



## Platinum Priority – Collaborative Review – Bladder Cancer

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# The Economics of Bladder Cancer: Costs and Considerations of Caring for This Disease

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### Abstract

**Context:** Due to high recurrence rates, intensive surveillance strategies, and expensive treatment costs, the management of bladder cancer contributes significantly to medical costs.

**Objective:** To provide a concise evaluation of contemporary cost-related challenges in the care of patients with bladder cancer. An emphasis is placed on the initial diagnosis of bladder cancer and therapy considerations for both non-muscle-invasive bladder cancer (NMIBC) and more advanced disease.

**Evidence acquisition:** A systematic review of the literature was performed using Medline (1966 to February 2011). Medical Subject Headings (MeSH) terms for search criteria included “bladder cancer, neoplasms” OR “carcinoma, transitional cell” AND all cost-related MeSH search terms. Studies evaluating the costs associated with of various diagnostic or treatment approaches were reviewed.

**Evidence synthesis:** Routine use of perioperative chemotherapy following complete transurethral resection of bladder tumor has been estimated to provide a cost savings. Routine office-based fulguration of small low-grade recurrences could decrease costs. Another potential important target for decreasing variation and cost lies in risk-modified surveillance strategies after initial bladder tumor removal to reduce the cost associated with frequent cystoscopic and radiographic procedures. Optimizing postoperative care after radical cystectomy has the potential to decrease length of stay and perioperative morbidity with substantial decreases in perioperative care expenses. The gemcitabine-cisplatin regimen has been estimated to result in a modest increase in cost effectiveness over methotrexate, vinblastine, doxorubicin, and cisplatin. Additional costs of therapies need to be balanced with effectiveness, and there are significant gaps in knowledge regarding optimal surveillance and treatment of both early and advanced bladder cancer.

**Conclusions:** Regardless of disease severity, improvements in the efficiency of bladder cancer care to limit unnecessary interventions and optimize effective cancer treatment can reduce overall health care costs. Two scenarios where economic and comparative-effectiveness research is limited but would be most beneficial are (1) the management of NMIBC patients where excessive costs are due to vigilant surveillance strategies and (2) in patients with metastatic disease due to the enormous cost associated with late-stage and end-of-life care.

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## 1. Introduction

The direct medical costs of cancer care in the United States alone were estimated as approximately \$125 billion in 2010 [1]. Taking into account evolving population demographics and epidemiological trends in cancer, the price tag is expected to rise to nearly \$155 billion by 2020. The contribution of bladder cancer to trends in medical spending is significant. By the end of the decade, the disease is expected to account for >3% of all cancer-related medical payments.

One study estimated that the average medical costs associated with a diagnosis of muscle-invasive bladder cancer to be approximately \$150,000 [2]. Not surprisingly, most of these costs are incurred during the initial and terminal phases of the disease.

Costs associated with early stage (ie, non-muscle-invasive) disease have been more extensively evaluated. Because of the protracted clinical course of early stage disease, its prevalence relative to muscle-invasive cancer, and its procedure-oriented surveillance, the associated cumulative medical payments are generally thought to be even more substantial than those for more advanced disease [3]. Average per capita spending for early stage bladder cancer is increasing only slightly, from \$6936 for patients diagnosed in 1993 to \$7642 for those diagnosed in 2002. This growth has been driven by greater use of endoscopy and intravesical therapy [4].

It has also becoming increasingly evident that the care for patients with early stage bladder cancer varies considerably. This notion is underscored by the marked regional variation in spending for early stage disease in the first 2 yr after diagnosis, with per capita payments ranging from \$5594 to \$9554 [5]. Variation in spending at the provider level is even more dramatic. Physicians in the highest intensity quartile spend nearly three times as much for early stage bladder cancer patients than do those in the lowest quartile (\$7131 vs \$2830), even after adjusting for differences in disease severity [6]. These spending differences do not appear to reduce mortality or obviate the need for subsequent major interventions. In fact, there is a greater impact on the cost of care of non-muscle-invasive bladder cancer (NMIBC) based on the individual physician than on the stage and grade of disease [7]. However, a recent study of Medicare beneficiaries treated with radical

cystectomy for bladder cancer demonstrated improved survival with greater follow-up visits across low, medium, and high spending tertiles [8]. Therefore, increased attention is needed to improve the standardization of treatment and surveillance for bladder cancer patients to provide more cost-effective care.

The cost of care shows great variability depending on the health care system (Table 1). There is considerable variation across countries due to differences in practices such as inpatient or outpatient care, duration of hospitalization, methods of calculating costs and billing, cancer incidence, and the type and intensity of treatment and testing. Another source of variation in cost of care is the method of estimating economic efficiency. It is important to recognize the distinction of cost versus charge estimates. Charge refers to the use of patients' bills (charges) as a proxy for cost. However, because charge data incorporate profit margins, it is often a poor estimate of the cost or actual resource consumption.

In addition to the medical costs already cited, the broader, and perhaps more difficult-to-measure economic implications of bladder cancer are equally as noteworthy. Nonmedical costs associated with bladder cancer care, which take into consideration contributions such as lost productivity from time spent in and recovering from treatment, account for >\$100 million annually [9]. In contrast to those related to medical tests and procedures, however, these costs are borne by patients, their families, and their employers. Perhaps even most striking, the costs associated with an untimely death due to bladder cancer (ie, the "value" of life lost) approaches \$17 billion annually [10]. We review the contemporary published literature regarding the costs associated with management of bladder cancer according to disease stage and at various points in time of disease presentation.

One of the main issues related to the care of bladder cancer is that treatments and testing do not equate with equivalent benefit. Providers are generally more concerned with cost effectiveness than simply with cost. An expensive treatment that is effective is more acceptable than a cheap treatment that is slightly less effective. A major limitation to all cost analyses is the absence of data on the effectiveness of therapy. Bladder cancer is notorious for gaps in knowledge regarding treatment efficacy due to the absence of sufficiently powered randomized trials. This review

**Table 1 – Cost of bladder cancer care\***

	United States <sup>†</sup>	United Kingdom [72]	Sweden [86]	Germany [46]	Italy [87]
Office cystoscopy	163	520	165		
TURBT	4348	2362	2200	2500	2242
Single dose of MMC 40 mg	219	87	-	-	-
BCG 6 wk	528	630	-	-	975
Cystectomy	23 451	8090	20 570	15 419 <sup>‡</sup>	7222

BCG = bacillus Calmette-Guérin; MMC = mitomycin C; TURBT = transurethral resection of bladder tumor.

\* Costs are shown in euros.

<sup>†</sup> US Medicare rates.

<sup>‡</sup> As reported by Stenzl et al. [88].

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