

**Applying the Chronic Care Model to Addiction Medicine in the United States**

by

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**Abstract**

This essay applies the Chronic Care Model, commonly applied to managing diabetes as a chronic disease, to substance use disorder through the lens of an inpatient addiction medicine consult team. The four components of the Chronic Care Model (increasing provider expertise, educating and supporting patients, the use of registry-based information, and the transition to team based care) serve as a framework to explore how to create a replicable model for addiction medicine treatment in inpatient settings and through integration with non-inpatient care. An academic medical center addiction medicine consult service is used to illustrate the administrative and operational applications of the Chronic Care Model, with additional illustration of the challenges present in creating and sustaining an addiction medicine service line. This is of public health importance with the growing population of United States adults with chronic substance use disorders.

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## **Preface**

### **Acknowledgements**

I'd like to acknowledge the generosity of the physicians and team who make the inpatient addiction medicine service possible: Dr. Jane Liebschutz, Dr. Deanna Wilson, Dr. Julie Childers, Dr. Tony Pizon, Dr. Kevin Kraemer, Dr. Michael Lynch, Dr. Michael Abesamis, Dr. Josh Shulman, and Dr. Joseph Yanta. Administrators Jennifer Dorazio and Zachary Lenhart made this learning experience possible and I owe them my utmost gratitude for their patience and their trust. My readers, Dr. Deanna Wilson, Professor Sam Friede, and Nichole Radulovich, offered critical insights that have shaped this text and my academic and professional experience.

### **Nomenclature**

- OUD: Opioid use disorder
- MOUD: medication for opioid use disorder
- MAUD: medication for alcohol use disorder

## 1.0 Background

Substance use disorder refers to a large group of medical disorders, with a complex diagnostic schema. The major classifications of substance use disorder are alcohol use disorder, opioid use disorder, cannabis use disorder, cocaine use disorder, polysubstance use disorder, and other drug class or chemical use disorders. Addiction can occur at varying levels of substance use and presents as a disease state characterized by compulsive and uncontrollable use despite negative consequences. Historically, substance use disorders and addiction have been treated as individual moral failings and not as chronic medical conditions requiring medical treatment, however, there is now ample evidence that substance use disorders and addiction, have strong biological bases and represent a spectrum of disease characterized by impaired brain circuitry and impaired functioning related to reward, motivation, and memory (*American Society of Addiction Medicine, 2011, n.d.*). Substance use disorders can impact a person at any point in the lifetime and there is often a relapsing and remitting course to the disease. Substance use disorder can occur with a primary substance or multiple concomitant substances, although the primary substance use disorders discussed in this paper are alcohol use disorder and opioid use disorder. These disorders are common, with 29.1% of civilian non-institutionalized adults at-risk for developing an alcohol use disorder and an estimated 5% of civilian non-institutionalized adults developing an opioid use disorder (Grant et al., 2015).

This paper will focus primarily on the treatment of alcohol use disorder and opioid use disorder as chronic diseases that require a continuum of medical services, using the Chronic Care Model as a framework. It will discuss the creation and growth of an inpatient addiction medicine

consult service in a major academic medical center as part of a continuum of medical and psychiatric treatment for substance use disorders.

## **1.1 Treatment Options**

The treatment of opioid addiction in the outpatient setting drastically changed over 100 years ago, when the Supreme Court ruled in 1919 that physicians could not prescribe narcotics to patients with a use disorder simply to prevent withdrawal – but physicians could prescribe for the purpose of weaning patient use (Priest & McCarty, 2019). Separately, Alcoholics Anonymous emerged in 1935 focusing on leveraging community-based support and ego-reduction techniques to promote sobriety and achieve abstinence from substance use (Gross, 2010). The early focus of opioid treatment was on leveraging a host of behavioral support techniques to promote abstinence, followed by the 1974 Narcotics Addict Treatment Act (NATA) which allowed the use of methadone for medical treatment and the Drug Addiction Treatment Act of 2000 (DATA) which allowed the use of buprenorphine treatment (Ducker, 2015).

While treatment options have been limited in the last 100 years, standard courses of treatment have now emerged and are more readily available in the outpatient setting. Two standard classes of medication for opioid use disorder (MOUD) exist: agonist and antagonist drug therapies. Agonist drug therapies act on the brain chemically in a similar way to the original chemical compound (in this case, an opioid); drugs in this class fulfill the cravings for opioids and allow patients to engage with treatment and participate in activities of daily life without engaging in drug-seeking behaviors. Antagonist class drugs block the action of the targeted chemical, limiting the effect when the chemical is ingested. One of the most common forms of treatment in the United

States, buprenorphine, is used to treat opioid use disorder while limiting potential misuse because it limits both the risk of respiratory depression and euphoria, even when prescribed at high doses. MOUDs are increasingly available in multiple drug and delivery types, with prescription options including oral and long-acting injections. There is growing evidence base supporting the use of these medications as the “gold standard,” however, few hospital systems routinely prescribe these medications to eligible patients during admission (Mattick, Breen, Kimber, & Davoli, 2014) (Rosenthal, Karchmer, Theisen-Toupal, Castillo, & Rowley, 2016).

Medication for alcohol use disorder is more limited, with only two drugs rated as consistently evidenced-based by the American Academy of Family Physicians; these two drugs are acamprosate and naltrexone (Winslow, Onysko, & Hebert, 2016). In any use disorder, medication alone is not a solution to recovery and all professional societies further recommend medication in addition to psychotherapy and engagement with a therapeutic environment. Wraparound supports, both in community and health modification are necessary to have lifelong recovery and abstinence.

## 2.0 Models of Care

The treatment of substance use disorder has followed a similar path to the history of the field outlined above. In the beginning stages of the field of addiction medicine, treatments for substance use disorder were episodic, with a focus on inpatient rehabilitation with little-to-no connection to ongoing outpatient maintenance (Gross, 2010). As maintenance medications have become more available and the evidence-base supporting their use grows, a more chronic care management approach has developed, though it is still developing in terms of national standardization of care. The chronic care model has been applied to other disease states, notably diabetes, and has four components for health systems and six components in clinical practice. The four characteristics that apply to health systems include increasing provider expertise, educating and supporting patients, making use of registry-based information, and making care delivery more team-based and planned (Coleman, Austin, Brach, & Wagner, 2009). This paper will focus on how each of the four components of the Chronic Care Model is addressed in the best practices of an addiction medicine service. This paper will also highlight the presence of elements that are predictive of a successful chronic care model, including self-management support, decision support, health care organization support, and connections to community resources (Coleman et al., 2009). The components and elements are described in Table 1.

**Table 1 Chronic Care Model: Components and Elements**

<b>Four Components</b>	<b>Six Elements</b>
Increase provider expertise	Self-management support
Educate and support patients	Decision support
Use registry-based information	Health care organization support
	Connection to community resources
Make care more team based	Delivery system design
	Clinical information systems

### **2.1 The Chronic Care Model Applied to Addiction Medicine: A Case Study**

Since 2000, medication therapies to treat opioid use disorder have been made more available and trained providers have been able to treat opioid use disorder in a medical setting as a chronic disease. The medical community has been working to increase provider capacity in use of these medications and other therapeutic options to treat the disease of substance use disorder, and particularly opioid use disorder (“The Evolution of Addiction Medicine as a Medical Specialty,” 2011).

In 1990, addiction medicine became a recognized specialty through the American Medical Association, with a board certification option to follow nearly 20 years later (“The Evolution of Addiction Medicine as a Medical Specialty,” 2011). The last 20 years have been a crucible for addiction medicine, both in epidemiologic need in the United States and in evidence-based practice development in treating addiction. The American Board of Addiction Medicine did not award the

first board certifications until 2009. In the last decade, capacity has been grown for the field through the creation of fully accredited addiction medicine fellowships; 10 such residencies existed in 2011, with an additional 23 programs added by 2019 (“Number of Fellowships Growing with ACGME Accreditations—American College of Academic Addiction Medicine American College of Academic Addiction Medicine,” n.d.). Through 2021, medical doctors will be allowed to substitute treatment hours and additional training in addiction medicine in a non-fellowship setting to apply for a board in addiction medicine; it is critical that existing addiction medicine programs in internal medicine and toxicology enthusiastically support their medical providers in pursuit of this board certification. The previously listed areas speak to the professionalization of the field of addiction medicine and the robust fulfillment of the first principle of the chronic care model, *the development of provider expertise*. The case study hospital discussed here is in the process of forming the first accredited addiction medicine fellowship in the region, which will be critical to the long-term sustainability of the addiction medicine services offered.

Provider expertise does not just extend to medical doctors in this model. Analogous to the role of certified diabetes nurse educators, addiction medicine has broadened the scope of specialty providers to include certified addiction medicine nurses. Starting in 2000, the Addictions Nursing Certification Board (ANCB) began certifying nurses with additional training and has certified more than 1900 nurses in the US as of December 2018, using the title Certified Addictions Registered Nurses (CARN) (“CARN and CARN-AP receives ABSNC accreditation | IntNSA,” n.d.). Critically, this certification program broadens the impact of professional training in the field of addiction medicine and additionally offers nurses in recovery an opportunity to join their unique experience with a chronic disease with their clinical bedside practice. Addiction medicine training exists for individuals in recovery without a clinical background in the form of state-level Certified

Recovery Specialist programs; these programs require more than 50 hours of classroom training in addition to 18 continuous months of recovery prior to enrollment. As of 2017, there were 896 actively licensed Certified Recovery Specialists (CRS) in Pennsylvania (the state of interest in this case study) (Department of Drug and Alcohol Programs, 2017).

These CRS positions are critical in the second tenet of the Chronic Care Model application to addiction medicine: *supporting and educating the patient*. CRSs are engaged in many national treatment models for addiction medicine because of the critical role a person in recovery can have in providing support for both initial and on-going therapeutic engagement. The only literature on establishing an addiction medicine service lists the CRS position as not only critical for patient support and education, but also engagement of community programs and support (Englander et al., 2017).

The third component of the chronic care model is the *registration of patients for on-going tracking*. In the model implemented at the case subject hospital, all patients who received an intervention from the addiction medicine consult service were tracked in two ways: concurrently by the team social worker in a HIPAA secure and team-shared non-electronic health record source and retrospectively in a health-system level reporting database that linked to post-admission outcomes information (e.g., engagement with the primary care provider of record, hospital readmission within 7 and 30 days). The concurrent tracking completed by the social worker allows the team to understand clinical and psycho-social needs in one clearly summarized area, instead of completing extensive chart review to determine discharge plans, insurance status, or previous engagement with addiction medicine outside of the hospital context. This concurrent information is also used administratively to support financial planning for the service line, philanthropic activities in support of the service, and in staffing planning based on demand for addiction

medicine services. Retrospective data is then added to this registry of patients for further analysis about impact and to address disease-specific relevant issues (e.g., proportion of population with alcohol use disorder or opioid use disorder).

The fourth element of the chronic care model is to *make care more team based and planned*. The case hospital has worked since 2017 to develop an addiction medicine service line to complement the existing addiction psychiatry and toxicology service lines that offer addiction treatment to patients. To establish the service line, a national physician leader was recruited with knowledge of how to establish a continuum of care for addiction medicine, including inpatient addiction consult services and the linkage to outpatient addiction medicine treatment. In October 2018, together with support from toxicology and psychiatry consult liaison services, an addiction medicine consult service was launched as a pilot limited to two internal medicine units. The service was staffed by an attending physician with the support of a full-time CRS and a part-time social worker. In March 2019, a CARN-certified RN was hired to support the growth of the team and the service was expanded to serve the more than 750 licensed beds in the facility. During the pilot phase, the addiction medicine inpatient consult service averaged 20 patients per month; after expanding beyond the pilot units and with the additional staffing resources, the service quickly grew to serve between 70 and 80 patients monthly.

### **3.0 Staffing an Addiction Medicine Consult Service**

Rapid growth in demand for services has resulted in clinical and administrative growing pains to provide consistent addiction medicine consult coverage. Clinically, the post-hospital placement of patients with complex psycho-social needs or patients on specific forms of medication for opioid use disorder has proven to be a consistently challenging problem because of the lack of community placement options and high administrative burden to coordinate placement. Patients with a history of intravenous drug use who require long-term intravenous antibiotic therapy for infections are often ineligible to receive care in skilled nursing facilities, often requiring a high-resource six-week hospitalization. Additionally, linking patients to a state-certified drug and alcohol provider in their county of residence can be challenging when there may be only one provider with limited capacity to engage new patients.

Administratively, the growth of the service and the general lack of evidence-based approaches to hospital-based addiction medicine services has resulted in extended justifications for financial or administrative resources. Internal benchmarking with other non-procedural services has been a successful approach to supplementing national staffing benchmarking available for toxicology and palliative care consult services. Internal interviews were conducted for benchmarking with the psychiatry consult liaison service and the palliative medicine services. In both cases, these services closely mirror the care provided by the addiction medicine service because they are non-primary services (they only offer a consultative opinion to the primary medical or surgical team) but the services link patients with outpatient continuation of treatment. Additionally, these services both involve lengthy face-to-face interviewing of the patient and supportive family members. In these conversations about benchmarking, the administrative team

for addiction medicine generated staffing standards on the following outcomes: expected number of patients to be billed per day and the ratios of medical providers to nursing staff. In Table 2, the results of this internal and external benchmarking are shown. In general, services expected their providers to bill for at least 6 face-to-face patient encounters daily, or 30 patient encounters weekly to support a full time clinical medical staff member, with an average frequency of visits being every 3 days for those clinical services that reported.

**Table 2 Staffing for an Addiction Medicine Service**

	<b>Expected patients per day per MD</b>	<b>Expected Frequency of Care</b>	<b>MD:RN Ratio</b>
Psychiatry Consult Liaison (Internal)	6	Every 3 days (~2-3 consults per hospital stay)	.08:1.0 FTE
Palliative Care (Internal)	8	Not reported	Not applicable.
Palliative Care (Henderson et al., 2019)	5	Not reported	1.0: 1.0 FTE
Toxicology (Wiegand et al., 2015)	6	2 consults per hospitalization	Not applicable

A national study in the Canadian health system supports this approach to staffing for palliative care services, citing two approaches to staffing models. The first approach suggests a NCBDE 1.0 MD full time equivalent with a 1.0 nursing full time equivalent to support 25 consults per month, when using a hospital-based consult model (as is true in the addiction medicine consult model); the second approach suggests the same ratio of providers per six palliative/hospice care level beds for a unit-driven staffing model (Henderson et al., 2019). External benchmarking of a New York State based toxicology consult service supported assumptions about the frequency of consult services and general volume estimates of monthly consults based on a large academic teaching hospital with more than 800 licensed beds. In this study, the consult service saw on

average 80 initial consults monthly with a similar volume of subsequent consult follow up visits, each taking on average one hour of physician time to complete (Wiegand et al., 2015). In the toxicology consult service, no supportive staff members were included in the efficiency or cost model and could not be reported as part of a staffing ratio.

## **4.0 Constraints in Applying the Chronic Care Model to Addiction Medicine Nationally**

Addiction medicine is a developing field, primarily growing and flourishing in high-resource academic settings. Substance use disorder is a national clinical problem, and an increasingly rural challenge. Each year, the economic burden of the substance use disorders exceeds \$400 billion (NIDA, 2017). This exceeds the estimated \$327 billion spent each year on the diagnosis, treatment, and overall reduced productivity of Type I and Type II Diabetes in the United States (American Diabetes Association, 2018). While the development of a full chronic care model within diabetes has been largely seen as successful and diabetes is used as the general use-case for the chronic care model, this same model has not been widely applied to addiction medicine diagnosis and treatment. One of the major challenges to the broad application of the chronic care model to addiction medicine is the current centrality of addiction treatment in urban and academic-based healthcare settings, unlike diabetes which is successfully managed in lower-resource primary care settings in non-urban or non-academic settings.

### **4.1 Challenges in Implementing Chronic Care Addiction Medicine**

In the current reimbursement climate and increasingly stretched hospital system margins, it can be challenging to identify opportunities to financially support a human capital-intensive service like addiction medicine. The payer mix for patients within addiction medicine is rarely favorable towards commercial insurance products with high-reimbursement, leaving shortfalls between the high cost of clinical staff and the low reimbursement for patients with complex

coordination needs. Additionally, unlike a chronic care population with diabetes, there is not yet a robust system of outpatient providers with the interest and expertise to manage patients with complex substance use disorder in a standard outpatient setting. This is due in part to regulatory issues that have persisted for 100 years since the 1919 court ruling limiting the use of medication for opioid use disorder. In modern day this manifests as the X-Waiver restriction that requires providers to complete extensive training prior to prescribing patients buprenorphine, a prescription commonly used to support patients in recovery from opioid use disorder. In order to appropriately generate a return-on-investment for an addiction medicine service, extensive data supports are required to build a financial case on other metrics. These other metrics can include hospital length of stay, reduced hospital and emergency department readmissions, and decreased mortality. The case hospital discussed in this paper is currently partnering with biostatisticians to build a model for assessing the impact of the addiction medicine consult service prior to submitting funding requests for on-going financial support. Not all hospitals will have access to biostatistical resources that are available to academic clinicians at a major academic medical center.

## 5.0 Conclusion

In order to address the national crisis in managing chronic and acute substance use disorder, healthcare resources must respond by acknowledging that substance use disorder is a chronic disease and use evidence-based structures for chronic care management. In applying the core structures of the chronic care model that has improved care for diabetic patients in the United States to substance use disorder, there are additional opportunities to grow and develop the provider teams that care for substance use disorder patients. Addiction medicine consult services should be a core part of this service growth and professionalization, as these hospital-based teams can serve as a critical touchpoint for patients and for other providers. Addiction medicine consult services can also be piloted without substantial resource commitments. It has been shown that these consult services stabilize in patient volumes within a year of starting the consult service ((Wiegand et al., 2015), (Englander et al., 2017)). While these inpatient addiction consult services improve coordination of care, they also have been shown to improve patient engagement with treatment upon discharge for opioid use disorder patients (Liebschutz et al., 2014). The creation of a standard addiction medicine consult infrastructure will serve as a national backbone in the application of a chronic care model to substance use disorder.

## 5.1 Recommendations

Effective dissemination of best practices from the hospital-based chronic care model of addiction medicine will require continued and sustained growth in the field. This growth must be multidisciplinary in nature, with clinical exposure to addiction medicine for trainees in medical schools, nursing schools, and schools of social work. In the program discussed here, trainees from schools of medicine, nursing, social work, and pharmacy rotate through the inpatient and outpatient addiction medicine services and gain valuable exposure to addiction medicine. Growing the field of addiction certified nurses from the current 1,000 will also be beneficial for the overall application of the chronic care model outside of the hospital setting. As a point of comparison, in 2016 there were 9,834 certified diabetes nurse educators in the United States (“2016 Count of CDEs by State and Other Statistics”, 2016). This specialized role for nursing fulfills three of the four core tenets of the chronic care model: increasing provider expertise, improving patient education about their disease state, and improving team-based care. In addition to growing the number of board-certified addiction medicine medical doctors, substantial effort should be made to increase the number of CARN certified nurses and nurse practitioners across the country.

## **6.0 Academic Experience**

As a student through my administrative residency with the Department of Medicine, I was able to serve as an administrative support to the development of the Addiction Medicine Consult Service at UPMC Presbyterian. This experience allowed me to practice a variety of administrative skills, including scheduling physicians, procuring resources, and managing partnerships with other medical subspecialties. As the administrative resident, I was able to manage unique pay arrangements for involved physicians, produce financial proformas to hire physicians and advanced practice providers, and evaluate on-going financial performance. This experience quickly and robustly developed my understanding of hospital finance, medical billing and coding, and physician compensation.

Working with providers in addiction medicine across the Division of General Internal Medicine and providers in Medical Toxicology in the Department of Emergency Medicine was incredibly educational in approaches to care for patients with substance use disorder. Medical providers were generous to educate me to the types of addiction medicine services that could be provided and about the importance of reducing stigma for this at-risk population. My administrative learning experience was only eclipsed by my education in the work medical providers and the multidisciplinary team provide to patients who are seeking to live a healthier life. The persistence in the patients receiving treatment and the providers giving care was perspective-changing and illustrated the best of what medical care can be.

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