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A Perspective from the Field: How Can We Empower the Next Generation of Physician to Heal the Opioid Epidemic?

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ABSTRACT

Despite the continued emphasis on prescription opioids in the media and rise in substance use seen during the COVID-19 pandemic, medical school graduates today are unprepared to turn the tide on the opioid epidemic. In this paper, we review the current state of these topics in undergraduate medical education and explore what an educationally driven, forward-thinking approach to “healing” problematic substance use in our society might entail. These initiatives are discussed with the ultimate purpose of detailing how the education of future clinicians is necessary to improve our outcomes with the epidemic. We offer four educational initiatives relating to (1) comprehensive pain management, (2) developing a natural history of SUD by uniting psychiatric and neurological perspectives (3) providing patient exposure and training opportunities (4) enhancing and standardizing care through evidence-based medicine. This perspective is contextualized with a brief discussion of the national climate and societal factors that act inseparably on the present crisis. In focusing our efforts on the next generation of physicians, we hope to reform and improve the practices of future providers and begin to elicit meaningful change.

KEYWORDS

Education; addiction; substance use disorder; opioids; medical education; opioid use disorder; pain

Introduction

The coronavirus pandemic has paved the way for other public health crises: as the world over lost jobs, security, and loved ones, a tide of suffering and despair has been rising. In the last year, rates of substance use have risen alarmingly (Centers for Disease Control and Prevention, 2020; Pollard, Tucker, & Green, 2020), with corresponding tolls on physical and mental health that have gone underappreciated but whose costs we will be paying for years. When beginning an intern year, many are left wondering: have the last four years of education adequately prepared them to handle these problems?

By the end of medical school, a future physician should acquire the knowledge necessary to provide high-quality care for a wide variety of patients. Although educators cannot expect trainees to master everything necessary to succeed as a clinician, they hope to provide them with a sufficient foundation to empower continued learning and growth. Yet, after completing medical education, medical school graduates look back at their curriculum and wonder: where were the lessons on comprehensive pain management? Where were the lectures on how to treat substance dependency for a population so clearly suffering?

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Despite the continued emphasis on prescription opioids in the media, emerging evidence supports the concept of a singular addictive processes (Burger & Stice, 2012; Gearhardt & Hebebrand, 2021; Hatterer, 1982; Jacobs, 1986; Kim et al., 2011; Kühn et al., 2011; Limbrick-Oldfield et al., 2017; Maté, 2008; National Research Council Committee on the Social and Economic Impact of Pathological Gambling, 1999; O'Connor, 2021; Piazza & Deroche-Gamot, 2013; Schulte, Avena, Gearhardt, & Weir, 2015; Schulte, Smeal, Lewis, & Gearhardt, 2018) . While its focus may vary, the pathology characterizing the neurobiological and psychic changes of addiction is apparent in everything from chronic cigarette use and alcoholism to problematic gambling and compulsive shopping. From broad to specific: the word “addiction” refers to this general process, while the term “substance use disorder” (SUD) represents the clinical manifestation of a substance addiction and “opioid use disorder” (OUD) being one such example.

As a recent medical school graduate and a faculty educator who has spent decades working to improve teaching and education, in this paper, we explore the opioid epidemic as an example of what an educationally-driven, forward-thinking approach to healing problematic substance use might entail – yet the philosophy and approaches detailed below could be adapted to other behavioral and substance addictions. We review the current state of four topics in pain and SUD/ OUD education and conclude each section by identifying educational initiatives that we hope may pave the way for improved clinical management of these topics in the future. Although these initiatives will be discussed explicitly in the context of undergraduate medical education, they are offered in the hope that this philosophy may be adapted for training among all healthcare disciplines. Our ultimate purpose is to detail how the education of future clinicians is essential to changing the environment that enables the problem to persist.

(1) Development of comprehensive pain management curricula.

Pain is one of patients’ most common presenting complaints (Watkins, Wollan, Melton, & Yawn, 2008). Current estimates (Yong, Mullins, & Bhattacharyya, 2021) of the prevalence of chronic pain in the United States suggest that roughly 1 in 5 adults experience pain most days or every day, resulting in increased workdays missed, reduced participation in social activities, and greater difficulty performing activities of daily living all of which may contribute to isolation which itself is related to substance use (Ingram et al., 2020). Further, chronic pain has direct impact on a patient’s mental health status, including disturbed sleep (Sinatra, 2010), increased prevalence of psychiatric co-morbidity in later life (Blay, Andreoli, Dewey, & Gastal, 2007), risk of suicide (U.S. Department of Health and Human Services, 2019), and substance use (Ditre, Zale, & LaRowe, 2019). Given the burden of pain in the population, it is essential that medical students learn to manage this condition to decrease suffering and the flow of unnecessary opioids into society – yet we offer no standardized pain curriculum.

Given the physician’s primary concern of alleviating suffering, inevitably, they will treat pain. Yet when America’s First National Pain Medicine Summit convened in November 2009 (Lippe et al., 2010), they evaluated pain management training as poor or “not leading to competency” at both the undergraduate and residency levels. In one study (Fishman et al., 2018) that reviewed pain and analgesic-related content on the United States Medical Licensing Exams, investigators concluded that while pain was reflected on a reasonable

proportion of the exam, questions were too heavily focused on how pain is recognized; the test did not sufficiently reinforce the importance of understanding pain as a biopsychosocial process or the principles of pain management, including the use of non-pharmaceutical interventions (Bosy, Etlin, Corey, & Lee, 2010; Brecht, Stephens, & Gatchel, 2020). In a 2001 survey (Blumenthal, Gokhale, Campbell, & Weissman, 2001) of US medical residents, approximately 50% of participants reported feeling only “somewhat prepared” to counsel patients about pain management and approximately 25% felt “somewhat unprepared” or “very unprepared.” In other words, approximately 75% of the study participants did not feel adequately prepared to address pain. Such findings are similar among nursing faculty (Voshall, Dunn, & Shelestak, 2013). Not much has changed regarding this comfort level today (Chen, 2016; Doorenbos et al., 2013).

When we conceptualize pain, we typically use a biomedical model that emphasizes peripheral nociception and often focuses on underlying disease mechanisms. Training curricula that teach about pain frequently do so through sparse number (Doorenbos et al., 2013; Scudds, Scudds, & Simmonds, 2001) of lecture hours, often in a course otherwise focused on the nervous system or pharmacology. While the biomedical model may be efficacious for treating acute pain, when applied to chronic pain, its reductionistic approach may often rely on continuing escalations of pharmacotherapy that are potentially unable to meaningfully impact the underlying processes. With our current approach, clinicians are often underutilizing non-pharmacologic pain management techniques (Kirsh & Fishman, 2011) to treat chronic pain. We need to focus educational efforts toward (Barrevelde & Griswold, 2018; Doorenbos et al., 2013; Kroenke et al., 2019) a biopsychosocial model of treating chronic pain that emphasizes the importance of central mechanisms (Borsook & MacDonald, 2010; Goubert, Vervoort, Sullivan, Verhoeven, & Crombez, 2008; Palermo, Valrie, & Karlson, 2014) (e.g., cognitive and emotional responses), multidimensional therapeutics (Giummarra, Gibson, Allen, Pichler, & Arnold, 2015; Khan, Walsh, & Brito-Dellan, 2011) and the role of the individual in self-managing.

Efforts (Doorenbos et al., 2013; Fishman et al., 2013) have been made to establish standardized core competencies in pain management. The NIH Pain Consortium’s Centers of Excellence in Pain Education has worked to create pain education modules (National Institute of Health Pain Consortium, 2021). Some states, such as Pennsylvania (Ashburn & Levine, 2017) and Massachusetts (Antman et al., 2016), have already begun to spearhead educational initiatives in their medical schools. Areas of focus for a standardized approach to pain pathophysiology and management training has been described by Zacharoff and colleagues (Chiauzzi, Trudeau, Zacharoff, & Bond, 2011). These efforts must:

- (1) Establish an evidence-based approach to the evaluation and diagnosis of pain (e.g., focused history and physical, screening (Huffman et al., 2015) for personal/ family history of substance use to stratify patients based on risk, directed testing supporting diagnosis, establishment of common goals of management, formulation of an individualized (Holmquist, 2009; Smith, 2009) treatment plan, including opioid rotation (Fine & Portenoy, 2009) and opioid-exit/ deprescribing strategies
- (2) Enhance and standardize our analgesic prescription and documentation practices (e.g., incorporation of regular aberrant-use risk assessment and re-assessment of the risks, benefits, and indications for ongoing opioid therapy, administration of opioid treatment agreements, and informed consent that reviews (Cheatle & Savage, 2012)

common adverse effects, including the risk of addiction, physical and psychological dependence, tolerance, opioid-induced hyperalgesia, and the potential for patient victimization by others)

- (3) Re-frame our discussion so that opioid analgesic therapy is seen as a *component* (Giummarra et al., 2015; Khan et al., 2011; Kirsh & Fishman, 2011) of a comprehensive multimodal pain treatment plan alongside non-pharmaceutical measures (Bosy et al., 2010; Brecht et al., 2020; Heapy, Stroud, Higgins, & Sellinger, 2006) (e.g., physical therapy, meditation), not the sole treatment

Using opioids safely also depends on understanding who is at risk for adverse events. When we use the term “risk,” we are referring to the elements in an individual’s personal and familial histories that are statistically predictive (Substance Abuse and Mental Health Services Administration, 2016) of problematic prescription use and substance dependency. Students should be taught to evaluate risk using validated assessment tools (Black, McCaffrey, Villapiano, Jamison, & Butler, 2018; Cheatle, Compton, Dhingra, Wasser, & O’Brien, 2019; McCaffrey, Black, Villapiano, Jamison, & Butler, 2019), and that in classifying patients as low, moderate, or high risk, the clinical implication is the level of risk should determine the degree of risk mitigation strategies employed by the provider – *not* whether opioids are indicated for a patient. For instance, whereas a “low-risk” patient (e.g., no personal or family history of SUD) might be managed in a primary care setting with basic precautions, a “high-risk” patient (e.g., with a personal history of SUD) may be more appropriately (Gourlay, Heit, & Almahrezi, 2005) managed by a physician with expertise in SUDs and benefit from mitigation strategies such as pill counts and random urine (Mahajan, 2017) toxicology screening that assess adherence or diversion.

One more limitation of our prescription practices is a general failure to consider how the prescription of opioids may impact a patient’s household, local community, or society in general. Many (Gregorian et al., 2020) patients save unused opioid prescriptions for future need if someone else develops pain. A study (Khan, Bateman, Landon, & Gagne, 2019) found that the odds of an overdose for individuals of all ages – who themselves did not have an opioid prescription – increased almost threefold when family members were being prescribed opioids. The question the provider must ask becomes, “what is the likelihood this drug may be introduced into a household or community where a substance user who may be likely to go on to potentially use other opioids may gain access to it?”

If we send patients home with fewer opioids, it may mean the patients have to call for refills more often – a mutual inconvenience that may facilitate monitoring and dosage changes and ensure that the patient’s requirements are decreasing over time. The goal is not to limit the flow of all opioids into the community, but rather to establish additional layers of consideration in the risk-benefit analysis to broaden our conception of potential impact. The patient-provider relationship must be such that the patient trusts that if future analgesics are needed, the provider will address those needs.

- (2) Formation of a natural history of SUD united by current developmental, psychiatric, and neurological perspectives.

Significant care is taken in medical education curricula in understanding the pathophysiology and natural history of conditions such as diabetes mellitus and congestive heart failure. There is scarcely the same consideration given to substance use: according to Dr. Kevin Kunz (Hoffman, 2018), executive vice president of the Addiction Medicine Foundation, while most medical schools now offer some education about opioids, only about 15 of 180 American programs teach addiction education that relates to alcohol, tobacco, and other drugs. Further, he notes that among these schools, the content varies widely, spanning from one pharmacology lecture to several weeks of clerkship year exposure in psychiatry or primary care specialties. These observations reflect how rare comprehensive addiction training is among American medical educational systems. Educational reform is necessary for increasing our compassion for and early recognition of these patients.

The perception of addiction as a disease has recently gained traction though misconceptions endure. A commonplace one construes addiction as the natural progression of substance use, where an individual's desire to experience a particular drug effect gradually becomes their primary motivating force, corrupting the protective influences of responsibilities, social relations, and personal interests. Research (Alexander, Coombs, & Hadaway, 1978; Alexander, Beyerstein, Hadaway, & Coombs, 1981; Fleming, Balousek, Klessig, Mundt, & Brown, 2007; Garland, Froeliger, Zeidan, Partin, & Howard, 2013; Robins et al., 1974; Robins et al, 1974) does not support this view – yet our framework persists, contributing to our beliefs: that continued substance use inevitably leads to addiction; that recovery and abstinence are simply a matter of willpower; that any relapse event is a moral failure.

Addiction is a brain disease – yet in relegating the study of SUD to psychiatry, we have ignored the neurology that defines true chemical dependency. Our understanding of addiction is rooted to our DSM-5 definition, based on clusters of behaviors that we can identify but which do not address the neurobiological basis of their development. How is the brain of an addicted individual different and what enables these differences to occur? While much time and research have gone into understanding the answer to these questions, these efforts have not been commensurate in our curricula.

Conceptualizing addiction as a disease process should begin with establishing a developmental framework for learning, reward, motivation, and attachment. From a neurodevelopmental perspective, adolescence is characterized by rapid changes in brain development, early maturation of the circuits underlying executive functions, impulse inhibition, and emotional self-regulation. While addiction can happen at any point across the lifespan, the adolescent's immature prefrontal cortex is unable to exert the same degree of inhibition over their behavior; developing brains repeatedly exposed to the powerful psychoactive drugs are thus particularly susceptible to their influence. If deprived of the protective and nurturing influences necessary for normal development and emotional regulation (e.g., in a traumatic household or neighborhood environment), the susceptible individual may instead learn to rely (Alexander et al., 1981; Maté, 2008) on substances to deal with unpleasant internal states.

Exposure to repeated stressors then reinforces substance-coping and the development of the behavioral habit. During this critical stage, the individual comes to believe that the substance enhances their lives by satisfying a basic need. Dr. Gabor Maté (2008) explains, “substance users cannot envision a life without their drug of choice. Since their addictions

offer biochemical substitutes for love, connection, vitality, and joy, to ask them to desist from their habits is to demand that they give up on the emotional experiences that make life worth living for them.” Research (Dube et al., 2003, 2006) on adverse childhood experiences (ACEs) strongly support this idea, with youth exposure to more trauma exhibiting a “dose-response” correlation with future substance use. Characterized by deviation from normal development (Alvarez-Monjaras, Mayes, Potenza, & Rutherford, 2019) catalyzed by environmental disruptions, an addiction is a learning disorder (Maté, 2008; Szalavitz, 2017).

Understanding that SUDs are learned or developed over time, if we can learn to appreciate the environment (Lee et al., 2019) in which SUD arises, then we may be better positioned to prevent them in the first place, just as we work to prevent the long-term complications of untreated hypertension by intervening when an individual’s blood pressure begins to rise. Our efforts to address the prevalence of SUD in our society depends (Center for Substance Abuse Treatment, 1997; McKnight-Eily et al., 2014) on improving our screening practices for problematic substance use in primary care settings. Substance use among adolescents is associated (Steele et al., 2020) with the leading causes of death in this age group, including trauma or injury, overdose, suicide, and violence – yet here again research (Levy & Williams, 2016; Quest Diagnostics Health Trends, 2019) suggests our screening performance is poor and our recommendations unclear (Krist et al., 2020). Considering that teenage polysubstance use is predictive (Galaif & Newcomb, 1999) of polysubstance use in adulthood, there is potential benefit to identifying risky experimentation earlier.

While all patients should be screened for substance use as part of routine healthcare visits, the Substance Abuse and Mental Health Services Administration (SAMHSA) offers an approach for taking this practice further in its Screening, Brief Intervention, and Referral to Treatment (SBIRT) model. SBIRT can be rapidly employed to categorize patients along the spectrum of substance use into risk levels with associated management recommendations (Substance Abuse and Mental Health Services Administration, 2021a) pertaining to the individual. Practitioners should be trained to employ the model during regular appointments (Substance Abuse and Mental Health Services Administration, 2021b), to effectively handle sensitive discussions associated with substance use, and how to utilize any information elicited in a time-efficient manner. The importance of continuing to nurture the patient-provider relationship after a referral remains critical to ensuring follow-through and supporting the patient’s long-term health.

Humans instinctively fear and reject what they do not understand. How can we expect our trainees to do better than we have when they are learning about substance dependency “on the job?” Students must appreciate the critical fact that the addicted individual *learns* to use a drug to satisfy an (often environmentally triggered) undesirable internal or basic unmet need and that this learning process must be reinforced by conditions of vulnerability (environmental \gg genetic). Only by incorporating addiction pathophysiology and patient exposures during undergraduate medical education can we prepare our trainees to deal with it effectively and compassionately.

- (3) Provision of training exposure and clinical opportunities with patients suffering from chronic pain and OUD.

Chen (2016) articulated the impact of bias while managing opioid-dependent patients in the hospital. He described how when analgesic-dependent patients were admitted, providers – consciously and unconsciously – grappled with their competing interests of prioritizing adequate pain treatment and recognizing the dangers associated with the misuse of opioid drugs. This struggle was compounded by the role modeling of supervising doctors who were trained in an era that did not emphasize the importance of pain management, and sometimes espoused dismissive attitudes, such as, “If we just stop ordering the opioids, these patients will eventually find their way out of the hospital.”

Chen (2016) argued that these attitudes primarily develop from provider discomfort in prescribing opioids and managing these patients in the inpatient setting, which almost invariably arises from limitations in provider training. Editorial papers such (Provenzano, 2018) as these reflect a growing awareness that the implicit and explicit attitudes we hold toward patients on chronic analgesic therapy can have profound implications on not only these patients’ healthcare experiences, but also our ability to appropriately address their needs. Narratives (Esquibel & Borkan, 2014) by physicians and their patients with chronic non-cancer pain receiving long-term opioid analgesic therapy likewise reflect a strained and complicated relationship.

Patients who are receiving or have previously received long-term opioid analgesic therapy for nonmalignant pain likewise face stigma from family, friends, coworkers, insurers, and society. This stigma can result in feelings of guilt, shame, judgment, and embarrassment, increasing the risk of mental health issues (anxiety, depression), additional barriers to treatment, and hindering implementation of programs and policies (e.g., Medications for Opioid Use Disorder or MOUD, naloxone, safe injection sites). Hostile attitudes, only further complicated by the co-morbidity with mental illness (Hartwell, Tolliver, & Brady, 2009; Jané-Llopis & Matytsina, 2006; Roberts, Roberts, & Xing, 2007; Vreugdenhil, Van Den Brink, Wouters, & Doreleijers, 2003), translate (Glod, 2017) to reduced time with patients and less regard for their well-being. Although treatment enhances the likelihood of recovery, only 24.1% (Hasin, Stinson, Ogburn, & Grant, 2007) of people with lifetime alcohol dependence will ever seek treatment, an uncomfortable statistic that, at least in part, derives from negative experiences among individuals struggling with SUDs during clinical encounters. For these reasons, our approach should be to make ourselves aware of our tendency toward prejudice and seek to incorporate (implicit) bias training into medical education.

Data suggests that the more experience a provider has (van Boekel, Brouwers, van Weeghel, & Garretsen, 2013) with this patient population, the less likely they are to perceive them as having significant control over their disease or exhibit attitudes of intolerance or negativity. Patients, in turn, are more likely to adhere to a treatment course when they perceive positive or accepting attitudes in their healthcare staff. These findings strongly imply that addiction education can positively impact both provider attitudes and treatment outcomes. As trainees (and their future patients) are likely to benefit from exposure to guest speakers in recovery, visits to treatment facilities and recovery groups, every effort should be made to incorporate these exposures into curricula.

A model for standardized patient encounters has been pioneered by Dr. Lidya Wlasiuk (Hoffman, 2018) at the Boston University School of Medicine. As an instructor of addiction awareness, Dr. Wlasiuk has demonstrated how we can incorporate addiction medicine training into all four years of medical school. She argues that this approach is essential:

“Because addiction medicine is young, most medical schools can’t rely for expertise on fellows . . . Fellows would typically consult on addiction-related cases in hospitals and clinics, educate medical students and supervise residents in primary care fields where these patients first appear: family medicine, emergency medicine, obstetrics.” Instead, her program seeks to empower trainees, understanding they will be responsible for these patients in the future and will further shape the attitudes and practices of future clinicians.

Among the most laudable of her initiatives is a series of standardized objective clinical encounters that expose trainees to difficult patient-provider interactions regarding substance use. For example, trainees confront situations where an actor is demonstrating aberrant analgesic usage or that relate to long-term pain management among patients at risk for developing a SUD. By participating in group sessions with standardized patients and feedback, trainees develop the skills necessary for the nuances of assessing pain, conducting motivational interviewing, or speaking (Kelly, Dow, & Westerhoff, 2010) to patients about unexpected urine drug toxicology results. Following these controlled exposures, trainees are then given the opportunity to practice these skills with actual patients days later. This approach helps students not only practice identify risky substance use behavior, but also helps them learn how to speak to patients in a compassionate, sensitive manner – as opposed to expecting trainees to develop these same skills when they encounter these situations clinically.

(4) Enhance and standardize our evidence-based clinical care practices.

The blueprint for contemporary management of patients with OUD is better elucidated than it is for other substance dependencies: allow for withdrawal and medical stabilization; attempt to regulate patient craving and drug-seeking behavior with medications; offer therapy and/ or community treatment resources that address the patient’s psychosocial needs; when in doubt, refer to an expert. While this formula can be highly effective in some cases, it is woefully underutilized and yet incomplete.

There is now a sizable body of literature supporting the use of patient-centered, multi-modal (Giummarra et al., 2015; Kirsh & Fishman, 2011) treatment models and standardized usage of MOUD, but these approaches have been hampered by their limited reach among healthcare workers. At present (National Academies of Sciences, Engineering, and Medicine, 2019), we have strong evidence for three efficacious medications in treatment of OUD: naltrexone, buprenorphine, and methadone. These medications are approved by the FDA for the purposes of alleviating withdrawal symptoms, reducing opioid cravings, and diminish the effect of future substance use, and have been found (Leshner & Dzau, 2019) to improve retention, reduce drug use, and limit adverse events more effectively (Schuckit, 2016; Wakeman et al., 2020) than other forms of treatment. The USPSTF reported unequivocally in 2020 (Krist et al., 2020) that pharmacotherapy is the “standard for treatment of [OUD]” and “Withholding or failing to have available all classes of FDA-approved medication for the treatment of opioid use disorder in any care or criminal justice setting is denying appropriate medical treatment.”

Unfortunately, accordingly to 2019 estimates (National Academies of Sciences, Engineering, and Medicine, 2019), less than 35% of adults with OUD received treatment for opioid use in the past year. In another study, only 12.5% (Schuckit, 2016) of the cohort examined had initiated treatment with buprenorphine or methadone, and more frequently

engaged with psychosocial treatment and/or inpatient detoxification – both of which are less effective than either medication. Barriers include (Wakeman et al., 2020): a lack of waived practitioners (Provenzano, 2018); high co-payments; prior authorization requirements; restrictions on use (e.g., methadone is only available at designated federally regulated opioid treatment sites; buprenorphine requires DATA 2000 waiver + DEA X-number for office-based treatment). One study (Leshner & Dzau, 2019) found that only 6% of addiction treatment centers offered all three medications for OUD.

The reach of our guidelines and evidence-based treatments is further hindered (Gatchel, McGeary, McGeary, & Lippe, 2014) by insufficient reimbursement from third-party payers. Part of the issue is that the current reimbursement model leads (Gatchel et al., 2014) doctors to have a particular type of interaction: what is the patient's symptom, and what pill treats it? A doctor may have no more than ten minutes with a patient, and may not feel that pain falls high on the patient's problem list; checking the Prescription Drug Monitoring Program (PDMP) is time consuming and not a billable activity; the provider attempts to prioritize patient safety by internalizing the belief that "we should limit what we prescribe," forcing the patient to return for another appointment (and another co-pay). We recognize the comorbidity of SUD and mental health disorders, yet the treatment of SUDs is often "siloeed" (Croft & Parish, 2013; Sterling, Weisner, Hinman, & Parthasarathy, 2010) from the general healthcare, and our system remains poorly equipped (Kelly & Daley, 2013) to address the range of problems among such "dual-diagnosis" patients. A better approach would be to incorporate third-party payers and the pharmaceutical industry in our policy discussions to facilitate reimbursement for comprehensive approaches.

Critically, care must be taken to teach trainees to learn to work with patients "where they are now" rather than prescribing "one size fits all" management plans. A major shortcoming of our current management approach is that we are not designing treatment goals based on where the patient is currently and their motivation to change. The data tells a clear story: harm reduction (Bartlett, Brown, Shattell, Wright, & Lewallen, 2013; Jiloha, 2017; Maté, 2008; Single, 1996) must be the general principle guiding our treatment of patients who are not yet motivated to cultivate abstinence and more generally, should guide our attitude toward substance use in society. While this approach may be difficult to palate for those who broadly champion limiting the use of all drugs, research strongly supports the idea that this philosophy is more effective (Canadian Paediatric Society, 2008; Kelly & Wakeman, 2019; Logan & Marlatt, 2010) in limiting the adverse effects associated with their use, such as: preventing the spread of infectious disease, limiting deaths and consequences of overdoses, and preventing the development of SUD/ OUD. To mitigate harm, research suggests that we consider safe needle/syringe exchange programs, supervised consumption sites, lower-thresholds for pharmacotherapy/ MOUD, prescription of methadone (or controlled heroin) for addiction, and legalization of less-harmful drugs.

While we have a good deal of evidence to support these interventions, if we cannot offer them to our patients based on system- or resource-based limitations, then we are depriving our patients of effective care. Perhaps more than any of the previous educational initiatives mentioned in this paper, this task will require sustained effort and commitment, as well as advocacy from patients, communities, healthcare professionals, and policymakers – but we must strive to modify the national context that is enabling this problem to thrive.

Discussion

As Dr. Norman Zinberg compellingly argued in his ground-breaking work on controlled substance use, *Drugs, Set, and Setting* (Zinberg, 1984), we cannot appreciate an addiction without first appreciating the context in which it arises. Public policies both define and constrain normal societal behaviors by distinguishing what is acceptable and what is not. Laws that criminalize drug use and label all users as deviant inevitably shape our attitudes, alienating illicit drug users from mainstream society. As the severity of the SUD grows, so may the associated spectrum of delinquent behavior and potential for criminal activity, fostering a perception of these “others” as “problems” to be dealt with penally. At this point, the physical, social, and psychological consequences of their continued usage are numerous and difficult to address. Once isolated from mainstream society, branded “drug abusers,” “junkies,” or “addicts,” suffering individuals are left to fend for themselves.

A consequence of our tendency to view addiction itself as “the problem” is that it leads us to focus on abstinence as the only desired outcome and neglect the context that enables the addiction to arise in the first place. There is perhaps no greater policy failure in reflecting biopsychosocial and developmental conceptions of addiction than that of the American criminal justice system, whose policies (Musto, 1999) are steeped in a history of racial injustice (Miller, 2010) that has inequitably afflicted minorities. While prison can separate an individual from their substance, triggering withdrawal and initiating physiological normalization, it leaves unaddressed the sociocultural and environmental factors (Lee et al., 2019; Maruna & LeBel, 2003; Morenoff & Harding, 2014) to which the individual is returning and through which they must be understood. Addicted individuals still believe that the substance is serving a purpose in their life; if they are to remain sober after jail, they must learn to navigate the stresses of life without the substance.

As the persistence of America’s “drug problem” despite our status as the world’s leading incarcerator suggests, our harshest laws will not curtail the progression or prevalence of SUD. The endurance of SUD in the face of spiraling personal consequences defines the pathology of addiction. Even if an individual has truly been able to benefit (“reform”), the same punitive system will forever complicate their ability to reintegrate themselves, find sustainable occupation, or be seen as “normal members” of society. The imprisoned retains all the same habits, relationships, and vulnerabilities as they had before their imprisonment. How can an approach based in punishment do anything other than enable (Johnson, Pagano, Lee, & Post, 2018; Wooditch, Tang, & Taxman, 2014) further usage?

A common theme element in the stories of recovery communities is “bottoming out” moments, which are often seen as an inherent necessity toward recovery. However, in a societal context, the idea that punitive measures will facilitate the bottoming out experience and somehow end the addiction is misguided and harmful. While “rock bottom” moments may be useful in enabling the individual to confront the reality of their substance usage, they are also inherently the most vulnerable moments of their lives. If it is the first time the individual is suffering true consequence, then the feelings of shame, social rejection, and familial disappointment will only exacerbate the perception that all is lost; at this point, the prospect of feeling good again may seem entirely elusive but through the pursuit and obtainment of the substance once more. Instead, we must learn to work with (Leitch, 2017) the individual where they are *now*, and delicately guide them toward behaviors that reduce their risk of harm.

The balloon effect and educational reform

In 2011, Purdue reformulated OxyContin® to an “abuse-deterrent” formulation. The intent seemed good: by making their product tamper-resistant, they could minimize the chance that the substance would be crushed and snorted or melted and injected. The effects (Evans, Lieber, & Power, 2019), however, were not commensurate: dependent users, now cut off from their supply, were driven to use semi-synthetic opioids. Subsequently (Centers for Disease Control and Prevention, 2019; Coplan, Kale, Sandstrom, Landau, & Chilcoat, 2013), overall prescription opioid-related deaths decreased; fatal overdoses of opioids combined with other drugs also decreased; however, there was a significant increase in deaths caused by illicitly manufactured heroin and other synthetic opioids, such as fentanyl, and in polysubstance overdose fatalities not involving opioid use. Considering the dangers of illicit polypharmacy and synthetic opioids, it may be argued that the ultimate result was undesirable.

“Balloon effect” refers to unintended consequences of an attempt to intervene in a complex situation. As squeezing a balloon at one point creates pressure that causes the rest of the balloon to expand, making an abuse-deterrent formulation (good idea) led to an increase in co-ingestion overdoses and synthetic opioid deaths (bad effect). Yet how might standardizing our screening of substance use and risk affect clinical experiences of patients labeled “high-risk?” How does criminalizing the use of less harmful substances such as marijuana influence what drugs they use? We should not expect a simple solution for this problem; the way forward requires vision, actionable steps, and, most importantly of all, patience – for these practices and philosophies must be internalized gradually by both healthcare providers *and* society over time.

Our entrenched conceptions of addiction and poorly coordinated practices have done little to improve our treatment outcomes for patients with chronic pain or OUD. While there will never be a single-policy solution to these problems, a better approach depends on focusing on our medical students and residents: through educational reform and exposure to our evidence-based practices, by the time they are practicing independently, they may work to shape not only the perceptions and practices of their senior colleagues but also the national dialogue. It may take close to a decade before they are first exposure as students to when they are full-licensed providers; yet by thinking upstream, we will be better positioned to hone and integrate our practices so that by the time these new trainees are reaching maturity, they will be fortified with the experience and perspectives to analyze our patient outcomes, advocate for policy reform, and better address this crisis.

We should remain mindful of the resources and opportunities afforded to us when considering educational reform. Consider the many practical challenges about training practicing physicians: even the best-intending clinician taking advantage of a Continuing Medical Education (CME) curriculum is enrolled after-hours, on their own free time, forfeiting the precious minutes they might otherwise have for family or leisure. The liminal period that provides the foundation of our professional identity, perceptions, and practices starts ending as soon as it begins. To address the epidemic, we cannot depend upon our current providers – stretched thin in a system that leaves little opportunity for easy changes – instead, we must begin with our trainees (Mezei & Murinson, 2011; Miller, Sheppard, Colenda, & Magen, 2001; Phillips, Ford, & Bonnie, 2017; Sloan, Montgomery, & Musick, 1998; Weinstein et al., 2000;).

Healing the opioid epidemic requires a coordinated effort of patients, the public, and policymakers, as well as clinicians. As educators, we must reform our training initiatives and educate the public on the nature of addiction and the risks of substance use while engaging the community in dialogue. Recognizing that early life experiences affect future health outcomes, prevention and treatment programs targeted at at-risk children and their families need to become a top priority. As a society, we must relax sentencing for drug offenses, *especially* for adolescents, to limit the number of patients suffering from SUDs whose recovery pathway are hindered by our penal code. Perhaps most importantly, we must do all these things simultaneously – because a problem this complicated cannot be addressed at any one point alone.

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