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Establishing the Feasibility of Measuring Performance in Use of Addiction Pharmacotherapy

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Abstract

This paper presents the rationale and feasibility of standardized performance measures for use of pharmacotherapy in the treatment of substance use disorders (SUD), an evidence-based practice and critical component of treatment that is often underused. These measures have been developed and specified by the Washington Circle, to measure treatment of alcohol and opioid dependence with FDA-approved prescription medications for use in office-based general health and addiction specialty care. Measures were pilot tested in private health plans, the Veterans Health Administration (VHA), and Medicaid. Testing revealed that use of standardized measures using administrative data for overall use and initiation of SUD pharmacotherapy is feasible and practical. Prevalence of diagnoses and use of pharmacotherapy varies widely across health systems. Pharmacotherapy is generally used in a limited portion of those for whom it might be indicated. An important methodological point is that results are sensitive to specifications, so that standardization is critical to measuring performance across systems.

Keywords

performance measurement; pharmacotherapy; addiction medication; Veterans Health; Medicaid

1. Introduction

Pharmacotherapy for substance use disorders (SUD) is an evidence-based practice widely recognized as a critical component of addiction treatment, and recommended by clinical experts and policymakers for consideration in treating any alcohol or opioid dependent patient (Center for Substance Abuse Treatment 1998; Center for Substance Abuse Treatment 2004; National Quality Forum (NQF) 2005; National Quality Forum (NQF) 2007; Center for Substance Abuse Treatment 2009; Ries, Miller et al. 2009; Un 2009; American Medical Association (AMA) July 2008). Currently, medications approved by the U.S. Food and Drug

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Administration (FDA) for treatment outside of a licensed methadone treatment program include: short acting and extended-release naltrexone, disulfiram, and acamprosate for alcohol dependence; and buprenorphine, and short acting and extended-release naltrexone for opioid dependence.

Outpatient addiction pharmacotherapy is still limited in use, but has now been adopted by a range of providers (Thomas, Reif et al. 2008; Mark, Kassed et al. 2009; Stein, Gordon et al. 2012). Pharmacotherapy use is closely tied to coverage and reimbursement, and some states and many private insurers now provide coverage for addiction medications (Gelber S. 2008; Horgan, Reif et al. 2008; Rieckmann, Kovas et al. 2010). Adoption may further be driven by increasing evidence for the cost-effectiveness of several medications, particularly extended release naltrexone, (Zarkin, Bray et al. 2008; Mark, Montejano et al. 2010; Baser, Chalk et al. 2011; Bryson, McConnell et al. 2011; Jan, Gill et al. 2011) and buprenorphine (Barnett, Zaric et al. 2001; Baser, Chalk et al. 2011; Clark, Samnaliev et al. 2011).

While adoption of SUD pharmacotherapy has been slow, documenting its use by standardized performance measures is an important potential means of ensuring access to it. Performance measures -- methods or instruments to monitor the extent to which the actions of a health care practitioner or provider conform to practice guidelines, medical review criteria, or standards of quality (Academy Health 2004) -- are used widely by health services organizations to identify problems, justify the allocation of resources, and improve quality of health care (Institute of Medicine 2006). Development and acceptance of standardized evidence-based measures is a critical step in the path toward benchmarking and driving improvement by raising public awareness, reporting of timely information, implementing systems to reward quality, and promoting leadership in use of evidence based practices (Galvin and McGlynn 2003; Horgan and Garnick 2005). In addition, by increasing the collection and availability of healthcare data, the Patient Protection and Affordable Care Act (ACA) will increase opportunities for measuring performance and improving quality of care (111th Congress 2010). There is growing consensus in the research and policy communities around the need for performance measures in various settings including Medicaid and integrated care practices (Zerzan, Morden et al. 2006; Kaiser Commission on Medicaid and the Uninsured 2011; Roski and McClellan 2011; Shields, Patel et al. 2011).

Though performance measurement is widely used in health care and is integral to health reform efforts to enhance accountability, the substance abuse field has lagged behind the medical arena in developing measures of performance (Horgan and Garnick 2005; Pincus, Spaeth-Rublee et al. 2011). Several public and private substance abuse treatment systems and organizations are engaged in measuring basic use of pharmacotherapy. However, no standardized performance measures are available to assess the use of SUD pharmacotherapy, in spite of the evidence and endorsement of this practice by clinical experts and policymakers (Thomas, Garnick et al. 2011). The Washington Circle (WC) (www.washingtoncircle.org), a group of professionals dedicated to the advancement of substance abuse performance measures, developed the widely used and HEDIS®-adopted process measures of initiation and engagement in substance use disorder (SUD) treatment (Garnick, Lee et al. 2002; National Committee for Quality Assurance 2011). The WC has recently specified a new set of performance measures for the use of pharmacotherapy in the treatment of substance use disorders, specific to treatment of alcohol dependence and opioid dependence with FDA-approved prescription medications for use in office-based general health and addiction specialty care settings.

This paper demonstrates the rationale and feasibility of using the Washington Circle SUD pharmacotherapy measures, through pilot testing in three different types of systems: private health plans (commercial insurance); the Veterans Health Administration; and Medicaid.

These measures can be derived from administrative claims, encounter data or electronic health records. The pharmacotherapy measures presented and pilot tested here are complementary to the widely used process measures for identification and engagement of SUD treatment included in HEDIS® reporting, used in public settings (Garnick, Lee et al. 2009; Harris, Kivlahan et al. 2010; Garnick, Lee et al. 2011), and endorsed by the National Quality Forum (NQF) (National Quality Forum (NQF) 2010).

1.1 Rationale for process measures for SUD pharmacotherapy

The most appropriate type of measure that is the for assessing performance is a source of considerable debate (Jencks, Cuerdon et al. 2000; Purbey, Mukherjee et al. 2007). While structural measures are a good starting point when evaluating quality of care (e.g., does a clinic have adequate personnel to prescribe and monitor medications?), they are rarely sufficient for comprehensive measurement because they only identify if an organization has the capacity to provide a service. With respect to SUD pharmacotherapy, structural measures characterize elements necessary for treatment, but do not capture the extent of use. Furthermore, structural components such as staffing and certification are often managed through public and private accreditation (Kresina, Litwin et al. 2009). Outcome measures look at the impact of treatment on patients' health status, functional ability, and impact on society (e.g., productivity, decreased criminal activity). While variations in outcomes may be due to differences in treatment quality, outcomes in particular are at risk for confounding by patient characteristics and other non-health system factors. In addition, outcome measures may not accurately reflect the quality of care received, only whether or not a desired result was achieved (Brook, McGlynn et al. 2000).

Alternatively, process measures cannot capture every aspect of a practice, nor explain all variance in organizational factors, but they have some advantages over other types of quality indicators (Mant 2001; Krumholz, Normand et al. 2007). It is easier to improve health care processes than outcomes, as process measures are more dependent on the activities of the provider. In substance abuse treatment, professional and provider organizations have specified different process measures to assess use of office-based pharmacotherapy. The American Medical Association (AMA) Physician Consortium for Process Improvement (PCPI) has designed process measures focusing on offering pharmacologic treatment option for SUD patients (AMA July 2008). These document the proportion of patients with opioid or alcohol dependence "who were counseled regarding psychosocial AND pharmacologic treatment options for [alcohol or opioid] dependence within the 12-month period." The AMA measures rely on current procedural and terminology (CPT) administrative codes specific to counseling related to pharmacotherapy that were recently adopted by the AMA for reimbursement, but are not yet widely used. Other process measures that have been used in research and program evaluation within the Veterans Health Administration (VHA) focus on the percent of patients with an alcohol use disorder who receive any FDA approved medication and a parallel measure for opioid dependent patients (Harris, Kivlahan et al. 2010; Fernandes-Taylor and Harris 2012). However, standardized measures that are applicable across health and data systems would provide a baseline for understanding the range of current practice and for measuring improvement.

1.2 Conceptualization: Goals and scope of a pharmacotherapy measure set

The main goal of this research was to create and demonstrate the feasibility of performance metrics that are suitable for use across a broad range of general and behavioral health settings to assess SUD pharmacotherapy. The Washington Circle Pharmacotherapy Work Group developed these measures cognizant of the importance of ease of use, including flexibility with respect to administration, data sources and settings, to encourage their implementation. Therefore, the measures are applicable for use in claims, encounter and

electronic health records, and are intended for use at the health plan, organization or provider group level. The measures are designed to be applicable for both opioid and alcohol dependence, with the potential to report and analyze different components of measures separately. The measures are intended to reflect both overall use and initiation of pharmacotherapy at the onset of a treatment episode. The measures are specified for application in adult populations, as limited evidence exists for use among adolescents (Waxmonsky and Wilens 2005; Deas 2008). Because there are varied approaches to duration of use of either alcohol or opioid maintenance medications (e.g., daily, targeted days, short-term taper or longer term maintenance) (Ries, Miller et al. 2009), this aspect of care is not included in the measure at this time.

This measure set is also consistent with NCQA SUD initiation and engagement measures, to provide the option to report these together for a broader perspective on the care process. Furthermore, the measures are intended to focus on actual use of pharmacotherapy for SUD, rather than related counseling, offers of pharmacotherapy, or written prescriptions that are not filled. Because administrative coding for counseling or offering pharmacotherapy are not yet widely used or validated, assessing likely use through filed administrative claims for medications may be more useful at present.

2. Materials and Methods

Measures were developed and refined through the following steps: conceptualization; literature review; specification of proposed measures; review of measures; pilot test of measures, with various iterations, and review. Results of each step were reviewed by a national panel of expert clinicians, researchers and policymakers (the 'Washington Circle Pharmacotherapy Work Group'). Measures are listed in Table 1, and summarized below.

2.1 Measure 1: Overall use of SUD pharmacotherapy

This measure summarizes the number and percentage of adults with a claim associated with a defined diagnosis of alcohol or opioid dependence, separately, during a measurement year, who received appropriate pharmacotherapy.

2.2 Measure 2: Initiation of pharmacotherapy upon a new episode of alcohol/ opioid dependence

The initiation measure summarizes the number and percentage of adults with a claim associated with a new episode of alcohol dependence during a measurement year, who received appropriate pharmacotherapy within 30 days. A new episode was defined in accordance with current NCQA standards (i.e., no SUD claims in the previous 60 days). While it is possible that the decision to initiate pharmacotherapy may be preceded by several consultation visits, the 30 day time period from episode onset to treatment was selected to reflect a strict standard of prompt initiation. The NIAAA recommends initiating pharmacotherapy for alcoholism treatment concurrently with initiation of psychosocial treatment, rather than including a waiting period or "fail first" period (National Institute on Alcohol Abuse and Alcoholism (NIAAA) 2006). Note that the medication initiation measure is only relevant to new treatment episodes.

2.3 Pilot test methods

The purpose of pilot testing was to evaluate measures in different care settings and assess their feasibility. Testing also addressed different iterations of each measure. The pilot testing was designed to establish baseline values in various populations. In order to be consistent with NCQA substance use disorder initiation and engagement measures in terms of denominator population and scope, coding was consistent with population and diagnostic

criteria they used in 2007 (National Committee for Quality Assurance 2012). Throughout the development and testing, constructive review from the WC Pharmacotherapy Work Group was used to refine measures and ensure consistency with previous SUD related performance measures.

2.4 Data

Measures were tested using medical and pharmacy claims from the following VHA and *Thomson Reuters MarketScan® Research* databases, a proprietary U.S. healthcare database that contains de-identified, person-level healthcare claims data. (Truven Health 2012)

- MarketScan® Commercial Database: over 11 million privately insured individuals ages 18–64, from 2006–2007. As the largest warehouse of employer-based patient data in the United States, this database contains claims from all care settings from hospitals to pharmacies. The database consists of annual, person-level medical and drug data from employer and health plans nationwide and contains eleven million MarketScan private members per year for years 2006 and 2007.
- MarketScan® Multi-State Medicaid Database: over 800,000 Medicaid beneficiaries ages 18–64, from 2006 and 2007. Medicaid administrative claims from at least three states were aggregated and states were de-identified, according to MarketScan® requirements. However, each of the states included in the study contained beneficiaries with at least one claim for each medication of interest, to ensure that selected states provided coverage of SUD medications.
- Veterans Health Administration data base: over five million individuals covered by the Veterans' Health Administration, age 18 and older, for the years 2006 and 2007.

Data for all sources combined hospital and outpatient medical services with pharmacy claims at the patient level, and included all diagnoses, dates of service, type of service, date of prescription, and drug name.

2.5 Denominator population

We limited our analysis to adults age 18 and older who maintained insurance enrollment for a full 12 months (i.e., no death or disenrollment during the year). For the Veterans administration, all adults age 18 and older were included; for MarketScan, data were limited to individuals age 18–64, as MarketScan commercial data are incomplete for individuals age 65+, because they are partially covered by Medicare (for which claims were unavailable). Mandating a full 12 month enrollment assures consistent capture of all services over time. The study also tested different denominators (i.e., more or less expansive, restricting diagnosis codes to “dependence” only or including either “abuse” or “dependence”).

2.5.1 Relationship of visits to medication use—Identifying the proper denominator population in each system is a critical point in measure specification. Figure 1 indicates the overlapping relationship between medication utilization and other services that is observable in claims data. Individuals on medication may or may not have a related diagnosis observable via claims; conversely, only a portion of the individuals with a diagnosis visit have associated counseling, or medications. For this study, we identified individuals with specific SUD diagnoses that were appropriate for office-based pharmacotherapy (opioid dependence and alcohol dependence). To identify individuals with SUD claims, service types were chosen that were compatible with existing SUD initiation and engagement measurement specifications (e.g., outpatient services and inpatient services). Detailed specifications used in the pilot test are available from authors.

While conceptually, it may be that a medication visit is preceded or first occurs simultaneously with a diagnosis visit, it is not always the case, especially when using administrative claims. The measure was applied only within the subset of individuals who had a relevant diagnosis in the measurement year. However, exploratory analyses were also conducted to determine the impact of this decision on utilization (i.e., how many individuals had a medication and no diagnosis).

2.5.2 Denominator diagnoses within services, procedures and encounters—

The specific denominator diagnoses for alcohol and opioid treatment were chosen in accordance with current FDA-approved indications, though a goal of the pilot was to test the sensitivity of other denominator definitions. For instance, for the alcohol pharmacotherapy measure, *alcohol dependence* was the initial focus, as *alcohol dependence* is consistent with the FDA approval for office-based alcohol treatment medications naltrexone (short or long acting), acamprosate, and disulfiram. However, recognizing that coding is often non-specific, though, we tested the sensitivity to expanding the definition for the denominator to include the broader definition (i.e. including either *alcohol abuse or dependence* diagnoses rather than limiting to alcohol dependence alone), using the *MarketScan*® private claims and Medicaid data prior to the final application of the measure across all three systems.

Similarly, *opioid dependence* was used to define the denominator population, consistent with the FDA-approved indication. In addition, individuals identified with the diagnosis combinations of opioid type drug with any other drug dependence, unspecified use were included. Individuals with both relevant alcohol and drug diagnoses were included in each of the measure denominators.

2.5.3 Exclusions—Performance measures commonly exclude individuals if the treatment being measured is contraindicated. In the cases of both opioid and alcohol treatment pharmacotherapy, while there are certain contraindications for specific drugs, at least one medication was available for the majority of individuals being treated. For instance, regarding alcohol treatment medications, liver failure is a potential contraindication for naltrexone, but not for acamprosate, so no exclusions were applied.

2.6 Numerator population: Identifying medication use

Pharmacy claims were used to identify evidence use of oral medications at any point during the measurement year: naltrexone (short or long acting), acamprosate, or disulfiram for alcohol dependence treatment, and buprenorphine for opioid dependence treatment. Specific coding for the numerator medications varied across systems, as each insurer/provider uses a variation of National Drug Codes (NDCs) for their particular administrative data. Medications were also identified through medical service healthcare common procedure coding system (HCPCS) codes, to identify injectables (i.e., long-acting injectable naltrexone).

The final measures for testing focused on individuals with diagnoses of alcohol dependence (ICD-9-CMdiagnosis codes: 303.90–303.92) or opioid dependence, with or without other nonspecific drug dependence (ICD-9-CMdiagnosis codes: 304.00–304.02; 304.70–304.72), receiving care in general medical (office and hospital outpatient), addiction specialty care, emergency department and rehabilitation settings. For pharmacotherapy use at any time during the year (measure 1), all 12 months of each year were included, regardless of timing of pharmacotherapy in relation to medical visits. For initiation of pharmacotherapy at the onset of an episode (measure 2), visits were counted starting 60 days into the measurement year (to allow for 60 days prior with no treatment), through the 11th month of the measurement year (to allow 30 days for pharmacotherapy initiation). The impact of applying

different time periods between initial visit and initiation of medication therapy were also examined using the *MarketScan*® data.

The draft measures were applied in each data set. Several iterations of specifications were considered. Since these measures are intended to be applied in a range of non-methadone outpatient settings, the use of methadone for opioid maintenance treatment, which is only provided for SUD treatment through a licensed narcotic treatment program, was not a goal of the measure. However, methadone and buprenorphine can be used for pain management, especially in individuals with cancer or chronic nonmalignant pain (Malinoff, Barkin et al. 2005; Manfredonia 2005), and so it is observed in claims data for individuals not under addiction treatment. Patients with claims for methadone and/or buprenorphine injectable were, therefore, not excluded from pilot testing, but the existence of methadone in claims data was not considered treatment of substance abuse, because of its being limited to use in licensed programs (Fiellin, O'Connor et al. 2001) and coverage through insurance and identification through administrative claims was thought to be inconsistent.

3. Results

Table 2 summarizes the population in each dataset and overall prevalence of disorders. The populations varied by age and gender, with Medicaid having more females, and slightly older than the private population, and the VHA being older and over 90% male. The prevalence of the broad range of any alcohol or other drug disorder diagnoses across the health system settings in this study ranged from less than 1% in privately insured population to over 6% in the VHA. The population with alcohol dependence varied more than 10-fold, from 0.2% of total members in privately (commercially) insured patients to 2.9% in the VHA. Expanding the definition of alcohol disorders to ‘dependence or abuse’ approximately doubled the population identified with alcohol disorder in all systems. Diagnoses of opioid dependence also differed 10-fold across data sources, ranging from 0.06% in privately covered individuals, to 0.4% in Medicaid and the VHA.

3.1 Overall use of pharmacotherapy

Tables 3a and 3b present the overall rates of use of pharmacotherapy in the measurement year, a count of the number of individuals with evidence of one or more claim for pharmacotherapy divided by the number of individuals in the data during the measurement year with an alcohol or opioid dependence encounter. Again, the variation across plans is striking. Private plans have an alcohol pharmacotherapy use rate of around 15%, followed by Medicaid with 7%, and VHA with 2.6%. In the *MarketScan*® data, the impact of expanding the denominator to abuse or dependence was assessed (data not shown in table). Because a smaller number of individuals with alcohol abuse alone received pharmacotherapy, the broader definition of alcohol disorders decreased prevalence of pharmacotherapy from approximately 15 to 10% in private systems, and from 7% to 4% in Medicaid. It should be noted that in testing different specifications in the *MarketScan*® data, about half of individuals with some evidence of a SUD medication claim had no diagnosis related to the medication, so they were excluded from the denominator in the analysis.

For opioid dependence, buprenorphine use rates for those diagnosed with opioid dependence were higher than alcohol pharmacotherapy use rates, and differed across systems. In private plans, a surprisingly high proportion of the diagnosed population (27–34%) received pharmacotherapy, compared to 5 to 7% in Medicaid and 8% in the VHA. Use of pharmacotherapy for opioid dependence was approximately twice the rate of alcohol dependence pharmacotherapy in both private plans and the VHA.

Although methadone is not indicated for SUD treatment as dispensed outside of an approved program, we also explored the impact of excluding methadone users from the analysis, or including methadone as evidence of opioid treatment pharmacotherapy using the *MarketScan*® data. Seven to ten percent of individuals with opioid dependence had some evidence of methadone treatment in the measurement year. Including methadone as a SUD pharmacotherapy in 2007 would increase overall pharmacotherapy use rates from 34 to 37% in private claims, and 7–9% in Medicaid. Excluding methadone users from the opioid dependence denominator increased opioid pharmacotherapy use rates similarly. As with alcohol pharmacotherapy, about half of individuals with a medication had no evidence of diagnosis, so were not included in numerator of overall use.

3.2 Initiation of pharmacotherapy after index visit

Rates of initiation of pharmacotherapy were assessed at 30 days after an index visit (Tables 4a and 4b). For pharmacotherapy for alcohol dependence, rates of initiation within 30 days in private claims were approximately ten percent of new visits, compared to 2.5% in Medicaid, and one percent in the VHA. While the expert panel chose 30 days for initiation of pharmacotherapy to be consistent with good practice, alternative initiation specifications were tested in the private and Medicaid populations. Relaxing the initiation timing requirement from 30 to 60 days illustrates the sensitivity of results to variation in specifications: for alcohol treatment, pharmacotherapy initiation rates of 9.7% and 10.2% in the private sector increase about one percentage point, as does the 2.5% in Medicaid.

For opioid treatment, pharmacotherapy was initiated within 30 days 13% to 19% of the time in private plans, 2% to 4% in Medicaid, and 4–5% in the VHA. Similar to the alcohol initiation measure, rates were sensitive to the 30 day requirement, as indicated by testing in private plans and Medicaid, but again a small amount. When changed to 60 days, rates in the private sector increased generally less than one percentage point for each population.

4. Discussion

This is the first time that standardized performance measures for use of SUD pharmacotherapy have been applied in national data across a disparate set of covered populations. This study establishes that a uniform standardized performance measure for use of pharmacotherapy is feasible and sensitive to variations in overall use and initiation across populations. We found pharmacotherapy use, especially alcohol treatment medications, in a small proportion of those diagnosed. We also found that pharmacotherapy use and initiation rates are generally higher for opioid treatment than for alcohol treatment.

The difference in pharmacotherapy use by type of disorder (lower use for alcohol dependence medications than opioid dependence medications) may reflect the perceived limited effect demonstrated for alcohol treatment medications compared to efficacy of opioid treatment medications, and thus limited interest by some providers (Ries, Miller et al. 2009). As more information is available on pharmacogenetics of alcoholism treatment, medication use may increase as they become better targeted to appropriate patients (McCaul and Monti 2003). Surprisingly, almost a third of individuals in commercial insurance with opioid dependence have evidence of being dispensed buprenorphine. It may be in part that individuals seek office-based medical care for opioid disorders with the express goal of obtaining buprenorphine. No studies are available to compare these levels outside of the current data, though access to buprenorphine has expanded dramatically in the past decade (Arfken, Johanson et al. 2010). However, the level of buprenorphine use in this study for the Veterans' Health Administration, lower than that of commercial plans, is consistent with that found in more recent studies of the administrative data used here (Oliva, Harris et al. 2012; Oliva, Gordon et al. (in press)).

Higher use of SUD pharmacotherapy in some health systems is consistent with the market environment. Greatest use was identified in the commercial data covering privately insured patients, in which SUD pharmacotherapy is increasingly widely available on formularies (Horgan, Reif et al. 2008; Un 2009; Thomas, Garnick et al. 2011), in spite of remaining barriers to adoption by individual physicians (Thomas, Reif et al. 2008; Albright, Ciaverelli et al. 2010; Ling, Jacobs et al. 2010; Oliva, Maisel et al. 2011; AMA July 2008). Limited use of pharmacotherapy in the VHA is consistent with an earlier study of alcohol treatment in 2007, which used a broader definition to identify alcohol disorders (Harris, Kivlahan et al. 2010).

The current measure set is based on systematically identifying a homogeneous diagnosis-based treatment population prior to applying performance measures. The identified prevalence of any SUD disorder in private health plans in the current study (less than one percent), is consistent with that reported directly from selected health plans in an earlier study (Garnick, Lee et al. 2002), and considerably lower than that found in either the Medicaid or VHA data. The wide range of SUD prevalence apparent between private plans, the VHA, and Medicaid highlights a potential limitation of cross-system comparisons, where varying screening policies may limit comparability of denominator populations. Low apparent prevalence in commercial claims for privately insured individuals may indicate reluctance by providers to assign an addiction-related diagnosis in this population, unless starting pharmacotherapy. At the same time, the VHA supports strong screening programs, which may identify and assign more individuals SUD diagnoses who are perhaps less severe or at an earlier stage in treatment. As a result, private claims might show lower prevalence but higher use of pharmacotherapy for those diagnosed. In the VHA, more than 10 times more individuals receive diagnoses for alcohol dependence than in private plans (the population is considerably different as well, and includes individuals age 65 and older). Nevertheless, the VHA actually dispenses medications for alcohol dependence to a greater portion of their entire patient population than the rates of use of medications found in the other data sources represented here. Thus, potential differences in screening and diagnosing patterns across health systems may limit the comparability of case-based pharmacotherapy use rates. However, an overall population-based rate based on an intent-to-treat approach (measuring the proportion of population who is treated with medications, without respect to diagnosis) would omit important population differences, and the rates would perhaps be too low for useful comparisons (generally less than one tenth of 1% in the current study).

Finally, the minimal use of pharmacotherapy of both alcohol and opioid addiction in Medicaid programs may be explained by their policies restricting access to buprenorphine. Because the specific states used for Medicaid analyses in this pilot test were de-identified and aggregated, it is not clear what policies were in place. However, while there is evidence that buprenorphine use is also increasing in Medicaid populations, only nine percent of new opioid dependence treatment episodes in a Medicaid behavioral health program involved buprenorphine in 2007 (Stein, Gordon et al. 2012).

While research to date supports the utilization and effectiveness of office-based pharmacotherapy for SUD, the decision on the part of the client to accept treatment is complex. Patients may initially be resistant to start medication therapy and require multiple physician consultations. Therefore, measures must be flexible and take into account time lags that may occur between initial presentation for treatment and the first presence of a medication. As reported here, and as noted by others, performance results are sensitive to the precise specifications of a measure (Harris, Humphreys et al. 2009; Fernandes-Taylor and Harris 2012). Changing the definition of the denominator population (or relaxing the measure to include multi-years of diagnosis), changing the timing of initiation, excluding methadone users from the denominator (or including them in the numerator as “treated”),

can change performance rates in either direction by 25% or more. Fernandes-Taylor's 2011 comparison of several pharmacotherapy specifications in the VHA suggests that a prior year's trial of pharmacotherapy might accurately identify individuals who would appear in a single year through the current method as "untreated" (The VHA study included individuals with alcohol abuse or dependence, and treatment includes activity in a prior year, while the current study limited individuals to a dependence diagnosis and treatment in the current year.) In the same way, our finding of individuals on SUD pharmacotherapy with no diagnosis in the measurement year could reflect earlier diagnoses that were not picked up using one year of data. However, because a critical foundation of a measure is its practical implementation and harmonization with other accepted SUD process measures, a single year was chosen for this measure.

An additional limitation of these measures is that they do not include an adherence or continuation component. In initial testing, there was a wide variation in persistence of use, particularly for opioid treatment pharmacotherapy. As noted earlier, lack of consensus exists as to the appropriate duration of treatment of either alcohol or opioid pharmacotherapy. While evidence in alcohol treatment suggests that adherence over three months is associated with strong and consistent improvements in outcomes (Pettinati, Volpicelli et al. 2000; Baros, Latham et al. 2007; Kranzler and Gage 2008), trials suggest that naltrexone can also be effective on a "targeted" basis (Heinala, Alho et al. 2001; Kranzler and Rosenthal 2003). Similarly, buprenorphine can be used for either short term detoxification or longer term maintenance (Amass, Ling et al. 2004; Ries, Miller et al. 2009).

The field of performance measurement is constantly evolving, as is the availability of medications for treating SUD disorders. It should be noted, for instance, that in 2010 naltrexone extended release received approval for treatment of opioid dependence, and additional revenue codes were approved by the American Medical Association for offering of pharmacotherapies for alcohol, opioid and tobacco dependence. Future efforts should focus on refining measures and implementing them in various populations over time. In addition, SUD pharmacotherapy measures should be expanded to reflect rates of the appropriate use of other treatment services such as counseling and primary care. In the past decade, there has been an increased focus on the importance of integrating behavioral health and primary care because individuals seeking substance abuse treatment have unique health care needs beyond therapy for their SUD. Care received in integrated settings may also be associated with higher initiation and engagement rates (Weisner, Mertens et al. 2001; Post, Metzger et al. 2010; Gurewich, Sirkin et al. 2011). As the number of accountable care organizations (ACOs) and other integrated care settings grows, there will be an increased demand for measures that can be efficiently implemented in these environments using available data to assess treatment provided not only by SUD specialists but also by non-specialists as well. Data obtained through measurement will be important for quality improvement but, also for cost-effectiveness and comparative effectiveness purposes.

Considering the fact that SUD pharmacotherapy is a widely recommended evidence-based practice, the use of performance measurement may stimulate consideration of this treatment. While the measures here are applicable in electronic health records as well as administrative data, the availability of rich clinical information in electronic health records could provide an opportunity to further refine these measures, linking process performance to health care utilization and outcomes, and validating measures. However, prior research has shown that for the 2006 HEDIS Initiation and Engagement measures, rates of concordance between diagnosis and procedure codes in charts and administrative data can vary by SUD treatment setting and is higher in addiction specialty settings (Harris, Reeder et al. 2011). One of the advantages of the Washington Circle measure set presented in this paper is that it relies on pharmacy data rather than clinical notes regarding intent to prescribe. In addition, with full

implementation of the International Classification of Diseases, Tenth Revision (ICD-10-CM) in the near future (Centers for Disease Control and Prevention 2012), new specifications will need to be updated as new codes and medications become available. It is unclear how, if at all, new diagnostic codes will impact the classification of substance use disorders but, it is likely that the implementation of ICD-10 codes will be challenging for providers and payers. The development of a feasible, cost-effective suite of measures that are widely adopted will ensure that data are comparable across environments.

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Figure 1.
Relationship between pharmacotherapy and substance use disorder related visits

Table 1

Measure specifications

1. Overall pharmacotherapy use	
a. Alcohol treatment pharmacotherapy treatment use measure	
Numerator	<i>Number of individuals with at least one prescription for appropriate pharmacotherapy at any time during the measurement year</i>
Denominator	<i>Number of individuals with any encounter associated with an alcohol dependence diagnosis (primary or other) at any time during the measurement year</i>

b. Opioid treatment pharmacotherapy use measure	
Numerator	<i>Number of individuals with at least one prescription for appropriate pharmacotherapy at any time during the measurement year</i>
Denominator	<i>Number of individuals with any encounter associated with opioid dependence (primary or other) at any time during the measurement year</i>

2. Initiation of pharmacotherapy	
a. Alcohol treatment pharmacotherapy initiation measure	
Numerator	<i>Number of individuals who initiate pharmacotherapy with at least one prescription for an alcohol treatment medication within 30 days following index visit with a diagnosis of alcohol dependence</i>
Denominator	<i>Number of individuals with index visit associated with an alcohol dependence diagnosis after 60 day clean period with no SUD claims</i>

b. Opioid treatment pharmacotherapy initiation measure	
Numerator	<i>Number of individuals who initiate pharmacotherapy with at least one prescription for an opioid treatment medication within 30 days following index visit with a diagnosis of opioid dependence</i>
Denominator	<i>Number of individuals with index visit associated with an opioid dependence diagnosis after 60 day clean period with no SUD claims</i>

Descriptive statistics for each population, 12 month enrollees ages 18–64, with diagnosis and use in measurement year

Table 2

Age 18–64 (18+ for VHA), enrolled full 12 months of measurement year	MarketScan® Private health plans		MarketScan® Medicaid (3+ states combined)		Veterans Health Administration	
Measure	2006	2007	2006	2007	2006	2007
Total n in insured population	11,141,967	11,955,508	837,801	860,208	5,085,104	5,120,278
Average (mean) age, years	40.8	41.2	43.7	43.7	62.6	62.5
Percent female	35.0%	36.6%	43.2%	44.8%	8.30%	8.50%
N (% of population) with any alcohol or other drug disorder based on measure specifications	55,821 (0.5%)	66,993 (0.6%)	35,575 (4.2%)	41,132 (4.8%)	295,418 (5.8%)	313,867 (6.1%)
N (% of population) with alcohol dependence based on measure specifications	20,419 (0.2%)	23,352 (0.2%)	8,052 (1.0%)	9,393 (1.1%)	143,377 (2.8%)	148,111 (2.9%)
N (% of population) with alcohol abuse or dependence based on measure specifications	36,830 (0.3%)	44,217 (0.4%)	16,713 (2.0%)	19,725 (2.3%)	270,311 (5.30)	283,779 (5.5%)
N (% of population) with an opioid dependence encounter	7,135 (0.06%)	9,359 (0.08%)	3,788 (0.5%)	4,654 (0.5 %)	21,687 (0.4%)	22,673 (0.4%)

Table 3

a: Alcohol Pharmacotherapy Use					
Alcohol measure: Age 18–64, 12 month enrollees	MarketScan® health plans		MarketScan® Medicaid (3+ states combined)		Veterans Health Administration
	2006	2007	2006	2007	2006 2007
N with an alcohol dependence encounter	20,149	23,352	8,052	9,393	142,377 148,111
N (%) of individuals with alcohol dependence who have at least one claim for any alcohol treatment medicine during measurement year	3,301 (16.4%)	3,640 (15.6%)	565 (7.0%)	652 (6.9%)	3,724 (2.6%) 3901 (2.6%)

b: Opioid Pharmacotherapy Use					
	MarketScan® Private health plans		MarketScan® Medicaid (3+ states combined)		Veterans Health Administration
	2006	2007	2006	2007	2006 2007
N with an opioid dependence encounter	7,135	9,359	3,788	4,654	21,687 22,673
N (%) of individuals with opioid dependence who have at least one claim for buprenorphine during measurement year	1,952 (27.4%)	3,199 (34.2%)	203 (5.4%)	335 (7.2%)	1,210 (5.6%) 1,799 (7.9%)

Table 4

a: Alcohol Pharmacotherapy Initiation						
	<i>MarketScan</i> ® Private health plans		<i>MarketScan</i> ® Medicaid (3+ states combined)		Veterans Health Administration	
	2006	2007	2006	2007	2006	2007
N with alcohol dependence, index visit after 60 days of no SUD treatment ^a	13,589	15,698	5,564	6,377	127,670	130,516
N (%) of individuals with alcohol dependence initiating treatment, who initiate pharmacotherapy within 30 days of index visit	1,391 (10.2%)	1,528 (9.7%)	142 (2.5%)	157 (2.5%)	1,458 (1.1%)	1,500 (1.1%)
N (%) of individuals with alcohol dependence initiating treatment, who initiate pharmacotherapy within 60 days of index visit	1,578 (11.6%)	1,729 (11.0%)	207 (3.7%)	204 (3.2%)	--	--

b: Opioid Pharmacotherapy Initiation						
	<i>MarketScan</i> ® Private health plans		<i>MarketScan</i> ® Medicaid (3+ states combined)		Veterans Health Administration	
	2006	2007	2006	2007	2006	2007
N with opioid dependence, index visit after 60 days of no SUD treatment ^a	4,555	5,949	2,406	2,877	16,219	16,874
N (%) of individuals with opioid dependence initiating treatment, who initiate pharmacotherapy within 30 days of index visit	601 (13.2%)	1,101 (18.5%)	42 (1.7%)	100 (3.5%)	566 (3.5%)	812 (4.8%)
N (%) of individuals with opioid dependence initiating treatment, who initiate pharmacotherapy within 60 days of index visit	659 (14.5%)	1,130 (19.0%)	56 (2.3%)	112 (3.9%)	--	--

^a Index visit measured from March 1 through November 30 of measurement year, to allow for 30 day follow up.

^a Index visit measured from March 1 through November 30 of measurement year, to allow for 30 day follow up.