Putting Together the Pieces of the Puzzle: The Development of an Opioid Abuse Triage Checklist for Emergency Departments

By

Jeremy Mani

Thesis

Submitted to the Faculty of the

Graduate School of Vanderbilt University

in partial fulfillment of the requirements

for the degree of

MASTER OF ARTS

in

Medicine, Health, and Society

May 10, 2019

Nashville, Tennessee

Approved:

Derek M. Griffith, Ph.D.

Lauren Gaydosh, Ph.D.

Table of Contents

List of Tables

Introduction

The Opioid Epidemic

A fire has started in our healthcare system, burning across America. The Opioid Epidemic, feared as the most unstable and unstoppable health crisis throughout America, has revealed concerning statistics involving addicts and abusers (Kolodney et al, 2015). The National Institute on Drug Abuse reports that 21 to 29 percent of patients prescribed opioids develop an addiction to them (Diez Roux, 2017). In 2015, more than 33,000 people died due to opioid overdoses. That same year, 2 million patients suffering from substance use disorders were primary users of opioids. As every year passes, the casualties to this Epidemic increase with little to no sign of stopping (Rudd, 2016).

To make matters worse, the most recent calculation by the NDI indicates that 47,800 people died of opioid overdose in 2017. This means that in two years, the number of mortalities due to opioid overdose increased by almost 50%. If extrapolated for the next two years, if the epidemic continues at the same rate, opioid overdosage will cause almost 72,000 deaths in 2019. For perspective, updated statistics reported by the CDC estimate the combined deaths of motor vehicle accidents and gun violence rests at 71,673. For further understanding, opioid overdose, if the population of opioid abuser continues at the same rate as the past 4 years, would be the eighth largest cause of death in the United States, between diabetes and influenza/pneumonia. By the numbers alone, the Opioid

Epidemic rests its case as an extremely crucial clinical issue to handle that continues to rise rapidly through the ranks of fatal conditions afflicting this country.

The Epidemic itself has crossed borders, with a study of Emergency Departments in Alberta, Canada reporting a 57.3% increase in patients with opioid abuse (Moe et al, 2018). Evidence also demonstrates that opioid users have a high risk of transitioning to less stable and more unregulated drugs such as heroin and fentanyl (Dasgupta et al, 2017). Considering that as of 2017, the combined fatalities from overdose on illicit drugs and opioids already exceeded 72,00, the current projection of fatalities for 2019 overtakes Alzheimer's diseases as the sixth leading cause of U.S. deaths. Ultimately, the American healthcare system is struggling to find a solution to the Opioid Epidemic, and until effective systems are in place, the rates of opioid addicts and overdoses will continue to rise (Nelson et al, 2015).

With a demographic as afflicted as people suffering from opioid abuse, a huge clinic need and burden follows (Machikanti et al, 2012). Current interventional methods are considered expensive and largely ineffective (Sahota et al, 2018). Of the 1555 articles searched and analyzed by Sahota and her team only found 6 to provide measurements that qualified for evaluation. None of these six actual produced results that were statistically significant or valid. In 2007, it was estimated that opioid abusers cost insurers an estimated $72.5 billion (Volkow et al, 2014) This financial estimation is a similar economic burden as HIV/AIDS and asthma. The projection of the economic burden for the Opioid Epidemic unfortunately continues to grow at a rapid rate. Altarum, a nonprofit health consulting institute estimated the cost of the Opioid Epidemic in the United States from 2001-2017 to exceed $1

trillion (Altarum, 2018). In 2017 alone, the epidemic created approximately 115 billion dollars in waste.

However, the economic burden does not dictate the need for treatment—people still need help. Where these victims seek help and guidance for treatment of their addiction varies throughout the United States, but as a consistent rule, Emergency Departments are the gateway for patients suffering from substance abuse disorders involving opioids (Hawk and D'Onofio, 2018). In consequence of this, the Emergency Department is also the gateway for patients seeking treatment for opioid abuse—where the furthest interventional advancements occur. Here, clinicians are able to provide knowledge on the prescription of opioids, identify patients potentially suffering from drug abuse, and reduce patient usage of opioids through maximization of alternative medication.

Diseases of Despair

Patients in need of treatment due to the opioid epidemic don't always appear with a primary complaint of overdosage. The 2017 Brookings Report headed by Case and Deaton highlight a growing clinical population within the United States—patients suffering from deaths of despair (DoD). Patients suffering from deaths of despair attribute overdose, completion of suicide, and death due to liver failure directly to substance abuse. In continuation of this developed term, diseases of despair affect the population currently suffering from substance abuse that leads to these comorbidities. Diseases of despair are unique in form due to the populace they are affecting. An article from the Washington Post illustrates this unique population

through the contrast of typical populaces suffering from a chronic disease. Conditions such as diabetes typically affect minority populations but statistics show that DoDs have taken a stranglehold on middle-aged white people. White males between the ages of 45 and 55 are the hardest hit by this growing affliction, with a strong correlation between a lack of education and the rate of the disease. One article calculated a four to six percent increase in premature deaths involving DoD in white people aged 25 to 64 years in a single year (Diez Roux, 2017). This unusually affected demographic bears mentioning, as this dictates the ability of physicians to properly treat, diagnose, and detect opioid abusers. The fact that white males are affected by the Opioid Epidemic more than any other population bears mentioning and monitoring throughout this thesis.

Important to this population is the narrative that follows it towards opioid abuse and addiction. Case and Deaton stress that the lack of education amongst this population leads them to develop these DoDs. With the current state of the economy and our modern society, these men find it difficult to work jobs with a wage to support a family. With rates of diseases of despair higher in places of economic turmoil such as Appalachia and the Rust Belt, the narrative only strengthens. To further the frustration for this group, their parents managed to raise families without a college or even high school education. So with this sense of failure hanging over their heads, they become susceptible to "despair" or a sense of hopelessness. Coupled with mental illnesses, this leaves these men vulnerable. Ultimately, whether through prescription medication to combat pain from an injury or even from the

black market, they become exposed, and eventually, addicted to opioids. These opioids quickly become a valve with which they can ease the pain of their DoD.

Taking this narrative into account, the population of patients suffering from diseases of despair remains relatively understudied, undertreated, and underrepresented in previous literature. Evidence clearly shows that diseases of despair could develop into a serious clinical issue. However, recent evidence believes that the term diseases of despair limits the scope or even creates problems in the proper understanding of patient populations suffering from specific ailments. A report by Bilal and Diez-Roux revealed that the bigger data shows not only are white males a demographic that is dying at an increasing rate—every demographic group minus non-Hispanic white females are (Bilal and Diez-Roux, 2019). A Stanford study supported this idea, theorizing that the Opioid Epidemic makes a negative impact on every demographic throughout the northeastern United States (Kiang et al., 2019). Woolf and his colleagues even calculated that Native Non-Hispanic American Indians and Alaskan Natives suffered from some of the highest opioid addiction rates (Woolf et al., 2018).

Ultimately, diseases of despair provide compelling perspective and labeling of a suffering population, but research suggests more nuance to the narrative. One study highlights that the Brookings Report missed on the interaction between place and race. These interactions in turn often are driven by other factors such as finances and cultural norms (Stein et al., 2017). The important points drawn from these differing opinions culminate in the fact that there are consequences when framing clinical issues with specific terms. There are people who suffer from liver

disease, suicidal ideations, and overdose who don't fit the mold of diseases of despair. Throughout my thesis, I want to ensure that I don't forget this important concept. It is vital to be sensitive to the stereotyping of labeling a patient as someone who suffers from DoD and the consequences that might follow. However, in terms of the opioid epidemic I believe that the term disease of despair depicts an important aspect of society that other, more objective labels, would not. The emotion of despair allows the narrative of the individual to play an important part of their clinical outcomes. The Opioid Epidemic often dehumanizes patients suffering from addiction, and the opportunity to include their narrative in a clinical diagnose provides a voice for the individual.

I want to use the term disease of despair as a primary target of a proposed opioid abuse triage checklist, as the concept also encapsulates the nuance of patient presentation in Emergency Departments. A study conducted in Florida using the sibling term "deaths of despair" showed that such a targeted field allowed them to better categorize their patients, and ultimately led to conclusive results (Zeglin et al, 2018). Oftentimes, patients do not appear in the ED with a primary complaint of opioid abuse. People present with suicidal tendencies, liver failure, and the various symptomology associated with DoD. However, it is the primary cause of opioid abuse that connects these patients.

Intervention

In order to direct patients within the Emergency Department suffering from opioid abuse towards proper care, I intend to conduct an investigation into the

potential benefits of the implementation of an opioid abuse triage checklist. A checklist, conducted in real time by clinicians on patients that fit certain criteria (based on patient history and current symptomology), would enable physicians and nurses to efficiently process the patients. Patient history will be an important factor in inclusion criteria, as studies suggest it as a reliable outcome predictor (Barata et al, 2017). This in turn would standardize the treatment process, enhance the physician counseling content, and optimize referrals to proper treatment facilities in order to minimize long-term patient health. Once processed through the checklist, this patient's future history could then better capture the total symptomology of the patient, allowing the doctor to effectively profile and treat them, as post-treatment history can be a powerful clinical tool when encountering readmission (Berg et al, 2018).

This investigation into the implementation of such a checklist within the Emergency Department is important for two specific reasons. Primarily, this investigation's importance rests in the dire need of assistance in the current Opioid Epidemic. As previously mentioned, this population is increasing every year, particularly within Emergency Departments. To develop an economical, standardized method of improving patient care for these patients would help mitigate the current influx. Secondly, there has not been a specific interventional study with this specific topic, population, and location in mind. There have been investigations (which I will later analyze in detail) involving triage checklists with other mental illness conditions, and there has been profiling of diseases of despair in

the general population, but these two components have not been synthesized of yet during my findings.

Pieces of a Puzzle

Ultimately, I intend to begin to identify the various pieces of the puzzle of the Opioid Epidemic. First, it is important to provide the greater context and space in which the opioid epidemic currently is located. Next, I believe that focusing in on a gateway to healthcare, the Emergency Department, allows for a concrete lens in which to begin understanding the patient population. An evaluation of previous interventions within the Emergency Department on mental illnesses and multi-faceted conditions such as opioid addiction should follow this focus. Finally, I intend to conduct a brief investigation of any literature specifically mentioning the treatment, diagnosis, or detection of opioid addiction within the Emergency Department. The literature currently provides extensive material about the four separate components of this puzzle, but to complete the greater image of the epidemic requires the combination of these four concepts.

The ultimate intent of the research conducted in this thesis centers around the ability to understand the targeted population. An effective triage checklist will contain every element and characteristic of the general population of people suffering from addiction and opioid abuse. These characteristics may range from current symptoms and conditions, to a previous record of prescription opioids. The important part involves encapsulating all variations and every narrative of the Opioid Epidemic without unnecessarily targeting one demographic over another.

Once I place the pieces together, I intend to utilize the knowledge gained from this review to draft a comprehensive opioid abuse checklist. The intention of such a checklist involves a list of criterion to better detect potential victims of opioid abuse through components such as patient history, history of diseases of despair, and a variety of other aspects to be developed in the continuation of this thesis. If I properly synthesize the literature and glean an understanding of the subtleties of this condition, I believe I will have the tools to develop a proper triage checklist with clinical impact.

Methods

This thesis contains five additional sections—a literature review, an autoethnography, the conclusions made from this investigation, the draft of an opioid abuse triage checklist for ED use, and finally a reflection on future directions for this study. As I previously provided the initial context of the Opioid Epidemic, the literature review aims to provide a background on the specificities of the condition itself, where it manifests in the healthcare mechanism, and how to best handle the treatment of this ailment. More specifically, I intend to use the review to show each of the "pieces" that make up "the puzzle" that is the Opioid Epidemic. The review first travels to the Emergency Department where it focuses on the relationship between this institution and the opioid epidemic. Then follows a summation of the current treatment protocol involved with diseases of despair and opioid use. Finally, I introduce the concept of mental health triage checklists in the

ED, the current results of such interventions, and the interventions specific to opioid abuse.

The autoethnography allows me to provide a firsthand account of my time as a medical scribe witnessing Emergency Department's interactions with the opioid epidemic and "diseases of despair". This section opens up the perspective of not just patients suffering from this epidemic, but also the providers who struggle to find the best practices for caring for these people. Here, I highlight key situations that shaped the direction I wanted to head towards with my draft triage checklist.

In my conclusion, I combine the knowledge learnt from both experience in the ED and data collected from my literature review. Here, I put the spotlight on specific attributes of patients suffering from opioid abuse in the Emergency Department, and how to best detect their presence in the ED. This section boils down the concepts addressed in the literature review and autoethnography to key points that constitute the makeup of the triage checklist.

The ultimate goal of the "diseases of despair" triage checklist is to synthesize my understanding of the patient population affected by the Opioid Epidemic and how to best detect and diagnose these patients. I use an acronym to best present the findings in an easily memorized way. My intention with the use of an acronym mitigates the amount of training for healthcare providers. Training, difficult checklists, and complex processes all lead to increase potential in error. Due to my lack of expertise and knowledge in creating high-powered checklists, I also intended to keep the proposed acronym simple and comprehensive.

Literature Review

The Emergency Department

Patients suffering from substance abuse, and particularly opioid abuse, find their easiest access to care in Emergency Departments. However, Emergency Departments (EDs) are notoriously busy. EDs are available for every patient, 24/7, and the consequences of such an "open door" policy are wait times that can be measured in hours, understaffing, over-capacity, and a high-stress environment. Recently, there has been an incredible uptick in mental health patients seeking assistance from Emergency Departments. These patients range in symptomology from suicidal ideations to substance abuse. According to recent studies, approximately one in eight patients presenting to the Emergency Department has mental health as a primary complaint (Pearlmutter et al, 2017). If we apply that statistic to the 141.4 million people that visit the Emergency Department annually, we are now studying a demographic 17.68 million large. This is by no means an insignificant population.

Unfortunately, Emergency Department does not have the resources to properly treat a situation as delicate and complex as a patient with a mental illness (Pearlmutter et al, 2017). ED physicians and nurses are highly specialized staff, but do not necessarily have the requisite training for a patient in need of more long-term attendance rather than short-term stabilization. ED staff train and practice an effective method of stabilizing patients and either admitting them for further intensive care, or sending them back with instructions on follow-up care. This

allows patients to receive immediate care in the ED, but their purpose simply does not lie in extended care. Patients suffering from mental illnesses, particularly those with addiction, require a more invested approach. Typically, these patients present consistently either with untreated health issues, or with a phantom illness manifested through the patient's mental health troubles. As their mental illnesses go untreated, due to either the primary issue being another health problem or the ED's inability to effectively treat mental illnesses, they continue to return to the Emergency Department over and over again. This leads to a distasteful, but accurate term known as "frequent flyers"—patients who show up to the ED daily or sometimes more.

Although current protocol for substance abuse involves both counseling and medically assisted treatment, the initial issue rests in the over-prescription of opioids. Doctors for a time over-prescribed these medications as pain panaceas. Due to the rise of the Opioid Epidemic, implemented standards now mandate an increased difficulty for prescribing opioids. These standards include training in opioid prescription. A population of physicians however, would rather not play with fire at all—a study conducted by Nelson and Perrone in 2012 showed that 13.4% of 259 physicians reported they would no longer prescribe an opioid if they were required to obtain 4 to 8 hours of training and 2 hours of continuing medical education every 2 years in order to be licensed to prescribe. This provides hope that the prescribing of opioids will decrease, but not at rates that remove the need to increase access to proper therapy. The importance rests in finding a mechanism that minimizes additional work, but maximizes directed care.

Patients who suffer from substance abuse tend to be the most difficult cases to properly assess and treat in EDs. In "Trends in Emergency Department Visits, 2006-2014" the situation is summated to the equivalent of a "widespread problem" throughout the nation, regardless of location. These patients sometimes present with secondary outcomes such as needle-stick infections. These comorbidities can effectively be linked to a primary outcome of an opioid addiction, preemptively locating patients of substance abuse (Miller and Polgreen, 2018).

In order to best compensate for this rising demographic, Emergency Department researchers have spent extensive time creating and implementing various organizational strategies to increase efficiency and workflow. In fact, an entire academic landscape surrounding the implementation of organizational frameworks exists. Each framework has its own unique goal designed to increase or reduce various qualities and characteristics of the Emergency Department. However, according to Pearlmutter, wait times before disposition are the best predictor of health outcomes for mentally ill patients, and the Emergency Department as a whole. If these clinics are able to reduce the wait time for mentally ill patients to be medically cleared for transport to a mental health facility, such as a psychiatric hospital, the overall health outcomes of the patients themselves dramatically increases. Furthermore, the decrease in time until disposition allows for a larger number of patients to flow through the Department itself, as beds free up faster.

Standard of Care

As previously introduced, the Opioid Epidemic requires an in-depth understanding of the current standard of care for combating opioid addiction, which involves a combination of counseling and medication (Volkow et al, 2014). In particular, there are three specific medications that create the profile of addiction-fighting drugs—methadone, buprenorphine, and naltrexone. Each medication has a specific purpose when fighting addiction.

Methadone is an opioid agonist, meaning it targets the same receptors as opioids. This mechanism provides an advantage by mitigating opioid cravings through the oral intake of methadone. The drug has few pharmacological flaws, but unfortunately is difficult to access (Volkow et al, 2014). Methadone outpatient clinics must be visited daily to receive a dosage, which in turn inconveniences consistent therapy.

Buprenorphine is a partial agonist, which targets the same receptor, but the patient then receives a diminished response from activation of the receptor with buprenorphine, rather than a full response as with methadone. Buprenorphine can be prescribed by physicians, eliminating the difficulty of daily clinic visits; however, it is not as effective in diminishing craving and withdrawal symptoms. One noticeable danger in the administration of buprenorphine is that brand names such as Subutex carry a degree of abuse liability, although another known brand name, Suboxone, counters this by including naloxone—an antagonist that immediately induces withdrawal if injected directly (Wilkerson et al, 2016). This ensures that patients cannot intravenously consume large quantities of the partial agonist.

The final standard of care drug, known as naltrexone, is an antagonist, signifying that the medication interferes with the reward and analgesic properties of the opioid receptors when blocking them. This allows patients to intravenously or orally ingest the drug in order to break the conditioned stimulus of opioid abuse. As the pleasure stimulus is rendered ineffective, eventually the patient will be able to disassociate the desire for release or reward with opioids. A study even showed that when naloxone was provided to patients suffering from overdose via EMS, their outcomes within the ED increased dramatically (Dworkis, Weiner, Liao, Rabickow, and Goldber, 2018). Vivitrol, one of the newest brand names of this drug family, can even be taken as a single use depot shot, allowing an easy administration of the antagonist. The stimulus may be effectively rendered inert from the usage of opioids, but patients will still unfortunately experience withdrawal symptoms and potential relapse during this period. Thus, this family of medication often has low patient compliance (Volkow et al, 2014). Investigations into these medications from a molecular level have demonstrated that mechanistically, these families of drugs remain the future and gold standard of therapy (Liu et al, 2018).

Triage Checklists

The faster a clinic can transfer their rising and significant mental health population to the proper centers they need to be in, the more time they will consequently have for other patients. An example of a method utilized to decrease wait times for mental health patients is a mental health triage system. Before a patient even sees a hospital bed, the triage nurses and physicians are trained to

effectively assess and diagnose the severity of a patient's condition in comparison to others. However, the triage checklist focuses on more physiological ailments and is limited in its analysis of mental health patients. The creation of a unit-specific mental health triage checklist allows these patients to be effectively categorized, cleared as medically healthy, and prepared for discharge and disposition faster (Broadbent, Jarman, and Berk, 2002). Broadbent, one of the leading researchers in mental health triage, has implemented various studies in Australian Emergency Clinics, with statistically significant results. Of note, the particular triage mechanism used by Broadbent provided a clinical diagnoses needing immediate medical transfer to an intensive care psychiatric facility. It proved effective, and future studies included widening the expanse and inclusive symptomology of the checklist itself (Broadbent, Jarman, and Berk, 2004).

A study conducted by McDonough, Wynaden, Finn, McGowan, Chapman, and Hood in 2004 further supports the predicted impact of mental health triage implementation. This particular investigation noted the reverberations of such implementation throughout the hospital. The team reported decreased wait times overall, increased reported quality of care by all patients, and a decrease in negative clinical health outcomes as a direct consequence of increased average physician time per patient. Another research group conducting triage investigations noted that a key component of the mental health triage system was that it did not specifically isolate a population. Rather it provided a different "lane" for the patients to travel on the highway that is an Emergency Department. The flow of traffic then is allowed to be separate, while the patients themselves are not sequestered into their

own area—minimizing stigmatization or isolation for this vulnerable population (Smart, Pollard, and Walpole, 1999). When understanding the situation for patients suffering from a mental illness, the impact of time spent in the ED for a patient suffering from addiction is clear. The need to refer patients from the ED is apparent, and needs to be a priority of any checklist developed to serve this population.

Opioid Interventions

Access to medications remains an issue, which largely renders their potency and ability to combat the physiological symptoms of addiction ineffective. The National Survey on Drug Abuse and Health states that of the 2.5 million Americans who abused prescription opioids in 2012, less than 1 million of these patients had access to medication-assisted therapy. Volkow and her team attribute this limited access to a few specific factors. First, there is a dearth of trained prescribers of both opioids and addiction-breaking drugs, which prevents patients who seek help from effectively being referred to the proper care. In addition, the public perception of institutions such as methadone clinics and the medications themselves are widely negative due to a misunderstanding of how the drugs biochemically assist in breaking addiction. To further decrease accessibility to proper treatment, few private insurance plans cover naltrexone, and most do not cover methadone (Volkow et al, 2014). The added financial burden combined with social perception and a lack of trained administrators explains why patients suffering from opioid addiction are so far away from effective medication.

As can be seen, the world of the Opioid Epidemic is nuanced; the future of treatments and fighting this epidemic, more so. The interventions presented will involve patients suffering from DoD who have received some form of interventional treatment from 2016 to the present. This was instituted in order to investigate the current standards of care, even if this might narrow the frame away from all possible care methods.

In 2016, physician Dr. Vivek Murthy sent a pocket card to approximately 2.3 million clinicians with a plea to work together to end the rising health crisis of opioid addiction. The pocket card functions as an effective checklist for prescribers of opioids to use in order to prevent mismanagement of these addictive drugs. The checklist allows the prescriber to ask self-evaluating questions on the current situation involved with the patient. It assesses if there are alternatives, suggests the usage of quick-release low dosage opioids, and forces the clinicians at the very least to pause and consider the consequences of prescribing opioid pain analgesics (Murthy, 2016). Murthy now holds the position of Surgeon General of the United States, and continues to press for further awareness of the dangers of prescription opioids.

Another study also supports this path, particularly with the use of fast-release opioids to combat potential addiction (Sproule et al, 2009). There are no reports on the efficacy of the card in terms of health outcomes, but there is content that warrants evaluation. The validity of the pocket card and checklist is supported by the validity of the main influencers of the checklist. In short, a trained physician knowledgeable on opioids created this checklist with influences and data from the

CDC and SAMHSA with intent for fellow administrators to use. The checklist carries a degree of reliability, as it is a highly regulated checklist with a step-by-step process, which supports consistency in treatment and administration. The intuitive formulation of the checklist also suggests a degree of simplicity and potential compliance. The focus on personal, but standardized use of the pocket card in a variety of healthcare settings allows administrators to be flexible in their methodology.

Due to this being a simple pocket card of paper, there is limited cost to the overall intervention. This is a major benefit of the study, and in fact the implementation of this method could save money considering the overall cost of opioid abuse, the potential to reduce addiction rates, and the guaranteed reduction of overall opioid prescriptions in clinical settings. A note of concern in all interventions in this field is that it is important that patients still receive necessary pain relief. This study practices this by the utilization of alternative pain therapies. Furthermore, a reduction rather than elimination of prescriptions is important, as opioids are still the gold standard in specific cases of pain management. If this pocket card continues to be used in a standardized way by clinicians and taught to trainees in the field, sustainability for this intervention can remain high, and in fact this intervention could become the standard of care for prescribing opioids.

A potential issue that may appear in the future when analyzing the results of this study is that the results of proper intervention are long-term health outcomes, which are difficult to capture with high fidelity due to a primary need of compliance from a historically noncompliant and unreliable population over a period of time. In

order to combat this issue, it would require a two-step approach, as most clients would be seen in the ED, where checkups are not the standard protocol. There would need to be a strong referral system in place with accessible primary care physicians who could check up on clinical outcomes after specific periods of time. There are few controversies involved in this study, but the drastic change in opioid prescriptions and the potential of ineffectively treating certain pain could lead to issues. Another point of contention is the fact that the current population suffering from DoD receives no novel treatment as consequence of the intervention, but rather the study focuses on mitigating the growth rate and development of any future populations.

The National Drug Abuse Clinical Trials Network sponsored a Prescription Opioid Addiction Treatment Study (POATS) with the aim of further understanding pharmacologic and psychosocial therapies for opioid addicts. This particular study utilized buprenorphine as the pharmacotherapy, with individual opioid drug counseling serving as the psychotherapy (Weiss and Rao, 2017). There were two legs of the study, with one being the primary four week intervention with two weeks of buprenorphine taper and eight weeks of assessment follow ups. The other leg consisted of an optional twelve-week study with a similar taper and follow up. The aim was for two separate groups, one who underwent purely pharmacotherapy and other who were given a mixed methods approach, to follow through the first study. If they were unsuccessful in breaking their addiction, they were offered an option to participate in the twelve-week intervention.

The overall results were mixed at best, with the 12-week leg of the trial only demonstrating 49% success, and the 4-week rendering a less than 7% success rate without relapse. This is the first large scale interventional treatment study of opioid addiction of its kind, but the methodology of treatment allowed for a high level of validity. As there were two levels of treatment throughout the study, patients were monitored over the course of a long time. This combined with extensive opioid urine tests allowed for certainty in results in terms of breaking the addiction of the patients. The high sample size of 653 patients provides a large enough group for reliable analysis, as the results were statistically significant with significant statistical power as well. This study required the use of a wide number of administrators due to the relatively large sample size and the high level of intervention (clinicians for drug administration, counseling, follow ups, opioid testing, etc.). The cost of this study was undoubtedly high, due to the large national scale it occurred on, the nature of the study, and the cost of personnel, equipment, and treatment. The justification for cost lays in the high fidelity of results drawn from the investigation. The overall goal of the study was to help willing subjects break their opioid addiction through the use of humane pharmacotherapy and supplemental drug counseling for the second subject group.

The current standard of care for all subjects was implemented with the intent of helping all subjects break addiction to opioids. This was further attempted through the use of the second, longer-lasting study for those who failed the initial. Overall, this was a high standard treatment and only served to benefit those who maintained the course of the trial. This study was a high-strain, high-cost, long-term

investigation, which in turn is not sustainable. However, the evidence gleaned from the methodology has sustaining power within the community, as the results are valid and reliable. The new standard of care that could be influenced by the results of this study would thusly have a high sustainability. Although the outcomes being analyzed were easily and reliably measured, the results of the study were not overwhelmingly leaned towards a positive or negative conclusion. This insecurity of results could lead to analytic issues and prevent results from reaching maximum statistical strength. Treatment fidelity has already begun to be ensured by a series of follow up tests, one notably being conducted at the University of Vermont with the intent of replicating the study and further modifying trial periods to maximize results (Weiss and Rao, 2017). There were minimal controversies associated with subjects undergoing the studies. However, the results themselves are controversial in that they show that the current standard of care for treating opioid addiction, including the supplement of drug counseling, is widely ineffective. This combined with the statistics of access to pharmacotherapy leads to a bleak outlook on the current opioid epidemic treatment.

At this point in time in research in this field, larger focusing-studies provide the ability to understand opioid addiction and the variety of therapy inside the Emergency Department. A meta-analysis of these studies conglomerated the conclusions into a clear picture of the future of treatment for DoD in the ED (Hawk and D'onofrio, 2018). The intent is to utilize buprenorphine, refer patients to long-term care, and conduct rapid counseling and therapy before patient disposition. Studies found equivalent results of reduction in illicit drug use after intervention. In

particular, the use of medication assisted therapy with brief counseling and direct referral had the largest effect on long-term outcomes. The validity and reliability of this claim can be solidified with the sheer amount of evidence provided by the meta-analysis—over four randomized clinical trials (RCTs) mentioned came to similar conclusions on ideal therapy. The various RCT's had a variety of financial burdens, with the most expensive trials focusing on medication. However, the meta-analysis simply required the cost of a statistical study.

There was no human intervention in this overview, but all of the studies used for analysis demonstrated high levels of fidelity with the baseline already the standard of care and improvements upon this being the various legs of studies (medication and therapy, intense referral systems, etc.). The amount of evidence was overwhelmingly in favor of interventional methodology in Emergency Departments, suggesting a clinical need for sustaining these practices. The only issues that may have occurred in analysis involved the lack of a standardized statistical evaluation of each method, as this was simply a review of the results of RCTs. A potential usage of a unifying statistic measuring outcomes would have dramatically increased the power of the results of this study. Through this study, one can utilize the various interventions as influences on a future treatment protocol. The only controversies involved the varying study types and the lack of a unifying analysis.

When assessing the current state of the healthcare industry's fight against the Opioid Epidemic, these three examples of interventional studies show how promising the future is. However, there is still work to be done. Within the social sphere, there is a desperate need to reduce the stigma surrounding anti-addiction

medications, and the culture of prescribing opioids needs to change. Even with promising medication-assisted therapies, the results are not quite where they need to be in terms of medication efficacy. This can be attributed to social, pharmacological, and clinical factors that various articles have pointed out. The POATS study ultimately has shown that the nuanced task of treating patients involves both counseling and medication. Dr. Murthy mentions how government funding could go milestones towards providing adequate educational resources for clinicians who prescribe pain medications. This on its own puts a stem on the flood of future victims of opioid addiction. Quality improvement is a constant process that has been helped with the investigations of Emergency Department opioid addiction treatment protocol as well as effective long-term treatments for long-term health outcomes. As the scientific community continues to concrete the foundations and paint in the nuances of the entire picture of the Opioid Epidemic, the daunting issues faced become clearer and more objective. The results suggest that with extra attention from policy makers and government funding, leaps and bounds can be made in preventing and curing opioid addiction—saving thousands and counting.

Autoethnography

As I scribed in the St. Thomas Midtown Emergency Department (ED), I witnessed the impact of Emergency Medical Services on the local population. Specifically, I observed how physicians, nurses, and technicians helped treat patients suffering from mental illnesses and substance abuse. Throughout my undergraduate and graduate studies, I read extensively on the ED being a "gateway"

for these disenfranchised victims of addiction and mental ailments, but seeing events happen in real life provided an unequivocal experience. A statistic mentioned in this paper cites that approximately one in eight patients arrive at the Emergency Department with a mental health issue. Scribing for physicians during night shifts and weekend shifts, I now believe that statistic to be much higher. Even if a patient presented to the ED with a primary issue of an injury or physical ailment, oftentimes it was clear that numerous people needed psychiatric assistance as well.

What I did not expect to find in my time as a scribe were jaded healthcare providers. The mentality of ED nurses and physicians during my time working was best summed up by one of the nurses as a psychiatric patient returned for the second time in the same day "Here they come again." I think on this phrase, and my first instinct leads me to believe such statements are problematic, heartless, and cold. However, I also understood the frustration, hopelessness, and resentment the nurses and physicians felt. How could I expect a nurse to do vitals on the same person 6 times in a week even if there were no physical impairments on the patient? How would I feel if a woman hurled abuse and literal refuse at me whenever I walked into the room? Would I treat that patient with a smile? The world of the Emergency Department and the relationship between the ED and its mental health patients remains complicated, and unless a drastic shift in the treatment of those with substance abuse and/or mental illnesses changes, change won't happen. According to the literature, the Emergency Department specializes in stabilizing patients in order for them to transition to their best method of care. According to my firsthand experience, this remains undoubtedly fact. However, the caveat involves

this specific demographic. An ineffective system of patient referral lets patients with an opioid addiction or other mental illness leave the Emergency Department with no guarantee of their visit to proper healthcare providers. Overcrowding, overworking, and the desensitization of providers to mentally ill patients and addicted patients remove empathy from the ED.

When specifically monitoring the state of patients suffering from opioid addiction, I learned that their true state of dependence often hides behind a veil. I recall one patient presenting with a severe light-sensitive migraine. He told the physician that he often got these migraines and that "I just need Lortab, I know that helps with the pain." Lortab is one of the largest opioids on the market, and the physician immediately told him they would not be providing any form of opioid to him today as part of his pain management. He refused any other pain alternatives. Within two to three minutes of the physician and I walking out, the patient got up and walked out of the Emergency Department with no desire for further treatment.

To my untrained eye, he seemed like a patient with a dire need of pain relief. To my physician, he was just another victim of addiction looking for his fix. When we looked back at his patient record, sure enough he had a long history of opioid use for various pain complaints. This experience completely changed my perspective on the stereotype of a patient suffering from diseases of despair and addiction within the ED. There remained a whole subgroup of patients that I never thought to include in my ongoing triage checklist—those with a different physical presentation, but an underlying desire to receive opioids from the ED itself.

In summary, the most important word to associate with my experiences as a medical scribe is perspective. The perspective of the incredibly determined and hardworking nurses and physicians of Emergency Departments opened me to a struggle many providers feel they have already lost. The opioid epidemic and the lack of proper mental healthcare pathways outside of the Emergency Departments flood the waiting rooms and department beds with patients better treated outside the ED. With the implementation of a targeted protocol such as a triage checklist, these providers can quickly diagnose, assess, and refer patients. This eliminates the tediousness of re-diagnosing a patient every visit to the ED and better finds the patients hiding their addictions behind other ailments. If the cumulative impact results in a decreased disposition time for patients suffering from diseases of despair, the providers themselves can feel the reverberation of such a consequence. I believe that less time practicing inefficient care, more time designated to more patients, and the thought that their work is increasing health outcomes for patients previously thought "hopeless causes" could bring empathy back into the ED.

Conclusions

When placing the piece of the puzzle together, the full picture comes to light. The Opioid Epidemic is here to stay in the United States, and the struggle to treat patients of this Epidemic will continue unless deliberate measures are taken. As this story unfolds, the victims of addiction stand apparent. The National Institute on Drug Abuse reports that one in four patients prescribed an opioid for pain management became addicted. The NDI also reports that in 2017, the mortality rate

rose to 47,800 deaths. Ineffective medications, disorganized healthcare units, and a lack of consensus render our ultimate struggle against this drug thus far inadequate (Nelson et al, 2015). To further the direness of the situation, evidence demonstrates that abusing opioids increases one's chance of diverting to unstable and unregulated drugs such as heroin and fentanyl (Dasgupta et al, 2017). When each of these components are placed next to each other it depicts a concerning image—a population that remains susceptible to addiction, grows in size every year, and exposes itself to further dangers.

The main venue catering to patients suffering from addiction, Emergency Departments provide an opening in which researchers can make an impact. One in eight patients presenting to the Emergency Department presented with a primary complaint of mental health issues (Pearlmutter et al, 2017). Within this population of 17.68 million, a substantial portion of patients come in contact with, or develop an addiction to opioids. Although Emergency Departments currently do not contain the essential arsenal to combat opioid overdosage, addiction, and abuse, the ability to implement interventions within this sector open up opportunities to treat these condition.

A metric or unit of measurement is important order to best quantify and analyze the efficacy of an intervention. Pearlmutter and his associates, a team of scientists dedicated to better treating mental illnesses within Emergency Departments, came to the consensus that wait time until disposition is the most effective unit of measurement in predicting improved health outcomes. Although generalizable to most ailments seen in the Emergency Department, decreasing the

time until disposition drastically improves health outcomes for opioid addiction and diseases of despair, because the faster a patient transitions to long-term and more appropriate care, the faster their opportunity to improve their condition. The reasoning involves the current standard of treatment for patients suffering from diseases of despair. These ailments are best treated in facilities outside of the Emergency Department. Thusly, the quicker a physician can refer a patient and schedule essential visits with proper personnel, the further in-control the situation gets.

An effective method of reducing time until disposition involves faster detection and diagnosis. In order to limit the extra processes involved in doing so, a triage checklist provides an efficient mechanism that fits seamlessly into the workflow of physicians, nurses, and technicians within the Emergency Department. For such a targeted checklist, patient history would be effectively recorded as part of the workflow. Studies show that well recorded and thorough notation of patient history develops into a reliable outcome predictor as the starting point for any readmission steadily pushes further into treatment itself (Barata et al, 2017). Essentially, every time a patient returns to the ED, the physicians can look at their history, and start further ahead than if they did not have access to a detailed patient story. In turn the history speeds up physical evaluations, enhances physician counseling, and maximizes referral resources.

Putting the Puzzle Together

The culmination of the accumulation of this information involves the physical manifestation of a triage checklist for the Emergency Department focused on detecting and diagnosing patients suffering from opioid-centric diseases of despair. An effective checklist will contain the main "pieces of the puzzle" that has been put together using the literature review and autoethnography. In other words, there are certain characteristics previously emphasized that effectively summarize the patient population of opioid addicts interacting with the Emergency Department.

An important component of the triage checklist provides protection against patients presenting as an alternative ailment such as diseases of despair. For example, numerous patients present with a primary complaint of suicidal tendencies, liver failure, and substance overdose. These patients could slip through the cracks of a checklist if not properly assessed on these second level of characteristics (comorbidities to opioid addiction). Another population that can bypass the initial screen is patients seeking opioids within the Emergency Department for their "pain." Opioid addicts may present for a phantom injury or pain to access their needed drug. This can often be detected due to the inability of the patient to create a cohesive patient history or their demand for a specific medication to cure their ailments, like in the case of the patient who "just needed Lortab" for his migraine.

A key population often missed is patients who develop secondary consequences of drug abuse, such as wounds and withdrawal symptoms. An example of an infection patient who suffers from opioid abuse would be an individual with MRSA

infected needle-stick wounds due to injection of opioids with tainted needles—not an uncommon occurrence in the Emergency Department. However, due to the urgency of a MRSA infection, attention is diverted from the long-term opioid addiction and towards the immediate issue. With a quick and efficient triage of the patient's relationship with opioid addiction using the checklist, the patient could then seek long-term care for their addiction after their immediate curing of their infection.

The essential core of a triage checklist such as this one involves understanding the patient population, the subtleties of the primary condition, and how to approach the relationship between these two concepts. The patient population is complex, not easily spotted, and often unmotivated to change habits. Through a synthesis of the literature, however, there are trends that can be gleaned out of this important group of patients. These trends will be further expanded upon, and depicted in the next section.

The Opioid Abuse Triage Checklist

The development of an opioid abuse triage checklist for Emergency Departments requires reflection on the structure and content of such checklist. The considerations when defining the structure included specifications on certain aspects of the checklist. In order to maintain universality with such a diagnostic tool, I wanted to eliminate the need for intensive training in order to best utilize the checklist. Thusly, the checklist simply provides a step-by-step with a simple yes/no response required. The intention of this simplicity revolves around the ability for

any ED healthcare provider to use the tool in their current workflow without any stoppage or interruption. I wanted the mechanism to take seconds to process, rather than minutes.

It was important to also determine where within the Emergency Department the checklist would best be implemented. The two initial locations within the process flow I thought would be either at the actual triage station in the front of the hospital, or at initial triage with EMTs bringing patients into the hospitals. However, this presents its own challenges. If placed at the triage station, the checklist would miss patients with emergency issues brought in via ambulance, such as patients who have attempted to complete suicide, overdosed, or developed other acute issues. If instituted into the EMT plan, this would capture the emergency issues, but miss patients with subtler presentations of Opioid abuse. Even the combination of these two stations of ED remains imperfect. Patients such as the "Lortab" patient cross the triage barrier with presentation as a consistent, acute migraine. It's only once they reach a provider that their insistence on medications indicates a potential opioid addiction. This last piece of information I learned from my experience in the ED set the stage for this checklist to be utilized by ED nurses and physicians in their processing of a patient and their initial consult.

In order to easily create this tool, I developed a suitable acronym with the key characteristics of the target population in mind. The acronym DOSES contains every element discussed throughout this thesis, and best encapsulates the "pieces of the puzzle". As referenced in Table 1, if a patient appears in the ED with symptoms of diseases of despair, they would be checked off as a high-risk individual for opioid

abuse. When overviewing the patient history, if any previous record of substance abuse or an opioid prescription by a healthcare provider appears, these patients would also be tagged.

Next, within their presentation and physical evaluation, if the patient showcases with symptoms adjacent to opioid abuse, such as needle-stick infections or withdrawal symptoms, they are a candidate targeted by the checklist. Finally, the checklist also focuses on patients like the "Lortab" patient I interacted with at the ED—people who insist on a particular medication with a degree of animation.

Table 1: DOSES Checklist

Opioid Abuse Triage Checklist		
D	Diseases of Despair	Patients who appear at the ED either due to liver failure, suicide attempt, or overdose. Important to note history of mental illness.
O	Opioid prescriptions on record	Any history of prescribed opioid medications.
S	Symptoms adjacent to opioid abuse	History of chronic pain, needle stick infections, withdrawal symptoms
E	Excitement and insistence on specific medication(s)	This occurs during the actual patient visit.
S	Substance abuse history	Patient history indicates any history of substance abuse. Exception is tobacco usage.

Finally, once the ED physicians and nurses detect and diagnose patients as potential opioid abusers, the actual intervention and long-term treatment so desperately needed kicks in. In future studies, I believe that a "package" of opioid addiction education information as well as direct referrals to treatment centers

would set the next step of actually treating, and eventually curing, patients. This ability to effectively detect and categorize patients would incentivize this process, as their information could be shared with referral centers for addiction, and an accountability system can begin for each individual.

A commonly used equation within healthcare finance and business is the Healthcare Value Equation. Simply defined as Health Outcomes/Costs, the Value Equation provides a simple evaluation metric with which to judge healthcare interventions such as this triage checklist. I have spent time providing evidence of the clinical implications of such a checklist, but I would like to highlight the financial side of the intervention as well.

The minimization of training cuts a lot of administrative costs that otherwise would be put into a complex checklist. Additionally, there are no expensive tools or equipment that are required for this intervention, cutting costs once again. The integration of the checklist into the normal workflow of the Emergency Department also eliminates the need to higher additional staff to conduct the intervention, once again minimizing additional expenses. Essentially, the only up-front costs of such a checklist would be any papers printed that would contain the checklist on them. Another important source of financial savings involves the long-term cost benefits of curtailing future costly readmissions by opioid addiction patients seeking further treatment. In summary, this intervention specifically provides the rare opportunity in healthcare to combine both an improvement in health outcomes and lower costs. This allows the overall calculated healthcare value to increase with sustainable rates.

Limitations

There were limitations to this project on both structural and content levels. As I am not a trained physician or scientist, my checklist does not carry the same clinical or statistical power as it would have if I carried those credentials and exercised that knowledge. Thus, the triage checklist cannot be used as a diagnostic tool when approaching patients. The use of diseases of despair, as previously stated, could potentially stereotype patients with serious and stigmatized conditions. This in turn could turn the checklist into a segregating tool for patients suffering from addiction and mental illnesses—a currently vulnerable population.

Historically, the precedence of racializing a condition often leads to the improper association of the illness with a specific demographic. Even if the current vulnerable population is seen as the majority, and often the population with the largest social voice, the problem rests in creating a label and placing it on a demographic. This could lead to future clinical implications, influence a shift in the demographic distribution of the condition, and other unforeseen consequences.

There are also limitations set in place for approaching the issue of the Opioid Epidemic as a patient problem. This simply focuses the direction of the project on improving patient outcomes, while missing other viewpoints in this medical crisis. By missing the provider perspective, an important key of the Opioid Epidemic, overprescribing, is not analyzed. There could potentially be other pieces to this puzzle that are missing, because the project simply focused on the patient.

At the end of this checklist, even if it works in effectively transferring patients to proper treatment, the primary issue rests in that there are patients to

begin with. The ultimate problem in the Opioid Epidemic is that people are exposed to, and become addicted to, opioids. Doctors continue to overprescribe this addictive medication, and the rates of addicts and overdoses continue to rise. If actions are not taken to change the culture of opioid usage, and if more effective methods of pain management are not established as protocol, patients will continue to need and take opioids for their pain. Inevitably, patients will then continue to develop addictions to this medication that is killing tens of thousands, will kill hundreds of thousands, and has the potential to continue to spread.

The Future

Research into this field contains the potential to move in a variety of directions. However, a few key specific directions come to my mind when predicting how to maximize outcomes. In order to best complete the checklist and examine its validity, I believe that a statistically significant population of Emergency Department healthcare workers (nurses, physicians, etc.) should be interviewed on the questions placed in the triage checklist. From the pooled answers of this knowledgeable group, I believe a cross-analysis with the conclusions drawn from this paper would render the checklist even more valid based on large-scale data and research along with personal accounts of realities within the Emergency Department. I recently acquired IRB approval to start this process, and plan to continue to interview ED healthcare providers about their thoughts on opioid abuse checklists, and this specific checklist.

A recent development in my research opportunities opens up another measure with which to evaluate my checklist. The Homeless Health Initiative run by Dr. Sheryl Fleisch and Dr. Mary Wood recently commenced an investigation into the data repository carried on Epic, which contains a comprehensive data bank on every homeless person in Nashville who previously sought treatment at Vanderbilt. With this pool of information, I can use my checklist to screen this population for opioid abuse. Using a combination of health records and the checklist, I can determine how effective this checklist is when collecting mass amounts of data on a wide variety of patients. The code is designed to be a simple check for yes or no, in the same vein as the original triage checklist.

Table 2: Coding for DOSES Checklist in Epic

Variable	Detailed Instructions	Response Options
OA_Rx_Hx	1. Search Medication history for any of these known prescription opioids a. Codeine b. Fentanyl (Actiq, Duragesic, Fentora, Abstral, Onsolis) c. Hydrocodone (Hysingla, Zohydro ER) d. Hydrocodone/acetaminophen (Lorcet, Lortab, Norco, Vicodin) e. Hydromorphone (Dilaudid, Exalgo) f. Meperidine (Demerol) g. Morphine (Kadian, MS Contin, Morphabond) h. Oxycodone (OxyContin, Oxaydo) i. Oxycodone and acetaminophen (Percocet, Roxicet)	0 = Negative 1 = Positive
OA_chron_pain	1. Chronic pain a. Snapshot problem list b. Long-term pain: “Leg pain” “Back pain” c. Exclusion: short-term acute incidents/injuries	0 = Negative 1 = Positive

OA_SUD_Hx	1. Substance Use Hx a. Any type of abuse or dependence on the problem list b. Exclude tobacco use c. Search tab: substance listed	0 = Negative 1 = Positive
OA_Sec_Sx	1. Secondary symptoms a. Infection b. Search terms: needle, infection, detox, withdrawal, overdose, MRSA	0 = Negative 1 = Positive
OA_DoD	1. Disease of Despair a. Depression, Anxiety	0 = Negative 1 = Present
OA_Add_Dep	1. Opioid Use Dependence/Addiction→ within the chart	0 = Negative 1 = Present

Once the triage checklist for opioid abuse and addiction has been assessed both at a patient and provider level, the next step would be to implement the tool in various Emergency Departments in high-density patient populations. If shown more effective in a side-by-side comparison with the current standard of care, it would support the hypothesis that triage checklists improve health outcomes for patients suffering from opioid-centric diseases of despair.

Due to the currently immense clinical need for improved methods of care for patients suffering from opioid abuse and addiction, this project's latent impact lays heavy. The simplicity of the process, the ability to objectively measure an outcome (time to disposition), and the intense national desire to see dramatic improvement in the public health's management of this Epidemic lend this checklist immense potential. My passion for this cause and the stated clinical importance of such an intervention lead me to a desire to continue to pursue the validity and efficacy of this checklist in my future academic and clinical endeavors.

References

Abuse, N. I. on D. (2019, January 29). Overdose Death Rates. Retrieved February 19, 2019, from https://www.drugabuse.gov/related-topics/trends-statistics/overdose-death-rates

Addressing Prescription Drug Abuse in the United States. (n.d.), 36.

Analysis | The disease killing white Americans goes way deeper than opioids. (n.d.). Retrieved September 19, 2018, from https://www.washingtonpost.com/news/wonk/wp/2017/03/24/the-disease-killing-white-americans-goes-way-deeper-than-opioids/

Barata, I. A., Shandro, J. R., Montgomery, M., Polansky, R., Sachs, C. J., Duber, H. C., … Macias-Konstantopoulos, W. (2017). Effectiveness of SBIRT for Alcohol Use Disorders in the Emergency Department: A Systematic Review. *The Western Journal of Emergency Medicine*, *18*(6), 1143–1152. https://doi.org/10.5811/westjem.2017.7.34373

Berg, J. M., Malte, C. A., Reger, M. A., & Hawkins, E. J. (2018). Medical Records Flag for Suicide Risk: Predictors and Subsequent Use of Care Among Veterans With Substance Use Disorders. *Psychiatric Services (Washington, D.C.)*, *69*(9), 993–1000. https://doi.org/10.1176/appi.ps.201700545

Bilal, U., & Diez-Roux, A. V. (2018). Troubling Trends in Health Disparities. *The New England Journal of Medicine*, *378*(16), 1557–1558. https://doi.org/10.1056/NEJMc1800328

Broadbent, M., Jarman, H., & Berk, M. (2002). Improving competence in emergency mental health triage. *Accident and Emergency Nursing*, *10*(3), 155–162.

Broadbent, Marc, Jarman, H., & Berk, M. (2004). Emergency department mental health triage scales improve outcomes. *Journal of Evaluation in Clinical Practice*, *10*(1), 57–62.

Case, A., & Deaton, A. (2017). Mortality and Morbidity in the 21st Century. *Brookings Papers on Economic Activity*, *2017*(1), 397–476. https://doi.org/10.1353/eca.2017.0005

CDC. (2016, July 18). Crash Deaths in the US: Where We Stand. Retrieved February 19, 2019, from https://www.cdc.gov/vitalsigns/motor-vehicle-safety/index.html

Compton, W. M., & Volkow, N. D. (2006). Major increases in opioid analgesic abuse in the United States: Concerns and strategies. *Drug and Alcohol Dependence*, *81*(2), 103–107. https://doi.org/10.1016/j.drugalcdep.2005.05.009

Dasgupta, N., Beletsky, L., & Ciccarone, D. (2017). Opioid Crisis: No Easy Fix to Its Social and Economic Determinants. *American Journal of Public Health*, *108*(2), 182–186. https://doi.org/10.2105/AJPH.2017.304187

Deaton, A. C. and S. A. (2017, March 23). Mortality and morbidity in the 21st century. Retrieved February 13, 2019, from https://www.brookings.edu/bpea-articles/mortality-and-morbidity-in-the-21st-century/

Diez Roux, A. V. (2017). Despair as a Cause of Death: More Complex Than It First Appears. *American Journal of Public Health*, *107*(10), 1566–1567. https://doi.org/10.2105/AJPH.2017.304041

Dworkis, D. A., Weiner, S. G., Liao, V. T., Rabickow, D., & Goldberg, S. A. (2018). Geospatial Clustering of Opioid-Related Emergency Medical Services Runs for

Public Deployment of Naloxone. *The Western Journal of Emergency Medicine*, *19*(4), 641–648. https://doi.org/10.5811/westjem.2018.4.37054

Economic Toll of Opioid Crisis in U.S. Exceeded $1 Trillion Since 2001. (2018, September 27). Retrieved February 14, 2019, from https://altarum.org/news/economic-toll-opioid-crisis-us-exceeded-1-trillion-2001

FastStats. (2018, September 11). Retrieved February 19, 2019, from https://www.cdc.gov/nchs/fastats/leading-causes-of-death.htm

Hawk, K., & D'Onofrio, G. (2018). Emergency department screening and interventions for substance use disorders. *Addiction Science & Clinical Practice*, *13*(1), 18. https://doi.org/10.1186/s13722-018-0117-1

Kiang, M. V., Basu, S., Chen, J., & Alexander, M. J. (2019). Assessment of Changes in the Geographical Distribution of Opioid-Related Mortality Across the United States by Opioid Type, 1999-2016. *JAMA Network Open*, *2*(2), e190040. https://doi.org/10.1001/jamanetworkopen.2019.0040

Kolodny, A., Courtwright, D. T., Hwang, C. S., Kreiner, P., Eadie, J. L., Clark, T. W., & Alexander, G. C. (2015). The Prescription Opioid and Heroin Crisis: A Public Health Approach to an Epidemic of Addiction. *Annual Review of Public Health*, *36*(1), 559–574. https://doi.org/10.1146/annurev-publhealth-031914-122957

Liu, L., Wheeler, S. E., Venkataramanan, R., Rymer, J. A., Pizon, A. F., Lynch, M. J., & Tamama, K. (2018). Newly Emerging Drugs of Abuse and Their Detection Methods: An ACLPS Critical Review. *American Journal of Clinical Pathology*,

149(2), 105–116. https://doi.org/10.1093/ajcp/aqx138

Manchikanti, L., Ii, S. H., Fellows, B., Janata, J. W., Pampati, V., Grider, J. S., & Boswell, M. V. (n.d.). Opioid Epidemic in the United States. *Pain Physician*, 30.

McDonough, S., Wynaden, D., Finn, M., McGowan, S., Chapman, R., & Hood, S. (2004). Emergency department mental health triage consultancy service: an evaluation of the first year of the service. *Accident and Emergency Nursing*, *12*(1), 31–38.

Miller, A. C., & Polgreen, P. M. (2018). Many Opportunities to Record, Diagnose, or Treat Injection Drug-related Infections Are Missed: A Population-based Cohort Study of Inpatient and Emergency Department Settings. *Clinical Infectious Diseases: An Official Publication of the Infectious Diseases Society of America*. https://doi.org/10.1093/cid/ciy632

Moe, J., Camargo, C. A., Jelinski, S., Erdelyi, S., Brubacher, J., & Rowe, B. H. (2018). Epidemiologic trends in substance and opioid misuse-related emergency department visits in Alberta: a cross-sectional time-series analysis. *Canadian Journal of Public Health = Revue Canadienne De Sante Publique*, *109*(2), 164–173. https://doi.org/10.17269/s41997-018-0053-6

Murthy, V. H. (2016). Ending the Opioid Epidemic — A Call to Action. *New England Journal of Medicine*, *375*(25), 2413–2415. https://doi.org/10.1056/NEJMp1612578

Nelson, L. S., Juurlink, D. N., & Perrone, J. (2015). Addressing the Opioid Epidemic. *JAMA*, *314*(14), 1453–1454. https://doi.org/10.1001/jama.2015.12397

Nelson, L. S., & Perrone, J. (2012). Curbing the Opioid Epidemic in the United States:

The Risk Evaluation and Mitigation Strategy (REMS). *JAMA*, *308*(5), 457–458. https://doi.org/10.1001/jama.2012.8165

Pearlmutter, M. D., Dwyer, K. H., Burke, L. G., Rathlev, N., Maranda, L., & Volturo, G. (2017). Analysis of Emergency Department Length of Stay for Mental Health Patients at Ten Massachusetts Emergency Departments. *Annals of Emergency Medicine*, *70*(2), 193-202.e16. https://doi.org/10.1016/j.annemergmed.2016.10.005

Research, B. B. D.-B. B. D.-B. is the communications manager for the C. for H. P. for P. C. and O. (n.d.). U.S. opioid deaths jump fourfold in 20 years; epidemic shifts to eastern states. Retrieved March 15, 2019, from http://med.stanford.edu/news/all-news/2019/02/u-s-opioid-deaths-jump-fourfold-in-20-years.html

Rudd, R. A. (2016). Increases in Drug and Opioid-Involved Overdose Deaths — United States, 2010–2015. *MMWR. Morbidity and Mortality Weekly Report*, *65*. https://doi.org/10.15585/mmwr.mm655051e1

Sahota, P. K., Shastry, S., Mukamel, D. B., Murphy, L., Yang, N., Lotfipour, S., & Chakravarthy, B. (2018). Screening emergency department patients for opioid drug use: A qualitative systematic review. *Addictive Behaviors*, *85*, 139–146. https://doi.org/10.1016/j.addbeh.2018.05.022

Smart, D., Pollard, C., & Walpole, B. (1999). Mental health triage in emergency medicine. *The Australian and New Zealand Journal of Psychiatry*, *33*(1), 57–66; discussion 67-69. https://doi.org/10.1046/j.1440-1614.1999.00515.x

Sproule, B., Brands, B., Msw, S. L., & Catz-Biro, L. (n.d.). Changing patterns in opioid

addiction. *Can Fam Physician*, 7.

Stats of the States - Firearm Mortality. (2019, January 10). Retrieved February 19, 2019, from https://www.cdc.gov/nchs/pressroom/sosmap/firearm_mortality/firearm.htm

Stein, E. M., Gennuso, K. P., Ugboaja, D. C., & Remington, P. L. (2017). The Epidemic of Despair Among White Americans: Trends in the Leading Causes of Premature Death, 1999–2015. *American Journal of Public Health*, *107*(10), 1541–1547. https://doi.org/10.2105/AJPH.2017.303941

Trends in Emergency Department Visits, 2006-2014. (n.d.), 20.

Volkow, N. D., Frieden, T. R., Hyde, P. S., & Cha, S. S. (2014). Medication-Assisted Therapies — Tackling the Opioid-Overdose Epidemic. *New England Journal of Medicine*, *370*(22), 2063–2066. https://doi.org/10.1056/NEJMp1402780

Weiss, R. D., & Rao, V. (2017). The Prescription Opioid Addiction Treatment Study: What have we learned. *Drug and Alcohol Dependence*, *173*, S48–S54. https://doi.org/10.1016/j.drugalcdep.2016.12.001

Wilkerson, R. G., Kim, H. K., Windsor, T. A., & Mareiniss, D. P. (2016). The Opioid Epidemic in the United States. *Emergency Medicine Clinics*, *34*(2), e1–e23. https://doi.org/10.1016/j.emc.2015.11.002

Woolf, S. H., Chapman, D. A., Buchanich, J. M., Bobby, K. J., Zimmerman, E. B., & Blackburn, S. M. (2018). Changes in midlife death rates across racial and ethnic groups in the United States: systematic analysis of vital statistics. *BMJ*, *362*, k3096. https://doi.org/10.1136/bmj.k3096