

Cost analysis of clinic and office-based treatment of opioid dependence: Results with methadone and buprenorphine in clinically stable patients

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Abstract

The cost of providing and receiving treatment for opioid dependence can determine its adoption. To compare the cost of clinic-based methadone (MC, $n = 23$), office-based methadone (MO, $n = 21$), and office-based buprenorphine (BO, $n = 34$) we performed an analysis of treatment and patient costs over 6 months of maintenance in patients who had previously been stabilized for at least 1 year. We performed statistical comparisons using ANOVA and chi-square tests and performed a sensitivity analysis varying cost estimates and intensity of clinical contact. The cost of providing 1 month of treatment per patient was \$147 (MC), \$220 (MO) and \$336 (BO) ($p < 0.001$). Mean monthly medication cost was \$93 (MC), \$86 (MO) and \$257 (BO) ($p < 0.001$). The cost to patients was \$92 (MC), \$63 (MO) and \$38 (BO) ($p = 0.102$). Sensitivity analyses, varying cost estimates and clinical contact, result in total monthly costs of \$117 to \$183 (MC), \$149 to \$279 (MO), \$292 to \$499 (BO). Monthly patient costs were \$84 to \$133 (MC), \$55 to \$105 (MO) and \$34 to \$65 (BO). We conclude that providing clinic-based methadone is least expensive. The price of buprenorphine accounts for a major portion of the difference in costs. For patients, office-based treatment may be less expensive.

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1. Introduction

In 2000, it was estimated that heroin dependence cost the United States (U.S.) \$21 billion per year. Drug treatment expenses accounted for 5.7% of the total cost. Medical care including drug treatment and complications such as AIDS (23%), lost productivity (52.6%), and crime (23.9%) accounted for the largest portions of these cost (Mark et al., 2001). Annual costs for prescription opioid medication abuse in the U.S. are an estimated \$4.6 billion in the workplace, \$2.6 billion in health care, and \$1.4 billion to the criminal justice system (Birnbaum et al., 2006).

Methadone maintenance has an incremental cost-effectiveness ratio (ICER) of \$5915 per life-year gained

(Barnett, 1999). In health care cost-effectiveness analyses, these values indicate that methadone maintenance treatment would be considered a good investment for society (Zaric et al., 2000). These studies understate the full benefits, if the reduction in crime and spread of disease were to be included, the societal benefits would be greater. One cost-effectiveness analysis found that expanded access to methadone maintenance had an ICER of less than \$11,000 per quality-adjusted life-year (QALY) (Barnett, 2000). Cost to benefit ratios for methadone have been reported at 1:4 to 1:18 (Cartwright, 2000; Harwood et al., 1988).

In the U.S., in 2005, 235,836 individuals received methadone for treatment of opioid dependence. This represented 22% of all treatment admissions for opioids (Anonymous, 2006). The use of methadone for maintenance treatment is primarily restricted to federally licensed clinics (opioid treatment programs, OTPs), and to a small number of office-based physicians with special dispensation (Fiellin and O'Connor, 2002). For the 3-year

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period between January 2003 and December 2006, approximately 300,000 patients were treated with buprenorphine and/or buprenorphine/naloxone (Fiellin, 2007).

Buprenorphine and methadone maintenance have similar efficacy, although some findings demonstrate greater retention and less illicit drug use with methadone (Amato et al., 2005). Prior cost and cost-effectiveness studies of maintenance with methadone compared to buprenorphine have produced mixed results, partly because studies use an array of parameter estimates (Simoens et al., 2006). The annual cost of providing methadone maintenance treatment in an outpatient setting ranges between \$2000 and \$15,682 depending upon the level of services provided (Avants et al., 1999; Bradley et al., 1994; Roebuck et al., 2003; Rosenheck and Kosten, 2001; Harris et al., 2005; Doran et al., 2003; Zarkin et al., 2001). These costs are driven by regulatory (state and federal) requirements and guidelines from accreditation bodies (Center for Substance Abuse Treatment). These requirements result in a lower limit of costs that can increase based on a range of intensity of clinical contacts driven by such factors as the clinic's model of treatment and on patients' clinical status over time.

The Food and Drug Administration (FDA) approved two sublingual formulations of buprenorphine for the treatment of opioid dependence in 2002 (Fiellin et al., 2004). A waiver system enables physicians who have received 8 h of training in the treatment of opioid dependence to treat up to 100 opioid-dependent individuals in any setting in which they are licensed to practice (Substance Abuse and Mental Health Administration).

Cost is a potential barrier to the expansion of buprenorphine/naloxone. The monthly cost for buprenorphine/naloxone can be at least 10 times that for methadone (Anonymous, 2003). In fact, physicians who prescribe buprenorphine report cost as a challenge, most frequently, when asked about challenges to treatment (Substance Abuse and Mental Health Services Administration). Public and private funding programs variably include buprenorphine on the formulary. In addition, managed care programs contracted through Medicaid may have limited access to buprenorphine and the appropriate counseling services (Schackman et al., 2006). Thus, reimbursement for physician services, medication, and ancillary services can vary by state and insurance plan, leading to potentially restrictive out-of-pocket fees for patients and resistance by physicians (Clark, 2003).

Prior to the approval of buprenorphine for use in physician offices in the U.S. an economic model predicted that buprenorphine maintenance therapy would be similar (92%–114%) to the cost of methadone maintenance in the first year and (81%–97%) in subsequent years. The model reflected decreased service use after 1 year of treatment due to clinical stability. The model predicted that, when the patient-related costs of receiving treatment were considered, the cost of buprenorphine would be lower than the cost of methadone in the first year (54%–76%) and in subsequent years (44%–64%). The authors predicted, however, that costs for buprenorphine could increase, in comparison to methadone, if socially stabilized patients (e.g., employed, married, fewer adverse effects from addiction) were attracted to buprenorphine (Rosenheck and Kosten, 2001).

Office-based treatment with methadone and buprenorphine are available in selected countries internationally (Fiellin and Strain, 2005). One advantage of physician office-based treatment is that patients with comorbid medical or psychiatric conditions (e.g., hepatitis or depression) can have these issues addressed by the same physicians who provide their substance abuse treatment. In the United States, treatment guidelines recommend socially stable, less medically and psychiatrically complex patients for office-based treatment with methadone or buprenorphine (Substance Abuse and Mental Health Services Administration, 2004, 2007b). To date, there have been no reports that present the actual costs associated with providing buprenorphine treatment, compared to office or clinic-based methadone, in the U.S. based upon data obtained in patients receiving this treatment. In addition, there have been no reports that compare the cost incurred by patients receiving either methadone or buprenorphine in these settings. The purpose of the current study was to determine which treatment; clinic-based methadone, office-based methadone, or office-based buprenorphine was least expensive in clinically stable patients.

2. Methods

2.1. Overview

We performed an analysis of costs obtained in two prior evaluations of patients receiving three types of care; clinic-based methadone (MC), office-based methadone (MO), or office-based buprenorphine (BO). Data were collected during the conduct of a clinical trial (Fiellin et al., 2001) and an extension phase of an observational study (Fiellin et al., 2008). Our goal was to determine if MC, MO, or BO is least expensive from the perspective of treatment providers and patients.

2.2. Study design and patients

Patients receiving methadone were enrolled in a clinical trial assessing the relative effectiveness of maintenance in two settings: (1) office-based primary care settings, and (2) a federally licensed methadone clinic (Fiellin et al., 2001, 2006). Patients had been in treatment at the clinic for at least 1 year. Patients were between the ages of 18 and 60 years, had no urine toxicology screenings positive for illicit opioids or cocaine in the previous 12 months, had no significant psychiatric or medical condition, at the time of entry into the studies they had no evidence of dependence, via the Structured Clinical Interview for DSM Disorder (American Psychiatric Association, 1994), on cocaine, alcohol or drugs other than opioids. Patients were required to have a legal income, consistent residence, transportation to and from the treatment site, anticipate continuing maintenance treatment for at least 12 months. Forty-seven patients were randomized to continue to receive methadone maintenance in the clinic (MC) ($n = 25$) or to receive office-based methadone (MO) at a primary care physician's office ($n = 22$). For the purposes of the cost analysis, we confined our analysis to the 44 patients who provided at least one urine sample for toxicology screening during the 6-month study period included in the current study. Data were collected between February 1999 and March 2000.

Patients receiving buprenorphine were enrolled in an observational cohort study of office-based buprenorphine (BO) maintenance therapy. Patients in this cohort were opioid-dependent adults who had no evidence of psychosis, major depression, or a life-threatening medical problem, were able to understand English, and were not dependent upon alcohol, benzodiazepines, or sedatives. Women in the cohort agreed to use contraception and pregnancy monitoring. Patients included in this cost analysis had also demonstrated clinical stability, with infrequent opiate use (13% of 1022 urine samples positive for opiates), during the prior 12-month period. We included data from the 34 patients in the cohort who provided at least one urine sample for toxicology screening over a

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