Cancer treatment accounts for a large proportion of healthcare costs. Often, new treatment modalities provide benefits, but at high costs. The impression that cancer treatment is expensive is enhanced by publicity surrounding treatments like bone marrow transplantation. There is a need to evaluate costs of different treatment approaches and to address the cost utility of cancer treatment in general compared with therapies for other conditions.

Breast cancer can serve as a good model for economic evaluation of cancer treatment because of the broad range of treatment options and objectives it encompasses, and also because well defined benefits can be achieved. The cost utility of contemporary adjuvant therapy strategies, specifically chemotherapy in premenopausal women and hormonal treatment in estrogen–receptor (ER) positive pre- as well as postmenopausal women, seems favourable. Cost-utility ratios [cost per quality-adjusted life-year (QALY) gained] range from $US4000 to $US10 000. However, hormonal treatment in ER-negative women may be associated with cost-per-QALY ratios of $US50 000 to $US200 000.

So far there are no published cost-utility analyses of neo-adjuvant therapy or adjuvant bone marrow transplantation as the long term effects of these treatment options are undefined. Few data exist on cost utilities of systemic drug treatment in advanced breast cancer, although drugs may account for only a moderate part of the total treatment and caring costs. Bone marrow transplantation in patients with metastatic breast cancer costs about $US100 000 per QALY, which is expensive.
Breast cancer is the commonest cancer in women, estimated to affect 5 million women worldwide in the next decade. The incidence of breast cancer has been steadily rising over the past few decades, and breast cancer is the most common cause of cancer death among women in most Western countries today (Muir et al. 1987). While about 90% of these women will present with disease clinically limited to the breast and axillary lymph nodes, nearly 50% of these women with early (operable) disease will later develop metastases (Harris et al. 1993). Although metastatic breast cancer is an incurable disease, many treatment options for palliation are available, and patients with advanced disease may live for years (Fey et al. 1981).

There are several reasons to focus on the cost utility of breast cancer treatment. First, the high incidence of the disease suggests that a significant amount of healthcare resources in a general as well as a surgical oncology unit needs to be allocated to the treatment of these patients. Secondly, treatment of breast cancer entails several treatment options apart from surgery. Radiotherapy as well as systemic treatment with endocrine and cytotoxic drugs over long time periods are warranted in many patients. Thirdly, breast cancer in many ways may be a good model for cost-utility analyses of drug therapy for solid tumours. In few other malignancies are the actual benefits from treatment, such as the objective response rate, times to progression of disease or survival benefits so well characterised.

This article focuses on the pharmacoeconomics of systemic drug therapy in breast cancer. While thousands of articles have been published over the last few decades addressing objective response rates and survival in women with breast cancer treated with different treatment modalities, so far the number of publications evaluating cost utility in breast cancer treatment is small. This article reviews and discusses the data published so far on the cost utility of drug treatment in breast cancer and also suggests areas for further research into this field.

1. Systemic Treatment of Breast Cancer

Systemic treatment of breast cancer is used in 3 different settings: (a) as treatment of metastatic disease; (b) as adjuvant therapy after primary surgery; and (c) as primary systemic treatment of locally advanced disease prior to surgery (neo-adjuvant therapy). The treatment options available are different forms of endocrine therapy and chemotherapy.

Endocrine therapy, and later chemotherapy, were first introduced for treatment of advanced disease. With encouraging results observed there, treatment options were extended into the adjuvant setting.

1.1 Systemic Treatment of Advanced Breast Cancer

The prognosis for breast cancer patients with metastatic disease is poor. Nearly all studies have reported the median survival from time of distant metastasis diagnosis to be less than 2 years (Rutqvist 1984).

A major problem in the treatment of advanced breast cancer is in addressing the impact of any therapeutic intervention on survival time. Clearly, so long as any treatment option (hormonal therapy, chemotherapy and local treatment) may palliate disease-related symptoms, to address the effects of a treatment option in a randomised trial with a non-treatment arm would be unethical.

An indirect comparison may be made by comparing survival in patient groups treated in randomised trials comparing different drug regimens in which a difference in response rate between the treatment arms was found. This has been done for chemotherapy. An overview analysis suggested that the more effective chemotherapy regimens might extend median survival by a few months when comparing with the less effective ones (A’Hern et al. 1988). A similar overview has not been conducted for hormone therapy, probably because most trials have shown no significant difference in response rates compared with contemporary endocrine therapies (Santen et al. 1990).