

# Adderall Laced with Fentanyl: The Epidemic is Killing Our Youth

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## Abstract

Opioid misuse became increasingly disastrous for years before it was declared an epidemic in 2017. As prevalent as this public health issue is, this epidemic is still viewed through a stigmatized lens, with some believing that this crisis will never personally affect them. However, as the epidemic has expanded, there are new avenues for the peddling of opioids. This paper seeks to analyze this phenomenon, through the study of Adderall laced with Fentanyl, a new source of synthetic opioids that are a danger to Americans, especially young adults. This paper will assess the Medical, Legal, and Ethical perspectives of this phenomenon and then provide a series of political and social recommendations.

## INTRODUCTION

Individuals with attention deficit hyperactivity disorder (ADHD) often face barriers during their education due to difficulties with concentration and with impulsive behaviors. Studies have shown that Adderall is effective at enabling those with ADHD to focus by increasing attention spans and decreasing impulsive behaviors.<sup>1,2</sup> Although Adderall is crucial for those with ADHD, not all individuals who take Adderall need it. There are high rates of ADHD misdiagnosis, much of which have been attributed to increased public awareness of ADHD, and provider laxity in prescribing.<sup>4</sup> Studies have shown that some college students have “faked” symptoms of ADHD to obtain an Adderall prescription. Some students obtain a prescription with the intention to consume the drug themselves; others seek to sell the drug to others for profit.<sup>3</sup> There is also a significant portion of young adults who take the drug simply for the peripheral effects of euphoria and appetite suppression.<sup>3,4</sup> Whether diagnosed with ADHD or not, it has been estimated that one out of every six college students currently use Adderall or similar stimulant pills.<sup>5</sup>

Before analyzing the issues surrounding Adderall use, it is vital to confute the apocryphal beliefs pertaining to Adderall.

Firstly, many college students believe Adderall to be a performance enhancing drug, increasing rates of information encoding, processing, and retrieval, but this is not necessarily accurate. There is significant research that demonstrates that these drugs have no impact on neurocognitive performance in young healthy individuals.<sup>4</sup> Conversely, some studies indicate that stimulant drugs like Adderall have the potential to negatively impact academic performance.<sup>4</sup> Regardless of Adderall’s impact on academic performance, it possesses negative side effects. Some students have expressed changes to their demeanor including increased fidgeting, anxiety, changes to personality, and weight loss due to appetite suppression.<sup>2</sup> Much of the attitudes surrounding Adderall on college campuses revolves around its “beneficial” effects on academic performance, however much of these effects have been dispelled by the literature as myth. If these myths prevail in the general discourse, they have the power to overshadow the risks of taking this drug.

Although college students who distribute Adderall to classmates contribute to the expansion of its misuse, there are several other practices that have an even larger effect. More recently, counterfeit pills which are sold on the street

are expanding misuse of stimulant drugs like Adderall. An even more concerning matter is that these counterfeit pills are unregulated, and at times are laced with other fatal chemicals, like Fentanyl. According to a study done by the DEA, it is estimated that of all the fentanyl-laced fake prescription pills analyzed in 2022, six out of ten contain a potentially lethal dose of fentanyl.<sup>6</sup> This is an increase since last year where it was four out of every ten pills.<sup>6</sup> This increase in counterfeit pills is seen by the 75,000 deaths by overdose on synthetic opioids like fentanyl in 2022 compared to the 71,000 in 2021.<sup>7</sup>

Through this paper, we will analyze the issues surrounding Adderall laced with Fentanyl, specifically the case from Ohio State University, from Medical, Legal, Financial and Ethical perspectives. We will then propose an education platform that consists of multiple different resources and initiatives that may potentially decrease fentanyl deaths in general. The overall goal of this paper is to give a full review of both Adderall and Fentanyl, and the dangers posed to those who misuse these drugs.

### **CASE STUDY**

On Wednesday, May 4, 2022 at 10:46 p.m., law enforcement officials received a 9-1-1 call from a woman at an apartment just off-campus of Ohio State University reporting that her roommate and her roommate's friends had overdosed.<sup>8</sup> It was later reported that two of the three students died due to drug overdose, while the third was hospitalized but later safely discharged.<sup>1</sup> In response to this tragedy, Columbus Public Health urgently issued a statement on the morning of Thursday, May 5, highlighting the dangers of counterfeit Adderall pills containing lethal doses of fentanyl, which can be as little as the size of a few grains of salt.<sup>9</sup>

This story made national headlines as a symbol for the growing impact that the opioid epidemic is having on different areas of the population. According to a recent, national survey by Ohio State University called the "College Prescription Drug Study," nearly one in six college students claim to have used stimulants such as Adderall, a majority for the purpose of studying.<sup>10</sup> Unfortunately, supply of potentially deadly counterfeit drugs is also on the rise. A recent seizure of over 74,000 counterfeit pills in Massachusetts emphasized the need for increased surveillance and awareness of the dangers of these drug sales.<sup>11</sup> Among the pills seized were Adderall pills containing methamphetamine and fentanyl.<sup>11</sup> While this particular group of pills was successfully seized and the

appropriate individuals were charged, it is only a small subset of the potentially deadly pills that could enter the market. The seizure in Massachusetts served as a warning of the dangers of the illicit drug supply in this country coupled with the prevalence of stimulant drug misuse on college campuses. The increasing supply of counterfeit pills has increased the public health concern of mortality in college-aged adults.

### **MEDICAL ANALYSIS:**

#### **A. Adderall**

Mixed-amphetamine salts (MAS), a combination of amphetamine and dextroamphetamine, also known by its trade name of Adderall, is a commonly prescribed medication used for the treatment of attention deficit hyperactivity disorder (ADHD). Amphetamine and dextroamphetamine are both central nervous system stimulants that work by increasing the amounts of dopamine, norepinephrine, and to an extent, serotonin in the synaptic cleft of neurons.<sup>12</sup> This is done in two distinct ways; first through the inhibition of vesicular monoamine transporter 2 (VMAT2) which directly elicits the release of dopamine and norepinephrine, and secondly, through the inhibition of the monoamine oxidase (MAO) enzyme, which prevents degradation of dopamine and norepinephrine. The increased levels of the monoamine neurotransmitters in the cell synapse lead to the reduction of the hallmark symptoms of inattention, impulsivity, and hyperactivity that are seen in ADHD. Adderall is manufactured as an oral preparation and is available in both an immediate-release (IR), lasting between 5-8 hours, and an extended-release (XR), which lasts between 10-12 hours.<sup>13</sup>

The most common side effects observed in patients taking Adderall include loss of appetite, insomnia, nervousness, tachycardia, and fever. These adverse effects can be attributed to the buildup of the same monoamine neurotransmitters that mediate the desired effects in treating ADHD. Due to these side effects, Adderall has also been FDA approved for the treatment of narcolepsy, and has also been used off-label for the short-term treatment of obesity.

Adderall is a Schedule II federally controlled substance, due to its high potential for abuse, which can lead to psychological or physical dependence. Several studies have demonstrated the effects of mixed-amphetamine salts, such as Adderall, in the treatment of ADHD. One study by Pelham et. al, demonstrated that a single dose of Adderall had positive behavioral effects on school-aged children, such

as decreasing hyperactivity and impulsivity, while also positively impacting various classroom measures.<sup>14</sup> In recent years, rates of Adderall misuse have increased, particularly in the college-aged population, with studies indicating up to 30% of college students abusing prescription stimulants for recreational or academic purposes. Wickman et al. stated that males, members of Greek organizations, and students who often consume other recreational substances are at highest risk of prescription stimulant abuse.<sup>15</sup> When used in a recreational setting, Adderall and other prescription stimulants are commonly combined with alcohol, which places the individual at a greater risk of severe side effects including increased blood pressure, cardiac arrhythmias, and paranoia.

### B. Fentanyl

Medical-grade fentanyl and illegally produced fentanyl are two separate types of synthetic opioids having the same analgesic effect. Nevertheless, they exhibit distinct intended purposes, production processes, supply chains, and security characteristics.

#### 1) Pharmaceutical Fentanyl:

Medical fentanyl represents the fentanyl made and recommended by physicians for the purpose of treatment and therapy. This kind of fentanyl serves as frequently recommended for those who are tolerant to opioids to relieve chronic pain. This is utilized to treat ailments that are encountered after a surgical procedure, oncological therapy, and other highly painful procedures. Medical fentanyl is available in different forms which include patches, injectables, nasal sprays, buccal pills, and lozenges.<sup>16</sup>

Public health organizations rigorously regulate the production, distribution, and dispensing related to medical fentanyl to ensure its proper and secure utilization. This guarantees that the medication is utilized responsibly and decreases the likelihood of misapplication or exploitation. To decrease the potential danger of misuse and excessive consumption, medical professionals regularly supervise individuals who are utilizing fentanyl to alleviate pain.<sup>17</sup>

#### 2) Illicitly Manufactured Fentanyl (IMF):

Fentanyl and similar drugs that have been illegally produced and distributed in secret laboratories or illegal drug markets are highly dangerous and uncertain since they lack quality control and regulation.<sup>16</sup> IMF often gets manufactured in countries with lenient regulations or poor execution of

enforcing regulations. Manufacturing methods lack standardization, resulting in variances in chemical composition and potency.<sup>16</sup>

In the absence of the final consumers' awareness, illegal fentanyl may be mixed with additional compounds such as morphine, cocaine, or counterfeit prescription medication. This practice can result in fatal outcomes because there is no way to be certain of what is contained in illegally produced products. Unknowingly, Fentanyl that is synthetically and unlawfully produced can be significantly stronger than fentanyl obtained legally with its regulated production. Nevertheless, it's crucial to emphasize that producing and dispensing these illicit drugs create notable hazards to the overall public welfare and protection. The possibility of accidental consumption of these agents, which can result in overdose, also concerns firefighters, police personnel, and healthcare workers who serve to protect the health and well-being of the community. Nevertheless, adequate training and preventive measures can lessen the possible harm.<sup>18</sup>

#### Classification:

Fentanyl remains a strong synthetic painkiller which is recommended to alleviate pain with strict monitoring. Fentanyl is classified as a Schedule II controlled substance in the US. The categorization may be contingent on the country's medication scheduling system.<sup>19</sup> In addition, they have currently acknowledged clinical utilization with rigorous constraints and a notable danger of forming severe physical and psychological dependence. Oxycodone, hydrocodone, and amphetamine are examples of additional substances that are listed as Schedule II drugs in the US.<sup>19</sup> This classification as a Schedule II controlled substance acknowledges fentanyl is medically effective for treating pain while also considering the significant potential for wrongful use, exploitation, and dependence. Medical practitioners and "lay" people must recognize the risks of fentanyl usage if it is to ever be used properly. It is important to follow closely the given directions to avoid undesirable outcomes. Moreover, police and government agencies must monitor the way it is used and distributed to halt unlawful manufacturing or distribution that could aggravate the present issues of abuse and the resulting undesirable outcomes.<sup>19</sup>

#### Mechanism of Action:

Fentanyl generates its therapeutic effects by binding to pain receptors inside the central nervous system. The receptors

play a crucial role in the physical process that helps relieve pain, in that they regulate the way pain is detected and conveyed in the brain. The mechanism of fentanyl's action is like other opioids, yet it is significantly more potent and notably more effective in pain relief than morphine.<sup>20</sup>

1. **Opioid Receptor Binding:** Mu receptors, which are spread across the brain and spinal cord, are the areas where fentanyl usually binds. Nevertheless, in instances of excessive dosage, fentanyl can attach to other receptors too. This inhibits the synthesis of pain-indicating neurotransmitters for example, substance P, which decreases the perceived intensity of pain signals.
2. **Pain Modulation:** Fentanyl affects emotional reactions to painful stimuli and diminishes pain sensation by attaching to mu-opioid receptors. This binding not only induces a relief from pain but also a euphoric feeling.

In healthcare situations when immediate pain alleviation is necessary, for example when having a surgical procedure or to manage pain related to cancer, the strength of Fentanyl in pain alleviation is advantageous. Nevertheless, if utilized beyond controlled healthcare environments or in conjunction with different drugs in the illicit market, these identical characteristics furthermore contribute to its elevated risk of dependency and ultimately the possibility of overdosing. The use of Fentanyl should be prescribed and carefully regulated within the healthcare setting to optimize its positive aspects.

### Side Effects:

Just like other opioids, fentanyl may cause various adverse effects. A number of the potential consequences may result in significant harm to the fentanyl using individual, which is dependent on both the amount used, and the route of administration.

1. **Sedation and Drowsiness:** Fentanyl may result in making the person drowsy which could affect thinking and bodily abilities.
2. **Vomiting:** The medication can potentially induce digestive problems which lead to feelings of nausea and vomiting.
3. **Constipation:** Fentanyl, like other opioid medications, may lead to a decrease in peristalsis, which may lead to difficulty passing stools. The correct actions need to be executed to handle this adverse reaction which consists of augmenting fluid ingestion and adding additional fiber to the food intake.
4. **Itching and Skin Rash:** As a result of using fentanyl, a few individuals might sense itchiness or develop dermatitis.
5. **Dizziness:** In certain cases, individuals feel light-headed or dizzy.
6. **Cognitive issues:** Fentanyl usage can lead to impaired judgment, cognitive issues, as well as

- long term impairments of cognitive function.
7. **Hypotension:** Fentanyl may decrease blood pressure, leading to occasional triggering of lightheadedness or passing out along with a range of other cardiovascular issues later if use is persistent.
8. **Respiratory Depression:** The tendency of fentanyl usage to lead to respiratory problems is an issue of great concern as it is often how individuals who are overdosing die. The chemical interaction that occurs in the brain and spinal cord during the use of fentanyl is capable of diminishing brain sensitivity and responsiveness, leaving the individual breathing at a rate that is unable to sustain their bodily functions, which is potentially lethal.

It's crucial to make sure that the medication is utilized in a secure and effective manner. Therefore, everyone who is provided fentanyl needs to be consistently observed by their medical practitioner and should be in a controlled environment.

### Addiction Tolerance and Withdrawal:

Through using fentanyl, addiction may develop which is characterized as the irresistible urge to seek drugs, an inability to regulate drug consumption, and continual use despite adverse consequences. This occurs due to adjustments to the reward and pleasure centers in the brain which intensify the desire to use the substance.<sup>21</sup>

Once the body slowly becomes accustomed to responding to the effects of fentanyl, tolerance arises. As one's tolerance increases, additional amounts of the drug are essential to induce the same levels of euphoria that a smaller dose may have when one first started. It may initiate a dangerous pattern of increasing the used amount, which in turn increases the chance of overdoses.<sup>21</sup>

The use of Fentanyl for a long period could cause physical dependence. Your body becomes adapted to the drug's presence and counts on it to perform normally. In the event that fentanyl results in physical addiction, abruptly decreasing or ceasing to use the drug may cause withdrawal effects. Symptoms of fentanyl withdrawal are highly painful and demanding to cope with. So much so that these adverse symptoms can discourage individuals from trying to cut back their use. Common signs of withdrawal include agitation, aches and pains in the bones and muscles, trouble sleeping, irritation, anxiety, perspiring, shivering, widened eyes, queasiness, and frequent bowel movements.

Due to its strong potency, withdrawal from fentanyl could be fast and more excruciating than withdrawal from other

opioids. Based on factors such as how often and the time span of fentanyl use, the intensity of the withdrawal symptoms can differ in duration.<sup>21</sup> In the context of extended care, psychological treatments, therapy, and mutual aid groups could be utilized to effectively treat the side effects of withdrawal.

### **LEGAL PERSPECTIVES**

#### Stimulant Misuse

The use of prescription stimulants has been a part of the culture on college campuses for years, however recent trends indicate that misuse of these drugs is cause for concern.<sup>22</sup> Studies show that college-aged students, ranging from 18-25 years old are found to use non-medical prescription stimulants such as Adderall at the highest rates.<sup>23</sup> The misuse of Adderall on college campuses is on the rise, with sources estimating that between 4.2% to 35% of college students in the US reported misuse of prescription stimulants.<sup>24,25,26,27</sup> One study found that college students self-report using Adderall at a higher rate than non-college students of the same age range, about 4.2% to 2.2% respectively.<sup>25</sup> Given the potential for abuse within this age group, this is an area of public health concern.

#### Why Do Students Misuse Stimulants?

College students misuse stimulants for various reasons, however, three of the most cited reasons for misuse are to enhance academic performance, recreation, and weight loss.<sup>26-27,30</sup> With the increasing demands of higher education, students take stimulants, such as Adderall, to stay awake for longer hours, or focus for longer periods of time to complete academic work. One study found that 76.1% of students who took stimulants for academic reasons reported a positive effect on their performance.<sup>27</sup> These “positive” effects of taking stimulants consequently lead students to believe that continuing to take these drugs will enhance their academic performance. This type of positive reinforcement can be detrimental in individuals who do not have a diagnosis of Attention-deficit/hyperactivity disorder (ADHD) because the potential for addiction increases.

One major concern in the college-aged cohort is that studies show that those who start misusing stimulants in their youth have a higher likelihood of developing substance use disorder, misusing multiple substances, and not seeking treatment for substance use disorders as they enter adulthood.<sup>28,29,30,31</sup> In reality, these medications only provide a short-term benefit to students without cognitive disorders,

and come with potentially serious consequences, including depression, anxiety, and suicidal ideations.<sup>27,28,30</sup> Some researchers have even suggested that stimulant use can adversely affect a student's academic performance in the long term by reinforcing poor study habits.<sup>24</sup> Another major concern in this population is the rise of polysubstance abuse and overdose on college campuses.<sup>26</sup> Party culture on college campuses allows for an environment in which various drugs and alcohol are mixed, and potential for adverse health reactions increases. Recently, an increasing amount of recreational drugs have been contaminated with Fentanyl, which raises the concern for potential overdoses in which stimulants are involved.

#### Accessibility of Adderall on the Market

For over the past two decades, the diagnosis of attention deficit hyperactivity disorder (ADHD) has steadily increased in the United States. For example, between 1997-2016, the estimated prevalence of US children and adolescents that were diagnosed with ADHD increased from 6.1% in 1997-1998 to 10.2% in 2015-2016. While it is uncertain if the increase in ADHD over the past two decades is due to an increased prevalence of ADHD in children, or an increased number of children being diagnosed, it is clear that prescription stimulants to treat ADHD, such as Adderall, are becoming more accessible to patients.<sup>32</sup> As of 2016, 62% of children with a current diagnosis of ADHD in the United States were taking medication, 46.7% had received behavioral treatment for ADHD, and 23.0 % received neither treatment.<sup>33</sup> Despite some individuals with ADHD not receiving any treatment for their condition, there are more adults receiving prescription Adderall than there are with a formal ADHD diagnosis, due to an increase in digital mental health platforms which have significantly increased prescribing practices.<sup>34</sup> Additionally, social media has become a source of non-prescription Adderall, making the purchase of counterfeit pills even more of a concern. Amidst the recent Adderall shortage, public health concern is growing as people become desperate to find stimulants regardless of possible risks.<sup>35</sup>

#### Accessibility of Adderall for College Students

The abuse rate of Adderall and other prescription stimulants coincides with the rapid rise in physician prescribing of stimulants for ADHD.<sup>36</sup> One study surveyed 58,000 college students at 15 academic institutions and found that 26.4% of respondents reported that stimulants were easy or very easy to obtain.<sup>26</sup> In the same study, 76.9% of students indicated

that they received their stimulant supply from a friend who had a medical prescription.<sup>26,37</sup> This accessibility is of high concern, as Adderall is a schedule II drug, with high potential for abuse. For those who do not have ADHD, Adderall will cause a surge of neurotransmitters resulting in a euphoric effect that increases the likelihood of addiction.<sup>38</sup>

For students who have a medical prescription for Adderall, but don't take the medication as prescribed, there are many incentives to sell the medication for profit. A google search will result in several websites which teach students with excess Adderall to sell the drug for profit to fellow students. Additionally, Adderall can be purchased from other avenues other than fellow students, and with the recent Adderall shortage, acquisition of Adderall from unregulated sources is cause for even greater concern. These sources include online drug markets and social media referrals.<sup>39</sup> Non-prescribed stimulants are more lethal than ever before, due to contamination with Fentanyl. Between 2019 to 2020, the rate of drug overdoses involving a psychostimulant drug increased by about 50%.<sup>40</sup>

### **ETHICAL ANALYSIS**

Adderall is a prescription medication that contains two drugs: amphetamine and dextroamphetamine. It belongs to a class of medications called stimulants. It's most commonly used to treat attention deficit hyperactivity disorder (ADHD). Unfortunately, over the years this drug has been misused by college students. There are these myths that Adderall is safe, non-addictive, no different than using legal stimulants and it will make you smarter by keeping you more focused. These are myths. "While Adderall may make you feel more focused and can keep you alert during those long nights of studying, a 2018 study into the medication's actual benefits found it actually did very little to improve neurocognitive performance in neurotypical college students."<sup>41</sup> Unfortunately, a 2016 study found that as many as 50% of college seniors reported experimenting with Adderall as a study aid.<sup>42</sup> To complicate this issue, recently, Adderall has been found to be laced with illicitly manufactured fentanyl, which has led to addiction, overdose and death. To combat this issue, we need better education about Adderall and fentanyl, and we need to advocate for the use of fentanyl test strips at locations like safe injection sites to save lives. This recommendation, however, is controversial. Some in the United States see it as advocating for the use of illegal drugs. The issue today is that it has now become a matter for life and death.

Society, in general, has always recognized that in our complex world there are times when we are faced with situations that have two consequences--one good and the other evil. The time-honored ethical principle that has been applied in these situations is called the principle of double effect. As the name itself implies, human action has two distinct effects. One effect is intended and good; the other is unintended and harmful. As an ethical principle, it was never intended to be an inflexible rule or a mathematical formula, but rather it is to be used as an efficient guide to prudent moral judgment in solving difficult moral dilemmas. This principle focuses on the agent in terms of intentions and accountability, not just contingent consequences. The principle of double effect specifies four conditions, which must be fulfilled for an action with both a good and a harmful effect to be ethically justified:

- 1) The action, considered by itself and independently of its effects, must not be morally harmful. The object of the action must be good or indifferent.
- 2) The harmful effect must not be the means of producing the good effect.
- 3) The harmful effect is sincerely not intended, but merely tolerated.
- 4) There must be a proportionate reason for performing the action, in spite of the harmful consequence.<sup>47</sup>

The principle of double effect is applicable to the issue of using fentanyl test strips to determine if the Adderall is laced with fentanyl because it has two effects, one good and the other harmful. The good effect is that upon learning that the drug is laced with fentanyl the drug user becomes more attuned to the severity of their circumstances and becomes more cautious. The harmful effect is that some believe that it may send a wrong message that risky drug use is condoned and even encouraged. This could lead to scandal. To determine if the distribution of fentanyl test strips is ethical, this issue will be examined in light of the four conditions of the principle of double effect.

The first condition allows for the distribution of fentanyl test strips because the object of the action, in and of itself, is good. The moral object is the precise good that is freely willed in this action. The moral object of this action is to decrease overdoses and addiction and potentially save lives by providing accurate information to the drug user about the content of the drug. The immediate goal is not to endorse drug behavior or to encourage it. Rather, the direct goal is

offering an effective prevention tool for drug addicted men and women, in order to help individuals and to decrease drug addiction and deaths. The second condition permits making fentanyl test strips available by health care professionals at community-based organizations and clinics, such as safe injection sites, as an alternative prevention tool for drug users because the good effect of offering an effective alternative prevention tool that can save lives is not produced by means of the harmful effect. The two effects are completely independent. Making fentanyl test strips available at approved community-based organizations and clinics coordinated by qualified health care professionals have no intention of encouraging risky drug use. In fact, the opposite is true. To argue that public health officials are encouraging or condoning risky drug use is illogical. This is “like suggesting that airbags and seatbelts encourage unsafe driving.”<sup>43</sup> The third condition is met because the direct intention of making fentanyl test strips available is to protect and preserve human life and to encourage drug prevention, education, social support, professional counseling, testing and medical care. We know the use of fentanyl screenings has been found to change behavior amongst people who inject drugs. Johns Hopkins and Brown Universities conducted a pilot study investigating the impact of fentanyl testing with IV-drug users. Using a simple \$1 testing strip dipped in the drugs mixed with water, the study has shown that people who received positive fentanyl results tend to 1) use less, 2) inject with someone around and/or 3) to use more slowly.<sup>44</sup> The direct intention of this program is to preserve the lives of the most vulnerable men and women. This is accomplished by decreasing potential overdoses and indirectly, through education and other prevention techniques, the potential for death. The foreseen but unintended consequence of this may be the belief by some that this is condoning and even encouraging risky drug use. One might also argue that it could give a “false” sense of security to those who engage in risky drug use. Nevertheless, there is no scientific evidence that proves this will encourage or even increase drug use. In fact, research shows that the opposite is true. Finally, the argument for the ethical justification of making fentanyl test strips available by the principle of double effect focuses on the fourth condition of whether there is a proportionately grave reason for allowing the unintended possibility of scandal and the possibility of increased risky drug use. Proportionate reason is the linchpin that holds this complex moral principle together.

Proportionate reason refers to a specific value and its

relation to all elements in the action.<sup>45</sup> The specific value in allowing for fentanyl test strips is to preserve human life by decreasing drug overdoses and encouraging responsible behavior to vulnerable members of society. The harm, which may come about by trying to achieve this value, is the foreseen but unintended possibility that some may view this as condoning and even encouraging risky drug use. The ethical question is whether the value of preserving human life outweighs the harm of the foreseen, but unintended, possibility of scandal and possible increased risky drug use? To determine if a proper relationship exists between the specific value and the other elements of the act, ethicist Richard McCormick, S.J. proposes three criteria for the establishment of proportionate reason:

- 1) The means used will not cause more harm than necessary to achieve the value.
- 2) No less harmful way exists to protect the value.
- 3) The means used to achieve the value will not undermine it.<sup>46</sup>

The application of McCormick’s criteria to making fentanyl test strips available nationwide as an alternative prevention tool, supports the argument that there is a proportionate reason for allowing this program. First, according to public health officials, the use of Fentanyl test strips, as part of a comprehensive drug prevention program, can decrease drug overdoses and addictions, decrease the use of medical resources and potentially save lives. Various studies have illustrated the concrete benefits that broader distribution of these strips can have on persons who use drugs and society as a whole.<sup>47-48</sup> For example, in a 2019 study of individuals from the Southeastern United States, persons who inject drugs that received a positive fentanyl test strip result were five times more likely to change their drug use behavior compared to those receiving negative results.<sup>7</sup> There drug use behavior changes include shifts to more harm reduction practices, such as smaller dosing, having naloxone close by, only using drugs in the presence of others, or choosing not to use drugs at all. Second, at present, there does not appear to be an alternative that is as effective as fentanyl test strips for at-risk individuals. It is true that other means of prevention exist in regards to drug addiction, such as abstinence or forced drug rehabilitation but according to health care authorities, abstinence is not realistic for many at-risk individuals and unless a person is agreeable to rehabilitation, it has been shown not to be effective. A 2016 research review shows why. Of the nine studies included, five found

no significant reductions in drug use or crime among people who underwent required treatment, and two studies found that mandated therapy made those measures worse. Only two studies found a small benefit in short-term recovery. This is in contrast with the strong literature on voluntary medication use for opioid addiction, which shows that it can reduce mortality by 50 percent or more.<sup>49</sup> Using fentanyl test strips at Safe Injection Sites can reduce the harm of addiction and even overdoses and death. Upon learning fentanyl was laced in the drugs acquired, I-V drug users became more attuned to the severity of their circumstances and became more cautious. As individuals with opioid use disorder, I-V drug users proceeded to inject at their own risks but were more cognizant of their safety. Therefore, offering fentanyl testing kits in a safe injection site would be beneficial in allowing I-V drug users to become more conscious of their present reality and potentially seek assistance in rehabilitation and detoxification.<sup>50</sup> The critical aspect that cannot be overlooked in making fentanyl test strips readily available at various supervised sites for at-risk individuals is the element of human contact. This human contact allows health care workers to form personal relationships with at-risk individuals and thus provide the opportunity to offer them appropriate health care, personal counseling, testing and referrals to treatment centers. Various scientific studies have confirmed that intravenous drug users reduce risk-laden behaviors when pertinent information and services, such as counseling are made available, and especially when they are offered by peers who are members of the drug-using subcultures.<sup>51</sup> Making fentanyl test strips available to at-risk individuals by trained health care professionals not only has the potential to save human lives but also to foster human dignity and respect. Third, fentanyl test strips do not undermine the value of human life. One can argue convincingly that the intention of making fentanyl test strips available to at-risk individuals by trained health care professionals is to save human lives and from current data in Canada it appears to be quite effective. This is a public health issue that must be addressed because innocent people are overdosing and potentially these lives could be lost. It seems clear that there is a proportionate reason to allow fentanyl test strips to be made available in the United States using taxpayer money. Fentanyl test strips contribute to the well-being of at-risk individuals and society as a whole because this tool has the potential to decrease overdoses and addiction and ultimately, save medical resources and human lives. It also offers those who are at-risk the opportunity to realize that they are valued as persons

and that with the appropriate assistance drug overdoses can be avoided and many lives can be saved. Therefore, it is ethically justified under the principle of double effect to allow for fentanyl test strips to be made available to at-risk individuals at approved community-based organizations that are coordinated by health care professionals. Ethically, the greater good of those individuals at-risk and the common good of society are advanced by financially supporting the use of fentanyl test strips in major cities in the United States.

## **RECOMMENDATIONS**

### 1. Safe Injection Sites

Our first recommendation for improving the state of the opioid epidemic and the mitigating of the damages caused by fentanyl in particular is the implementation of Safe Injection Sites (SISs). SISs also known as Safe Injection Facilities (SIFs) are a critical and controversial aspect in the fight against the opioid epidemic. Although government sanctioned SISs were first created in Europe, Vancouver, British Columbia, Canada became the first instance of a city in North America to house a SIS.<sup>52</sup> This Canadian SIS led the way for SISs being introduced into the United States. Primitive versions of SISs included sterile needle distribution, medical supervision, social services, and overdose prevention.<sup>53</sup> “The US should implement sites like these following the model of the CUES proposed in Philadelphia in 2018. This model uses Insite (Vancouver, Canada) as a paradigm, while adding services such as wound care, Hep C/HIV screenings, needle exchange, Narcan distribution, early education, counseling for rehab, and fentanyl screenings.”<sup>53</sup> The purpose of the SISs are to provide people who inject drugs with sterile needles for drug injecting, while providing supervision in case of an overdose.<sup>54</sup> In the event of an overdose, supervisors will attempt to revive the person experiencing an opioid overdose using naloxone or a similar drug.<sup>55-55</sup> Naloxone is a fast acting drug used to combat opioid overdoses, yet the people overdosing at the SISs will still need medical attention after have being administered naloxone.<sup>56</sup> The people who are injecting the drugs also learn healthier practices while in the SIS, such as injecting drugs while indoors, using clean water for injection, and cooking or filtering the drugs firsts before injecting them.<sup>56</sup> While there is pushback due to the perception of these sites enabling people who inject drugs, it is believed that these sites will in general reduce overall harm through both medical and societal methods.<sup>55</sup>

SISs also as a way for people who inject drugs to access



counseling and psychiatric help.<sup>57</sup> As drug use in the United States is considered an addiction, and addictions are categorized as a “chronic relapsing disorder”, SISs work to destigmatize the disease that is drug addiction.<sup>54</sup> SISs work under the harm reduction model.<sup>54-55,57</sup> SISs have shown apparent progress in communities to reduce the harm of injecting drugs as there have been reports of people being more likely to have started drug treatment after visiting a SIS than others who have not.<sup>57</sup> Also the presence of medical care along with a more calming atmosphere with the SISs might have led to there being no reported deaths within an SIS.<sup>57</sup>

In overdose deaths, at least one opioid is involved in 81.9% of all overdoses in the United States, and illicitly manufactured fentanyl's account for the majority of these opioids.<sup>57</sup> SISs serve to reduce the effects of drug use through medical, educational, and systemic means. Although SISs do not specifically target the fentanyl, instead addressing the broader issue of the opioid epidemic; we recommend SISs as we believe that their contributions to reducing the amount of overdose deaths paired with the increased awareness of opioids, including fentanyl, circulating through the national illicit drug supply, SISs are incredibly important in improving the symptoms of the current epidemic.<sup>54</sup>

### 2. Lowering Entry barrier to addiction treatment

This increase in opioid abuse over the last 30 years or so can be, in part, attributed to doctors over prescribing painkillers to the general population, resulting in substance use disorder (SUD) in many individuals. To curb this epidemic, addiction treatment is essential, yet there are several barriers preventing individuals from gaining access to such treatment.

The first barrier is economics. Opioid addiction treatment remains expensive with individuals often having to pay large out of pocket costs even after insurance subsidizations. As one may expect, this method is unavailable to less well-off Americans who have to rely on Medicaid to pay for their addiction treatment. Opioid treatment drugs, such as methadone and buprenorphine, are not under Medicaid coverage in several states, making addiction treatment a huge financial burden for individuals in the program.<sup>58</sup> In states where Medicaid is available, treatment companies which accept Medicaid will add further steps which only increase the barriers to treatment. Examples of this included increased documentation, mandatory counseling alongside

treatments, and additional copayments. Increased documentation increases both patient and physician burden, while copayments and counseling introduce additional expenses contributing to the difficulties receiving this treatment for the patient.

Alongside economic barriers, racial barriers are another contributing factor to the lack of individuals in need receiving this vital treatment. Despite white Americans suffering at higher rates from opioid abuse disorders, minority groups are more likely to die from the disorder, “Native Americans with OUD are 7 times more likely to die, and African Americans two times more likely to die” when compared to white counterparts.<sup>59</sup> Minorities face racial discrimination in receiving drug addiction medications like buprenorphine and methadone which are distributed unequally among ethnic groups. Communities of color are typically prescribed methadone during treatment. This is problematic because it is a “full opioid agonist and thus is more lethal if misused”.<sup>60</sup> Methadone's status as a full opioid agonist results in the drug being more regulated and subsequently more difficult to acquire for individuals in need. Additionally, methadone has a history of being forced on black communities by police, creating a strong negative stigma around taking the drug. In contrast white Americans are often prescribed buprenorphine, which is less regulated, unstigmatized, and more safe, all factors contributing to their better outcomes from the disorder. If we are to slow this epidemic, a plan must be devised that does not overlook these factors and is equitable with the resources available.

### 3. Fentanyl test strips

Fentanyl Testing Strips (FTS) are a harm reduction intervention which all individuals who use unregulated narcotics should be aware of. Originally created to detect fentanyl in urine samples, FTS are examples of competitive lateral flow immunoassays that can now be used to sense fentanyl in liquid drug solutions.<sup>61</sup> In general, these strips are inexpensive, easy-to-use, and produce rapid results given this technology.<sup>62</sup> The principle of such technology begins with the preparation of a liquid sample, which is done by adding a small amount of water to a portion of the desired drug in a clean container.<sup>63</sup> Then, this liquid sample is placed on a testing strip, which subsequently encounters fluorescently-tagged antibodies specific to the analyte of interest.<sup>63</sup> As the liquid moves down the strip via capillary action, it encounters the detection zone containing either antibodies or antigens to which the fluorescently-tagged

antibodies can bind and emit fluorescence, depending on the contents of the liquid sample.<sup>63</sup> For FTS specifically, if fentanyl is in the sample, it binds to the initial antibodies and prevents interaction from occurring at this detection zone, resulting in a lack of fluorescence.<sup>63</sup> If fentanyl is absent from the sample, the interaction at the detection zone will take place, and a test line will appear at the appropriate location on the strip.<sup>63</sup> In both instances, a control line will be present at the end of the strip, indicating that the sample has traveled far enough to produce accurate results. Therefore, one line indicates a positive test for fentanyl while two lines indicates fentanyl's absence from the sample.<sup>63</sup>

With the use of this technique comes a significant risk of false positive tests due to the presence of illicit stimulants like methamphetamines and MDMA.<sup>64</sup> The amounts at which these drugs are commonly sold have been shown to produce positive tests when regularly diluted.<sup>65</sup> Researchers suggest that given the strips' sensitivity to fentanyl, erring on the side of caution and over diluting the sample can help guard against false positives because fentanyl can be detected at such low amounts while the other substances require higher concentrations for detection.<sup>65</sup> The strips have been shown to be anywhere from 96%-100% accurate in detecting fentanyl.<sup>65</sup> However, the issues of how much to dilute the samples and interpretation of ambiguous results, are remaining barriers to the full benefits of the ability to detect fentanyl.

Beyond the risks and benefits of these strips, the significance of allowing individuals who use drugs the opportunity to protect themselves from fentanyl consumption cannot be overlooked. Various studies have illustrated the concrete benefits that broader distribution of these strips can have on individuals who use drugs and society as a whole.<sup>66-67</sup> For example, in a 2019 study of individuals from the Southeastern United States, individuals who inject drugs that received a positive FTS result were five times more likely to change their drug use behavior compared to those receiving negative results.<sup>68</sup> These drug use behavioral changes include shifts to more harm reduction practices, such as smaller dosing, having naloxone close by, only using drugs in the presence of others, or choosing not to use drugs at all.<sup>66</sup> The demand for these strips is also present in vulnerable populations shown by a 2018 study conducted by Johns Hopkins Bloomberg School of Public Health where 85% of people who believed they had consumed fentanyl at least once wished they had known fentanyl was present before

consumption.<sup>67</sup>

In all, while the false positive rate and cross contamination of mixed drugs are an issue for FTS use, the accuracy, feasibility of use, and impact that FTS can have on individuals who use drugs indicate that it can be a potentially life-saving intervention for many. The addition of standardized criteria for diluting samples and decreasing the risk of false positive tests can make this intervention even safer and more effective. Perhaps the most effective way to roll these out more broadly would accompany the implementation of safe injection sites, as education and training on FTS could take place at these locations coinciding distribution of the strips.

### 4. Prescription diamorphine

Opioids are often used to treat severe or chronic pain as anyone who has even undergone a major surgery has experienced.<sup>68</sup> Diamorphine, also known as heroin, is one such opioid that is used to reduce chronic pain. It is a type of narcotic analgesic agent also known as diacetylmorphine hydrochloride.<sup>69</sup> These painkillers have shown to be effective in treating mild, moderate, or severe pain. Diamorphine works by mimicking the action of naturally occurring pain-reducing chemicals called endorphins.<sup>70</sup> Endorphins are found in the brain and spinal cord and serve to reduce pain by binding to opioid receptors and halting the interpretation of nociception from reaching the brain.<sup>71</sup> Diamorphine mimics this action of endorphins and as a result, blocks the transmission of pain signals sent by the nerves to the brain.<sup>71</sup> Therefore, even though the cause of the pain may remain, less pain is interpreted by the individual who is that is taking the medicine or naturally producing endorphins.<sup>71</sup> In the United States, heroin is not accepted as medically useful, yet in the United Kingdom, it is prescribed in times of severe pain.<sup>71</sup>

Prescription Diamorphine can be a viable option in opioid withdrawal treatment where methadone fails. There are two different hypotheses for how diamorphine can be used in this manner:

1. "Some individuals tolerate methadone poorly – whether due to side-effects or to poor control of withdrawal symptoms – and may experience better symptom control from diamorphine".<sup>72</sup>
2. "Some individuals seek a more reinforcing drug than methadone. Access to diamorphine may be one of the few motivating factors for some long-term addicts who have become demoralized and lost the expectation of experiencing other rewards in life".<sup>72</sup>

This option has shown to be effective based on a randomized study of individual receiving injectable heroin reporting less use of street heroin than those randomized to methadone...”.<sup>72</sup> Prescription diamorphine as a treatment option for individuals suffering from opioid use disorder is something that should be considered by clinics working against the opioid epidemic.

### 5. Soar Initiative-Ohio State University

After recognizing how the current state of public health was failing to slow down the Opioid Epidemic at Ohio State and its surrounding areas, a group of students set out to make change in the way that the epidemic is approached. They developed the Safety, Outreach, Autonomy, and Respect initiative or the S.O.A.R. initiative, which seeks to prevent overdoses and save lives utilizing harm reduction practices. SOAR builds “innovative technology that promotes connection and ... [provides] ... on-the-ground support throughout Ohio, ... [striving] ... to empower people who use drugs to build strong, healthy communities”<sup>73</sup>. The S.O.A.R. team developed an app which allows individuals to report contaminated batches of drugs which will alert all users of the app in the area. By utilizing this type of technology, addicts, although still using, will stay alive long enough to the point where they are ready to get to a rehab facility. They also provide resources such as fentanyl test strips and naloxone to further prevent overdoses.

Not only is this initiative valuable because of the resources they provide but also because of the community that they have fostered who are actively working for this cause. Having a support system and a group of like-minded individuals to talk to can be of great value while working through issues such as overcoming addiction or dealing with a family member's addiction. Although S.O.A.R. is just one example of an initiative working against this epidemic, their model can and should be applied in communities throughout the United States which are being devastated by the Opioid crisis.

### CONCLUSION

With Fentanyl only seeming to be increasingly prevalent in the last few years, it is vital that measures are taken to slow the spread of this epidemic to save innocent lives. With 21,089 opioid induced overdose deaths in 2010 and 80,411 in 2021, the prevalence of these laced substances is evidentially associated with the increasing number of opioid induced deaths per year.<sup>74</sup> If we are to slow this epidemic, we must engage policy makers, educators, as well as the

public of the resources that are available to prevent addiction as well as resources that may aid in the recovery from it. By broadcasting these recommended resources and raising the general level of education about the epidemic, these rates of increasing opioid use and opioid associated deaths may begin to fall back to pre-epidemic levels. For this to happen, first the epidemic and its full ramifications must be parsed out and the tragedies must be acknowledged by the public of the US and around the world.

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