified
- ◆ Primary Tumour Pathology (PTP) score allocated based on system used by Tomita et al: based on speed of growth of primary tumour
- ◆ General condition score allocated with the categories used by Balain et al, based on the Karnofsky Performance Status
- ◆ Kaplan-Meier survival analysis conducted to compare survival between patients with varying OSRI scores

# Methods

- ◆ Median survival times with 95% confidence intervals determined for each OSRI score
- ◆ Pairwise comparison of survival between groups assessed using Mantel-Cox log rank statistic
- ◆ Nagelkerke's pseudo- $R^2$  statistic evaluated for a logistic regression analysis of patient survival using the OSRI score as a predictor

# Results

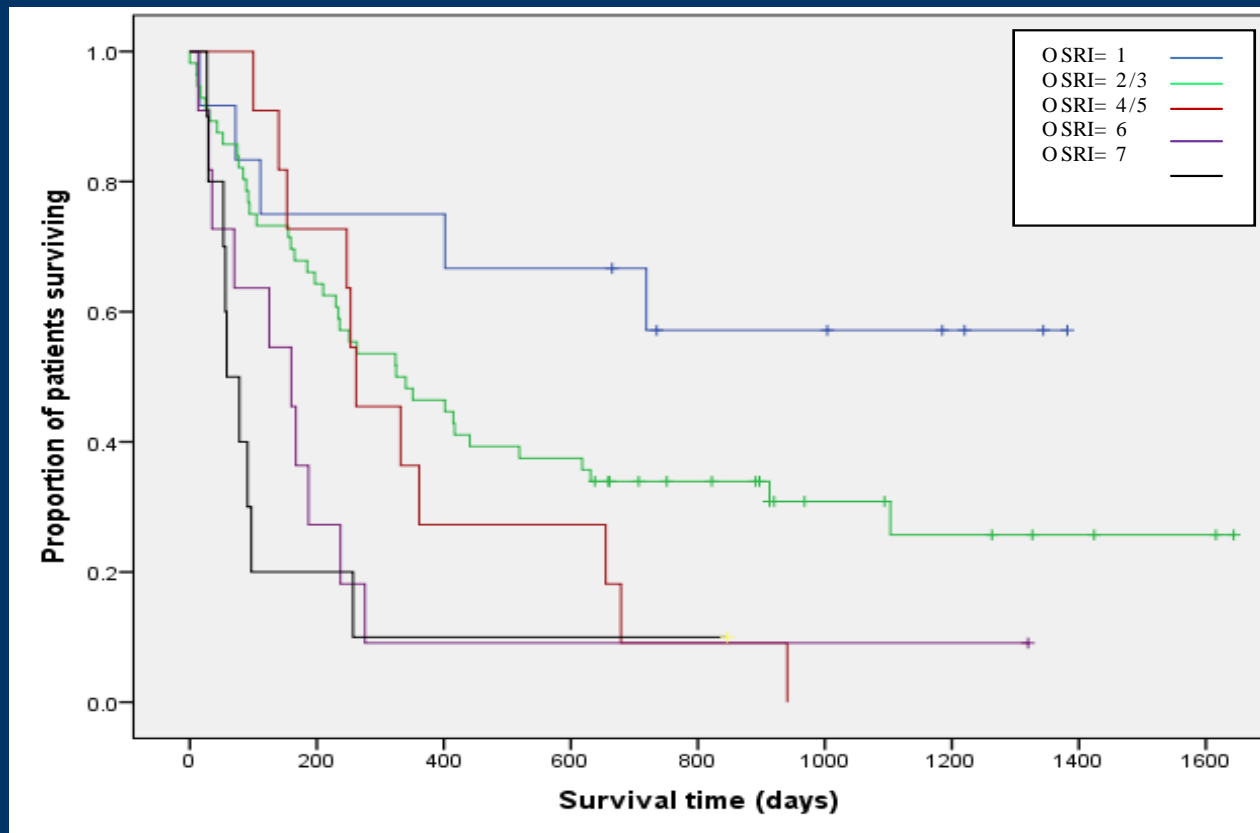
- ◆ Mean age 60.3 years (19-88)
- ◆ Most common tumour type: breast (n=24) followed by lung (n=20)
- ◆ 74 patients died during analysis period
- ◆ Analysis undertaken July 2013

## Median survival times and confidence intervals for patients with differing OSRI scores

<i>OSRI score</i>	<i>Median survival time (days)</i>	<i>95% CI for survival time (days)</i>
1 (n=12)	>50% survived until end of analysis	>50% survived until end of analysis
2/3 (n=56)	325	140-510
4/5 (n=11)	262	170-354
6 (n=11)	160	55-265
7 (n=10)	58	24-92
All (n=100)	253	165-341



# Survival curves for patients with varying OSRI scores



# Results

- ◆ Nagelkerke's pseudo- $R^2$  statistic of 0.145 obtained for logistic regression analysis of patient survival (OSRI score single predictor)
- ◆ 0.167 when patient ages were included as a controlling variable
- ◆ Balain et al, proposing the OSRI found this score to have a Nagelkerke's  $R^2$  of 0.28.

# Results

- ◆ The hazard ratio of 1.75 obtained for the OSRI score indicates that the hazard of death is raised by 75% for each advance in the OSRI classification.
- ◆ Using logistic regression (controlled for age model) 76% of patients were correctly classified.

# Discussion

- ◆ The OSRI is a significant predictor of survival in our patient population
- ◆ It is a useful tool when considering surgical treatment for patients with spinal metastases.
- ◆ The index has demonstrated good transferability across data sets, self-consistency and predictive capability in a validated study.
- ◆ We recommend its use.