






A web-based clinical prediction tool predicted 10 year survival in breast cancer

Olivotto IA, Bajdik CD, Ravdin PM, *et al.* Population-based validation of the prognostic model ADJUVANT! for early breast cancer. *J Clin Oncol* 2005;**23**:2716–25.

Clinical impact ratings Oncology ★★★★★☆

Q In women with stage I or II breast cancer, does the Adjuvant! web-based clinical prediction tool predict prognosis with and without adjuvant systemic therapy in terms of overall survival (OS), breast cancer specific survival (BCSS), and event free survival (EFS)?

METHODS

-  **Design:** validation of a previously developed clinical prediction guide.
-  **Setting:** British Columbia, Canada.
-  **Patients:** 4083 women with non-metastatic, stage I–II breast cancer diagnosed between 1989 and 1993. Exclusion criteria were male sex, age <20 or >85 years, incomplete local therapy, unknown tumour or nodal status, previous or synchronous contralateral breast cancer, or referral at relapse or <10 years of follow up.
-  **Description of prediction guide:** Adjuvant! (www.adjuvantonline.com) contains 10 year observed OS for women 36–69 years of age diagnosed with breast cancer between 1988 and 1992 in the US and entered in the Surveillance, Epidemiology and End Results (SEER) registry. BCSS and EFS were derived from the SEER registry. Estimates of treatment efficacy were derived from the 1998 Early Breast Cancer Trialists’ Collaborative Group meta-analysis data. For the validation, patient age, tumour size, number of positive nodes, grade, oestrogen receptor status, and adjuvant systemic therapy used were entered into the model for each patient and 10 year OS, BCSS, and EFS were calculated.
-  **Outcomes:** 10 year OS, BCSS, and EFS. The observed percentages for each outcome were calculated for the 4083 patients and compared with the Adjuvant! predicted values.

MAIN RESULTS

The Adjuvant! predicted rates and observed rates for OS, BCSS, and EFS were within 1% for the entire cohort of women (table). Differences between Adjuvant! and observed rates for most subgroups were within 2% or not statistically significant if >2% (p>0.05). Exceptions were more optimistic predictions by Adjuvant! in women 20–35 years of age with differences of 8.6%, 9.6%, and 13.6% for OS, BCSS, and EFS, respectively, and in women with lymphatic vascular invasion with differences of 3.6%, 3.8%, and 4.2%.

For correspondence: Dr I A Olivotto, BC Cancer Agency, Victoria, British Columbia, Canada. iolivott@bccancer.bc.ca

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CONCLUSION

In women with stage I or II breast cancer, the Adjuvant! clinical prediction tool predicted 10 year overall survival, breast cancer specific survival, and event free survival within 1% of observed survival.

Commentary

Understanding in the past 30 years of the potential for occult distant metastases in early stage breast cancer led to the development of adjuvant systemic therapies. These have had a major effect in improving long term survival in breast cancer. However, only a minority of patients benefit—some are destined never to relapse, and others relapse despite therapy. Thus, much energy has been exerted in developing prognostic factors and models and, more recently, predictive factors.

Adjuvant! is one such model, and Olivotto *et al* report a validation study. While it is excellent to see validation being done (few models or factors in the literature have been properly validated), it is surprising that this was not done before the model became available online for general use.¹ The main rationale for this model is to ascertain a reliable prognosis and to use this in deciding which adjuvant therapy is justified. This requires reliable data on the reduction in risk conferred by the therapy and its toxicity. This information has been imputed from the EBCTCG meta-analysis.^{2,3} Although it seems impressive that for all patients the predicted and observed outcomes for overall survival were within 1%, this does not mean that the model can predict prognosis and benefit for an individual patient. The model seemed less accurate for 2 subgroups (age <35 y and positive lymphatic or vascular invasion), and should be used with caution. Pragmatically, the model needs to identify those with an excellent prognosis who will probably not benefit from adjuvant therapy and those whose outlook is very poor and in whom current adjuvant therapies are largely ineffective. Patients with a moderate risk may well benefit from therapy. An extra dimension is added by predictive data (hormone receptors); this will be increasingly important as drugs such as trastuzumab are used.

Overall, Adjuvant! is a useful tool that has now been validated. However, the website is already looking at models in scenarios without validation, and, as with all models, it should be used with an understanding of its limitations.

Chris Williams, MD
Bristol Haematology and Oncology Centre
Bristol, UK

- 1 Altman DG, Royston P. *Stat Med* 2000;**19**:453–73.
- 2 Early Breast Cancer Trialists’ Collaborative Group. *Lancet* 1998;**351**:1451–67.
- 3 Early Breast Cancer Trialists’ Collaborative Group. *Lancet* 1998;**352**:930–42.

Survival predicted by Adjuvant! v observed survival in 4083 women with stage I or II breast cancer*

| Outcomes at 10 years | Adjuvant! predicted survival | Observed survival | Predicted minus observed |
|---------------------------------|------------------------------|-------------------|--------------------------|
| Overall survival | 71.7% | 72.0% | –0.3% |
| Breast cancer specific survival | 83.2% | 82.5% | 0.7% |
| Event free survival | 71.0% | 70.1% | 0.9% |