

I'd like to welcome all of you to what I think is a star-studded presentation looking at the life cycle of the substance use disorder patient. Again, I Harold Wain have not nor has my spouse partner any immediate family member have had in the past 12 months expect to have in the upcoming months any finance, but an actual relationship or gifting kind with no industry that is relevant to the subject matter of the presentation. Satisfies that use, of course, are expressed by me and the Army, Air Force, Navy Coast Guard, civil service does not own them, or take responsibility for them.

I am very excited about the panel we have. Every one of them has had extreme experience dealing with these patients, as personally known every one of them personally known their outstanding work with patients, with staff, with colleagues with residents. So further ado, I'm going to go through my slides very rapidly. On substance use disorder, also called a disease that affects a person's brain behavior and leads to an inability to control the use of a legal or illegal drug or medication. Now, we recognize that addiction is a chronic disease that affects reward structure of the brain. It is caused by neuro chemical reactions that are prompted by the introduction of certain substances and behaviors in a person's judgment, person's judgment, physiological independence, and emotional wellbeing are impaired. Just the list of, of substance use disorders, alcohol, cannabis, etc. Most of you know them. So, I'm gonna move on. But acceptance of substance abuse, continuing to use the substance despite knowing that the physical or psychological health of one being is, is tested, using the substance in large amounts over a longer period of time, exhibiting withdrawal symptoms when not using the substance, spending a significant amount of time trying to find this, continuing to use the substance when it causes much interpersonal conflict for oneself.

Stopping or decreasing social work, social work related, or other activities, because of the substances, building up a tolerance, helping a strong urge to use the substance and using and having that strong urge and trying to satisfy by getting that drive reduction, continuing to use even when there is cause the inability to fulfill work, fulfill obligations to fulfill taking care of family, etc. Continuing to use the substance regardless of some of the consequences of causing the drug addiction. High level sports competition. So often if you're doing Sports, medicine, prescription drugs, people come in with pain and then they start abusing them. John stresses, we find that calories are our boss colleagues a difficult, cynical Guess we resort to finding way out of that sense of that trauma, school college problems, when we feel we're failing. We find something that can help us support those endeavors, financial difficulties, poor self-esteem, an ongoing aspect of that self-esteem, loss of a loved one, grieving process, loneliness, depression, failed romances and look at the failed romances. And that goes both ways. How does one handle that? How does one deal with it? And they are looking for that attachment and the attachment becomes towards the substance, low cost and easy access to drugs. Also, the comorbidity of both medical problems and psychiatric issues, contribute to substance abuse. Nice little chart to look at negative emotions. We take the drug to avoid and create a craving. We use the addictive feature to experience a new palette and it starts a new pathway within the brain to give us some sense of satisfaction, but it's a vicious cycle, because we get pleasure. But then there's a negative aspect that starts all over again.

Eviction cycle is pain reaching out temporary leaves, negative consequences and shame. All of these contribute to the maintenance of this undesired behavior. Know the patient finds a very desirable because allows them to escape from themselves. What about the cycle of addiction? It's a vicious cycle that one goes through in terms of rituals, preoccupation, the obsession, the aspect of actually find for that obsessive behavior and look at the triggers that trigger it off to cause the maintenance of eviction,

the cycle of addiction, there are similar to what we talked, look at, look at the various aspects, look at the aspects of looking at the payment goes through the anxiety, the building up of the tolerance, and all the aspects of what contributes to this cycle of addiction. Drug Abuse effects on the brain, we often talk about, because they're a nice chart to look at how it affects the ACC? How does it contribute to the thalamus? How does contribute to the amygdala? What all goes on with the emotional reactions? What does it do to reward structure within the brain? What does it do with looking at dopamine release, these are all things that we want to think about? And recognize that there's a bio psychosocial aspect to it. Look at the negative effects of substance abuse on the entire system. Such just not one part of the brain, or one part of the body that's affected is a continue aspect that each one interacts with one another. And it triggers off a myriad of symptoms, that sometimes we struggle to find the etiology of it. And sometimes what we look at is the unexplained medical symptomatology that occurs because of the substance abuse, mess about drugs.

Overcoming addiction is a simple matter of willpower, horsemen, or anybody who buys into that, me so the abridged very easily. Addiction is a disease is not you can do about it. Not a myth. There are many things you can do about it. Even if they don't want it. addicts have to have to hit rock bottom, before anything can be done. Incorrect. How can I force anyone so in for treatment? Yes, she can. That's though a court ordered the military requires people to get into treatment. And lo and behold, some do buy into it. But as you'll see throughout the presentation today, how do we get somebody hooked in that we changed that structure within that brain? How we formed that alliance is all things we're going to be talking about, how do we have the right medication? How do we have the right treatment, the right support base treatment didn't work before. That doesn't mean you give up just because something failed. Many times, we fumble. And we fumble and we dropped the ball. But we have to learn from that and keep going back. And we keep trying try again. Now what does the term patient mean? And what let's look at why does a drug abuser come in for their suffering. And it's interesting that the Latin word for the Greek word for the derivative a path house is the Latin word for suffering. So being a patient, regardless of what the causes, one is suffering, we have to recognize that the patient is suffering when they come in even if they've abused the drug.

What is it like being a patient, vulnerable, scared, out of control, regress, dependent, helpless, suffering, needy, confused? Well, those are attributed to a patient regardless of the etiology of the disorder. That's a metaphor of illness, loss, a physical or emotional control, amount of control. If I'm in the hospital, I'm in the ER, I'm out of control. Threat to one's narcissistic integrity. I can't handle this myself; I need somebody else to help me. I need an attachment to something to overcome. About one vulnerability, a sense of helplessness, to feel helpless, because Can I really control? I'm dependent? What am I really dependent upon? And depend on my dragon dependent on my medical staff to take care of me. I'm dependent on my counselors will take care of me. Separation anxiety. And my separating from who I am I separate my family. From what I need. I said writing to the drug that I need. That's my family and in certain regards. When I talk about castration anxiety, we're talking about loss of who we are you male or female. Are we do we know who we are? And are we losing by the fact that we're a patient in a hospital when a treatment center from Barcelona substance abuse cause cerebral chaos. Talk to patients even who are not substance abuse, coming who have been given drugs because of the surgery, look into the delirium, they may go through somebody in the ICU, about dementia, a long time down the road anger, but also nations, they delusions that they're dissociating from life from themselves.

They're agitation, the amnesia, the tremors, potential seizures, establish skin irritation, cardiac pulmonary, look at the systems that can be involved based on substance abuse. Denial. Denial can be that fact we're denying aspects we're denying responsibility for things can be a legal term, but it can also be a psychological term, and that we can do it either volitionally or non-maliciously. To deny we actually have a problem. A defense mechanism which is used to keep the existence of unpleasant realities disavowed refers to keeping out of conscious awareness, any aspects of external reality that the acknowledged world would produce anxiety. Very interesting because my favorite river is actually denial, denial. Because many times we can use that to avoid responsibility to put things in bands and wait. Denial consists of refusal to accept a past a present reality, and most commonly is employed to protect the host from their own fun or negative traits, to protect them from repeated memories or negative emotions or feelings to avoid recognizing some of their own liabilities. XR is defined as refusing to accept or believe something, or statement, or contradict someone else's statements. Now why don't we have trouble with the patient may come in is a term that we use in psychiatry and psychology called transference cases, projects onto authority figures, feelings from the past. And when people are treating another individual, they become the authority figure, parental figures. And many times, people have, have had problems with their family, with teachers and school with colleagues with authority figures. And we might say these negative feelings projected onto all of us as we treat these patients. What is the clinician What do you bring to the patient in the evaluation treatment, you bring knowledge, hopefully, understanding, listening skills, empathy, most important hope, and support? And in many ways, you become a GPS system, something they may not have ordered in their car. But you become the GPS system to help them navigate through the life's crises. So, what's going on to help them overcome key things? How do we get them to overcome? How do we get them to be in control of who they are?

Biopsychosocial approach to physical and mental behavior looks at the way both internal and external factors influence our wellbeing stake this model acknowledge that actually, we look at the whole patient. And all of us circumstances when trying to support and understand patients, too often we get caught in the buying of one or the other. But it's the integration of all three, that allows us to get a better understanding of the patient and a better avenue into the patient. Symptoms of cognitive mood and somatic and it's hard to separate one from the other but they're all integrated. And we have to address all of them in order to facilitate overcoming genes, gender hormones, brain chemistry, immune system, your one system, physiological response to stress, but about a psychiatric comorbidity with some of these patients. What about the drugs they've been on? Or about the mental drugs they've been on for whatever disease? What about the psychiatric drugs we've had for that psychiatric disease?

Psychological when I believe ceramics is a personality trait defense mechanism, thought patterns, perceptions, emotion, coping skills, psychological response to stress about the guilt. And important I stress this often the comorbidity of what may be going on bio psychosocial rise from a social perspective. What about your interpersonal relationships? You heard me say earlier about breakup work, sporting events, competition should always contribute to what may be going on. What other social stresses? Do they have access to healthcare? Do they want to use health care? Or they be frightened of the labor? What about finances? What about level of education? What about their risk of violence that they've gone through or has perpetrated? What about any of the violations that they felt, or they violated others? What about legal conditions that may have occurred because of their drug condition? What about the cultural values or traditions? What about the models they've had from their parents, brothers, sisters, family members, all these contribute to the functioning the patient?

Now, none of us have ever seen this. [Indiscernible], the patient's illness, they resist giving up because what they know is more comfortable for them. Basic defense mechanism come to the force in order to protect against unpleasant asset. Now, if you look around and ask yourself, do you like change, and think about the changes you've made and you really like to go through change, think about a patient, knowing they have to change or fearing change, and getting back into that anxiety or that fear that they had the closer to run to them themselves. Getting back to that as a frightening aspect for them, to give something up is a frightening aspect for them. Their defense mechanisms, they have important properties, they, they mitigate the distressing effects of both emotion and cognitive dissonance. They are unconscious, or otherwise stated involuntary, they are discrete from one another.

These are all things that people go through, and then natural to help us. And we've developed these defenses as a way of coping with ourselves. What are some of them regression back to childhood? We dissociate, we pull away from ourselves, we have an altered reality, to motivation. We create things within our body as a defense against anxiety, against the oppression against the loss. We also allow the summarization sometimes to help us regress, because without being taken care of something we may feel that we lost as a child, the oppression we repressed aspects of components. So, it doesn't overwhelm us. And while we talked about, we identify with an aggressor, we identify with others who have hurt us. We've identified with patients we've identified with people of suffering. We intellectualize or rationalize. They say, oh, I'll only do it once. Well, I just made it after this dose after I buy this last time I, after I inject myself, I won't do it. Yes, I know better. I won't do it. We find other ways of rationalizing what we do.

What about personality styles. These are all styles that people use to cope with life. Hoping in a way is dramatic. They're reclusive, they're controlling, self-indulgent, they're avoidant, and they're very manipulative, always personally, styles. Yes, I could label them if they became more than just traits. But people use these as a means of trying to cope with life. Western throw this out. The way we all develop a therapeutic alliance is so significant, because we forget the power of the coalition, the coalition and been dismantled by the patient. This is also classic studies found that the therapeutic alliance is meaningfully correlated with treatment outcomes. And again, I'll repeat that every one of us in this room has been disloyal capacities. You can say placebo, but placebo, has medicinal components to it. But you and you're at therapeutic alliance with a patient, offering the GPS system, morphine, the hope or freedom of the navigation, helping them have the hope that they can overcome is extremely significant. On a transplant, something we have to watch. If I was in the room with you, I'd ask how many of you ever got angry at the patient? Every one of us has gotten angry at the patient. Unfortunately, summers have expressed it. We can set up boundaries, but the idea is to be aware of our biases towards patients, whether it's race, gender, age, etc. Be aware of how we feel. Be aware that this is not facilitated. We have to be aware to neutralize ourselves. And the neutralization may occur by us talking to a colleague talking to ourselves, but there's nothing wrong talking to a colleague and sharing our feelings. And as we get comfortable with ourselves, we're able to find and express these feelings easier. Now this is all something that's right. important to me in my work comes from a psychoanalytic thinking, the working through a process, which is what we need to do with all of our addictive issue, work through the process that causes it and that's maintaining the working true process is not restricted to the attainment of insight not worthwhile by itself. It also includes the acquisition of new psychic structures that are to increase self-cohesion, so as to make habitual defensive and symptomatic behavior less necessary point to starchy 1934.

I know way back in the 1920s. Scotty says change depends on intrapsychic conflict resolution, in response to accurate interpretation of, he says, transference, interpretation. And we are learning along with monitoring, relearning behavior, and monitoring ourselves, monitoring what we do, helping patients manage themselves becomes very significant in terms of helping them change. And as you go through our esteemed colleagues that will come after me, they will be talking about not just the patient, but how the family members and how the system can help patient monitor who they are. mean, in my work, I always need to go beyond the diagnosis, diagnosis, a shorthand version of our ability to communicate from one clinician to another. Does everyone respond the same way? The answer is no. Our method approach is more effective more efficacious for all know, why is noncompliance are readily observed. We need to go beyond the obvious and look beyond look at each patient and recognize what makes them tick and understand who they are as a means of helping them learn new structures, regain control, and make sure we take care of the medical side effects that may have been caused by the addiction. Changing behavior is a surgical procedure. Not easy. I thank you all very much for listening.

And we'll go right into introducing my next esteemed colleague. Next person will be Lieutenant Colonel Shannon Ford, who attended medical school at the University Services University School. She completed her internship residency and fellowship training at Walter Reed. Currently, she is the program director for both the consultation liaison and geriatric psychiatry fellowships and serves as the deputy department chief for the consultant education department in the Directorate for behavioral health at Walter Reed, Dr. Ford.

Good afternoon. Thank you, Dr. Wain, for the introduction. I have nothing to disclose. And the views that I'm going to discuss in this presentation this afternoon are mine alone, and do not reflect any official policy of the Department of the Army, Navy, Air Force Department of Defense for the US government.

These are our objectives for my portion of our symposium. Today, I'm going to reflect on how we discussed patients with substance use disorders. And then how we evaluate and treat them. Regarding the life cycle of the patient with substance use disorders, this is where we're starting. And we'll open with the case. So, our patient today is in active-duty male 23-year-old infantryman who's been having difficulty coming to work on time. His first sergeant had brought him to the emergency department today, because when he finally came into work, he smelled of alcohol. So, you look into his medical record, and you see a past psychiatric history, significant for adjustment disorder with depressed mood after he was seen a few times for work stressors. It also looks like he was lost to follow up after he canceled his last appointment. His behavior health data personal self-reported metrics show a pH Q nine of 12. So moderate depressive symptoms, but he was not suicidal, and he denied any alcohol issues. Because otherwise healthy has been in the military for about four years now on one deployment to Kuwait he returned from about a year ago.

So, alcohol use disorders that presents to the emergency department are not uncommon. The World Health Organization looked at how alcohol use affects utilization of emergency services and estimated potentially half of all ER visits were related to alcohol in some way. And that data is 12 years old now. Globally alcohol use has increased as much as 70% between the US and 17. And emergency department visits increase with 45- to 50-year-old age group having the highest rates. And there used to be a gender gap. But now that is also narrowing, and men and women almost equally are presenting to the ED. Interestingly, military use is actually decreasing overall, with the highest rates seen in men between the

ages of 21 to 25 years old. Typically, junior enlisted army service members in combat specialty operations when compared to their respective counterparts. Despite the overall decrease in military use, between 2010 and 2012, there was an increase that was observed, and it's being attributed to the cost of drug and alcohol use disorders are significant, 3 million deaths worldwide, and almost 14% of jobs of individuals aged 20 to 39 years old are to alcohol. And in 2019 70,000 deaths in the United States for from drug overdoses. Financially, the cost of the United States \$249 billion in 2010, and three quarters of that was related to binge drinking. Hopefully this better. So, from 2006 to 2018, there was a 37% increase in utilization of emergency services. And by 2016, the estimation of over \$400 billion were being spent per year due to substance use disorders. And that's not just hospital costs, but also areas such as crime and lost productivity. And then going back to the military, specifically, in 2018. It costs TRICARE over \$500 million annually, which was an increase from \$425 million in 2006. And then, from the readiness perspective, 17% of alcohol related encounters have associated injuries to cost time away from training and it disrupts units' readiness.

During the past twoish years, during the COVID 19 pandemic, there have been many challenges. The use of emergency departments rows across all mental health diagnoses, and substance use disorders, and there was an increased need of violence risk screenings and prevention intervention. It was reported that for those who already used alcohol or drugs, they use increased significantly, almost 20%. For alcohol, depending on the study looked at six to 8% for cannabis, and estimated as 3% for other drugs, which includes opiate use. 26% of people queried said that there used to increase when they were forced to isolate. So, we talked about the cost analysis associated with the treatment of this patient population, but we didn't look at the non-billable costs. The intoxicated patient can be very time consuming in a chaotic emergency setting, especially if the individual is intrusive, aggressive or violent, or loses control of bodily functions. Family members may be present and in denial about the patient's disease, delaying treatment and disposition. Or the patient may find that the emergency room staff is their only real support system, and they regularly return to the familiar environment for care and support.

A study was conducted by Clark colleagues published in 2015. With the intent of identifying challenges associated with treating this population and emergency room staff attitudes towards these patients. educational interventions were provided with the goal of improving attitudes. And while staff self-report about their knowledge of how to care for these patients improved, there was no statistical difference in attitude change. So, this is generally potentially a frustrating and challenging cohort of patients to care for. The putting aside our biases for or against this patient population. Where do we start with the emergency room evaluation? We start with the HPI initial interview, review symptom, history of substance use intoxication and withdrawal symptoms. If there is a history of complicated withdrawal, the patient's reliability may be specified, and so collateral information is essential, available medical records as well as friends and family.

I've learned a lot from battle buddies and unit members in the emergency room because frequently patients will just start denying everything when they want to leave. from a biological standpoint, a physical exam with appropriate lab studies can be very informative as to where the patient currently is, in need of admission to a medical ward for treatment or observation, or if they're in need of a psychiatric admission. labs can help with a determination of if a patient is in withdrawal or intoxicated. Or if there's another process going on that's presenting similarly to a substance use disorder. Given how these patients can be difficult to work with, it's important to ensure a patient's mental status is not

altered due to reasons other than intoxication or withdrawal. subdural hematomas hypoglycemia, toxic alcohol ingestion like methanol, GI bleed, substance somatic failure, renal failure, etc. Intoxicated patients shouldn't prove as they become more sober, and less knock skated. So, if the patient's mental status remains altered beyond that anticipated timeline, or if there's other reasons to suspect a head injury, such as being brought in by the police after a fight. Head Injury imaging such as a CT scan is definitely appropriate. And poison control can also really be your fun cube, especially in the case of multiple ingestion.

But not every patient who presents the ER requires that full standardized psychiatric medical clearance panel. So, in one hospital, that emergency room, they actually risk stratified. Based on a prediction of whether or not they thought the patient would need critical care resources for complicated withdrawal. And then they otherwise just had a section marked off where patients were monitored until they were essentially sober enough to be discharged home, there were medical resources available. They didn't get like just pushed in the corner. And over all these patients were considered low risk for complicated withdrawal. They sent her off. And over 3000 of these cases, they found that only 1% were mislabeled and required resources beyond observation. And actually, though, within that 1% group, and they went back and looked at it again, they were misidentified because there were abnormal vital signs. That was a commonality and a difference and not 1% compared to the other 99%. So, despite the majority of these patients not requiring significant medical intervention, and I think this is a really good point about how we need to not dismiss any kind of abnormal findings and attributed to a secondary aspect of their substance ingestion withdrawal. Returning to our patients, we are able to gather more information. He is objectively intoxicated with a BA L of 180. And he has mental status changes such as slurring his words and having difficulty standing up straight and walking.

His urine drug screen is still pending the bit tachycardic and you're talking to him, and he threatens to shoot himself if he is given extra duty again, just an off the cuff comment made in the comment of you know what's going on. So, our patients expressing conditional suicidality, but we can't just discharge him back to his unit and tell his commander that they can't give him extra duty or punish him for this habitual tardiness. Is it safe or fair? To ask a man to take responsibility for him in the barracks. Can we let them sober up and then refer them to outpatient care? Do we have other interventions we can use? Do we just ignore what he said because he's intoxicated? It's important to note that patients with alcohol use disorders are less likely to receive a thorough suicide risk screening. So, we need to ensure that these are complete and the patient population as we do have an obligation to ensure they're both medically and psychiatrically safe to go home.

From a safety perspective regarding medical clearance to discharge outpatient care, instead of being hospitalized to monitor for alcohol withdrawal. The prediction of alcohol withdrawal severity scale pot gives us a numerical score that helps predict if someone's going to require medical support for withdrawal symptoms. It looks at patient responses as well as clinical evidence and level of intoxication on a 10-point scale. So, if we apply it for our patient, he's young. No history of non-complicated withdrawal and no current withdrawal symptoms, despite being intoxicated, will presume he's had blackouts in the past. And based on our current knowledge, he only uses alcohol and he's never been in treatment. So, his score would be a three on the recommendation cut off for high risk of moderate severe alcohol withdrawal syndrome.

Using this scale is four He audit alcohol use disorders. Identification tests can be used to quantify youth and identify if the patient is at risk of health problems related to the alcohol abuse, or use. But the patients have to be truthful and recording. If you remember, our patient said he had absolutely no difficulty with alcohol when you're assuming behavioral health. And it doesn't necessarily help us in the emergency department, when we're making that inpatient versus outpatient decision. But the numbers can help us with discussing with the patient and determining what the next steps are going to be. There are other options. So, a quick and easy screening tool that helps us figure out what to do next is that night a quick screen, and it asked about behaviors in the past year. If the patient says No, she's not in the case of our patient, you know, you reinforce abstinence. But as the patient says yes, endorsing one or more days of heavy drinking tobacco use illegal drug use, there are additional resources that you can find to guide your next step. And this is completely available online. I'm not going to go into further details about it. But they talk about how to have the conversation and then what follow up tools are available.

So back to our patient. One finds the doorway and it is obvious that you can smell alcohol, his drug screen comes back positive for cannabinoids and opiates. There's more than just alcohol use going on. Patients getting frustrated. He's been sitting in the emergency room for a little bit. He doesn't think there's anything wrong with him. He wants to just go back to work very focused on not being placed on extra duty again. So, using his best judgment, he punches his battle buddy these patients are really important to recognize quickly service for themselves to staff, other people in the emergency department to other patients. I mean ideally verbal redirection and like gentle elbow nudge gets the patient back into the room, you turn off the lights, you let them be calm, but that's not often easy to do and sedating patients with medications becomes a very viable and often necessary option. There are risks associated with using medication to help manage agitation in the emergency room. Respiratory depression offensive as peon dystonic reactions fall on QT interval is a typical antipsychotic for use.

The seizure threshold is lowered, patients can experience hypotension worsening delirium haloperidol carries its own risks. 110 milligram intramuscular doses use five milligrams, ketamine is growing more popular and maybe preferable to either of the more traditional medication classes. And there is pretty good evidence that it will control symptoms faster. Studies have found that ketamine induces sedation in about five or six minutes, whereas haloperidol can take 13 to 17 minutes, which would make a huge difference in someone who's acutely agitated. But with ketamine, there is actually a real risk of laryngeal spasm. And while intubation is rare in the emergency room setting, it is sometimes required.

And additionally, you have to give subsequent doses of ketamine in upwards of two thirds of these patients. So, it's a risk benefit balance. Regardless of what you choose, obviously, ongoing cardiac monitoring pulse oximetry is recommended. Ultimately, really drugs choice based on personal preference and clinical presentation, especially if there's overdose that is concern. Then if we use medications for agitation or aggression, it kind of changes our discharge planning because going home becomes less viable options. So, we end up hospitalizing, this, this category of patients for further monitoring stabilization. And the other benefit of hospitalization is we get more time, we're not trying to discharge plan it to in the morning, we can call people to coordinate for appointments, we can engage in Intensive Outpatient Programs and really get the ball rolling for ongoing care following discharge. We don't have time for that though, in the emergency room setting because when and it's true in the morning, we can't you know, call IOP in and create an appointment for them. Those patients fall through the cracks, even though we recommend clinically that they follow up with behavioral health and they



follow up with a primary care doctor. And sometimes the patients aren't even agitated, and they just come in, you know, kind of sheepish that this is what happened, and they just want help they recognize it's a problem, especially because they've come into work intoxicated or something. And so, when those are the cases, you know, we really just want to engage them in care and recommend we focus on substance use. less than 11% of this population have had treatment in the past 12 months. So, for him to engage them now while we have their attention in the immersion Since the room, at least shifting that that contemplation stage, so we affect their behavior in a treatment modality and a forward movement modality. We're doing better for them and for the military at large and the population we serve. There are five modalities here, that can be utilized in the emergency room setting to initiate treatment.

Motivational Interviewing is one we often talk about, you know, it can be used to explore more about what's going on with the patient and a treatment modality at the same time, and really help patients resolve some of their ambivalence about what's going on. There are five general principles for motivational interviewing, you express empathy through reflective listening, you work with the patient to identify goals, and the discrepancy between their goals and what they're actually doing. self-efficacy and optimism, and you'll avoid argument and direct confrontation. And then just to the resistance instead of directly opposing it. Anything such as opposing resistance, passing judgment, being direct, confrontational, actually impede change and lead towards distance, which is what we're trying to avoid. We'll go through the others in a little more detail. And then initiating medications is really becoming more common and acceptable, especially agonist treatment with buprenorphine.

So, project assert was a three year grant us in Boston in the early 90s, that you spoke to your counselors and enhanced emergency rooms to engage patients and lasting change with the goal of keeping them out of the emergency room. And so, since 1994, they've offered screening and referral to over 60,000 patients who are treated in the medical center, emergency Senate department for intoxication. The staff are called health promotion advocates, so they're licensed alcohol and drug abuse counselors who consult and collaborate with the emergency room clinicians. And advocacy showed 90% satisfaction with services provided and how the patient's themselves felt they've been treated, and 50% of them made it to their first follow up appointment, which is more than the 11%. Of recently [Indiscernible] interview was developed to help direct and structure these conversations. It starts with directly engaging discussion about the patient's substance use, and then providing feedback about the results of the screening assessment. It leads to a collaborative conversation, asking the patient if they see the connection between their substance use the emergency room visit, with conversation, developing dependent on the patient's level of insight, we see some trends along like motivational interviewing here too. It's encouraged to use facts when discussing what's going on and data that allows the patient to identify themselves on that spectrum of risk. And then if they recognize or once they recognize their substance use is problematic. You start talking to them about their readiness to change using a Likert scale one to 10. And then again, based on where the patient is you change your responses to meet them where they're at. And then you negotiate some goals of treatment, discuss next steps and how that collaborative plan in writing information about what to do and for follow up all with the patient while they're in the emergency room.

And the fourth option of interventions as part Screening, Brief Intervention and Referral to Treatment is a combination of psychosocial intervention and motivational interviewing, validated screening tools that's intended for any medical setting, not just the emergency room. And even it can be used in the

absence of substance use disorders as a chief complaint. So, you could follow up with this if it's identified as an issue in the encounter. It's a brief intervention. If patient centered motivational interviewing techniques are used to help them develop a shared mental image similar to the one previously discussed of what's going on with a patient and develop goals to enact change by participating in treatment. Substance use is not discussed in a binary you're addicted, you're not addicted, you have a disorder, you don't have a disorder kind of manner. It really emphasizes patient centered change instead of that directive conversation. And the goal is to transition to specialty addiction treatment. So, the screening tool is actually a free app available online. It was developed by the Department of Family Medicine at Oregon Health and Science University. Use Google pretty easy to find and it uses multiple screening tools that have all been validated. You know the assists the audit, depression screenings, adolescent screening options, and modified scales that we use for adults regularly to apply them to adolescents. And then there's this flowchart that it's probably really hard to see on the computer. But it shows how these screening tools are connected based on the patient's response. So, the implement is based on the patient's overall score. And then you have recommended actions, the interventions not intended to take more than 15 minutes. And it usually actually can be occurring at the same time as a screening. So, you reduce the goal of reducing intake of substance to less than the recommended amount, unless you're trying to push for complete abstinence, such as pregnancy cases, or liver disease or medical reasons to stop. And then it gives you the option for patients with more negative impacts of substance use in the daily lives or those who are struggling to just cut back or eliminate substance and refer them to specialized treatment.

And the fourth intervention I listed was stir, which is actually a specific emergency room initiating initiated treatment, screening, treatment initiation and referral for substance use disorders, which includes medication initiation if it's determined to be clinically appropriate. So, it was developed after noting that SBIRT have been widely endorsed and utilized but the treatment effects can be better. And the intervention for aspirin is limited to behavioral treatments. And we've just got more options now than when SBIRT was originally developed. And so, stir uses those principles, but it adds to the therapeutic options for intervention, specifically being able to also target tobacco use and opiate addiction. During one study, smokers were engaged in motivational interview referral to the state's smokers quit line, and then a follow up phone call two to three days after enrollment. And then after six weeks of nicotine replacement, either given patches are gone, and the first dose was started in the emergency room. And so, at three months, the group that had been engaged in pharmacotherapy initially had a 12.2% abstinence rate. And the control group that did not get the pharmacotherapy only had a 4.9% abstinence rate. And a smaller study that involved adults with opiate dependence, who presented to the ER for any reason, stratify patients to three arms, community-based addiction treatment referral, traditional Esper intervention was facilitated direct referral, and emergency department-initiated buprenorphine and referral to primary care for 10 more weeks of medical management.

So, there was no difference in rate of negative urine tests amongst the group. But 78% of the group that was started on buprenorphine in the emergency department was still engaged in care at 30 days, and less likely to be enrolled in inpatient services compared to the other two groups. And in comparison, the group that engaged with SBIRT without medication only had 45% retained at 30 days, and just general fruitfulness 37% In days to 30 days. There are some concerns with using buprenorphine in the government says a waiver. And so actually Massachusetts passed a law in 2018. That mandate in most

hospitals and emergency rooms offer pharmacotherapy to treat opioid use disorders. And they published guidelines for how to make this happen to include using telemedicine for support and publishing a three-day protocol that started to detox. We're coordinating for ongoing care in the outpatient setting. So, this is still an investigation that's ongoing and also looking at these amount Trek film for alcohol use disorder. But it is gaining ground and getting data specifically for opiate use disorders as we just see and talk about this more often. You know, there's three treatment options. But the emergency room setting really only buprenorphine is viable because you're trying to manage withdrawal symptoms and initiate engagement and ongoing outpatient agonist therapy. Methadone is specific to a treatment program setting. In the coming in intoxicated, it really isn't possible to initiate an El Tracfone.

So, starting in the emergency department, it does need to be further studied. But when patients initiating buprenorphine in the emergency department are twice as likely to engage in outpatient care when compared to referral alone. There's never any data. This is one of the fears that people would come to the emergency room seeking buprenorphine and agonist treatment, as opposed to seeking it through other substance use programs. And that didn't happen. We did not see an increase in emergency room use just for buprenorphine. And then the Connecticut VA is also published on what they were doing. And apparently 20% of their patients were coming in with opiate use disorder diagnoses. So, they established this process within their psychiatric emergency department where they could keep a patient in there long enough to have them start going through withdrawal symptoms. Initiate the buprenorphine. average length of stay was about 48 hours. And then they were referred to primary behavioral health provider with psychosocial support and given them the locks on rescue kit, as well as enrollment in the weekly buprenorphine clinic. If for whatever reason someone couldn't stay in the emergency room, or they were on a long-acting opiate, and they weren't gonna initiate withdrawal in the next 48 hours or so they also had a daily clinic called their detox and stabilization service. And so, patients could instead of staying in the emergency room get referred to the DAS program, and then be seen daily before transitioning into the weekly buprenorphine clinic.

So, going through those pretty briefly, it's obvious you know, our patients, we've got some options on how to help them. And so, let's go back and talk to him about what his options can be. This is life cycle, have a substance use disorder patient and ours has determined that he would like to learn more about what goes on in the immersed in the ICU. He's not responsive. We're gonna have to call a code and call back psychiatry when he's awake and talking.

And it's not just my great pleasure to introduce our next speaker, kind of just given is a graduate of the United States Military Academy at West Point, as well as to a medical school. She completed her internship and residency in internal medicine and psychiatry, at Walter Reed Army Medical Center. After completing residency, she returned to West Point where she served as a fascist. After completing her work there, she returned to work to read for a critical care medicine fellowship. Since that time, she has worked as an internist that will create a Tripler Army Medical Center. In 2019, she transitioned to the Uniformed Services University, where she serves now as Assistant Dean for Faculty Development, as well as the Walter Reed Medical Center where she serves as Program Director of the critical care medicine fellowship. Aaron's thinks she's deployed as, as all of our panelists, except for two of us to Iraq and Afghanistan, which she served both as a psychiatrist. And as an intensivist. Dr. Bunin, look forward to hearing your talk.

Alright, thanks so much for having me. I'm really excited to be speaking to this multidisciplinary audience. And I'm looking forward to what questions you might have when we all wrap all of this up. But thanks so much for coming. And I look forward to telling you the rest of the story of our patients. I, my wife does not have any conflicts of interest or disclosures, but she's in the FBI, so you better watch yourself. I don't have any disclaimers; these are my opinions and not of the army or the government or DOD or anything of this sort.

Okay, so I'm actually going to jump ahead a couple of months from where Dr. Ford left the case off. So, this patient did indeed require ICU admission, that initial time for his substance use. But now, he made it through that admission, ended up getting discharged, and then ended up representing to the emergency department with a little bit more of an exciting slash concerning presentation this time that I'll tell you a little bit about. My objectives are going to be to talk about why these patients end up coming to the ICU. Talk about how a medical person experiences these patients what we think about what we're comfortable with what we're not comfortable with. And then as it really turns out, I can't let the psychiatry part of me go entirely. So, I will talk a little bit about how I see the family situations and that teachable moment scenario from a little bit of a med psych point of view. So now our patient was found down crouched in a fetal position at 05 in the morning and suspected that he had been that way pretty much all night in that same position, found empty bottles of Risperidone and clonidine and Celexa with him, he was known to have this history of alcohol use and poly substance use.

And now unfortunately, due to the locked position he had been in for an extended amount of time was actually found to have compartment syndrome of his lower extremities. And he was taken from the emergency department to the operating room for bilateral fasciotomy. The sounds excessive and insane for this to happen, but I actually have heard of numerous patients who either from alcohol abuse or from Poly substance abuse ended up Passing out being found on for extended amount of time I've met individuals who have lost arms and legs from this phenomenon. So, this is not the first time you've seen this, but it is certainly a terrifying experience to think that an individual can lose their limbs from their substance use.

So when this individual was, labs were finally done at 0552, he had a lactate of 8.6 makes me pretty nervous as an intensivist, I start getting nervous at about a level of four or five, a bicarb 19, which, for those who don't know me yet is my very favorite lab number of all time, I love looking at my bicarb, but a little bit low here, so certainly has an acidosis probably related to that lactate gives an AF T to Al t ratio of almost four to one at this point. In my experience, I certainly worry about two to one being an alcohol use disorder. But certainly, once I get to three to four to one it is alcohol use until I've proven otherwise. And has a creatine kinase of greater than 20,000. So again, indicative of the amount of muscle breakdown he has having from being locked in a position for the overnight hours. And now has as you can see, rhabdomyolysis resulting you can see both from his GK and from his urinalysis that's red to have large amounts of blood in it from the myoglobin, but only 14 actual red blood cells, I actually don't know how that happened.

And as far as is a UDF, alcohol, aspirins, all of this all negative at this point, which is a sort of a frequent topic of conversation for me in ICU is when I get a negative alcohol level and someone who I suspect is an alcohol user, does that make me more or less worried. And often, it makes me more worried because it means that I've lost some of that time to be acting on their withdrawal symptoms, to preventing DTS, etc. So why does the patient need ICU and care in general? Well, certainly this patient who's coming

straight from the ER still intubated, will need ICU care. But the bottom line is that they don't come for me, they don't come for the job I do for the job that the doctors in the ICU do they come for nursing care, any intervention that needs to be done more frequently than every two hours automatically requires ICU nursing. Any organ system instability, or even potential instability, if we're just concerned, it's going to go that way over time, certainly will encourage us to bring them to the ICU, in this specific patient severely altered mental status as he presented in the emergency room, intubated, out of the O R, this acidosis that we talked about from his lactate and his bicarb. And he certainly is going to need frequent electrolyte monitoring. When we see a CK that high, we often worry about hyperkalemia, or other electrolyte abnormalities going along with that. So, we're going to be keeping a close eye on that. And then for this individual, the toxic ingestion, that's potential for him with all the bottles that were found around him, make us want to monitor them closely, both from a neurologic respiratory and cardiovascular standpoint.

And this is the case that case series that Shannon, Dr. Ford referred to earlier. And I just want to point out again, so it is a small percentage of patients that end up needing ICU care, you can see it's only about 1% that end up coming our way. But bad things happen to these folks. And we'll talk some more about this through some different studies as well. But I wanted to point out these were the risk factors that Dr. Ford mentioned. But the odds ratios I think are sort of fascinating. In the ICU, I often worry about hyperglycemia more than hypoglycemia. hyperglycemia often makes me believe that there might be an infection or something else going on that I need to be looking for. But it was pretty interesting to me that hypoglycemia was actually the highest odds ratio of ending up in the ICU care in the emergency department for alcohol use patients. Well, I suspect that that has something to do with the degree of alcohol use the degree of malnutrition, etc. But certainly, an interesting finding from my perspective. Hypotension not surprising fever, not surprising. hypoxemia not surprising. And then when you think about again, folks who may use excessively, leading to mental status changes, leading to delirium leading to unconscious, not surprising that they may also present with hypothermia. Really relating to their need for ICU care after their emergency room visit. Interestingly, again, so blood alcohol concentration not helpful in knowing where these patients need to go, or what needs to happen to them from here.

Again, this patient, at this point still sedated, he's probably going to need one to one care, just from a safety standpoint, still not really clear what his toxic ingestion may have been. Was it just alcohol that is out of his system by this point? Or is it the combination of his pharmacologic agents or some other substance we have to always assume poly substance overdose until we know otherwise. So, EKG is in these scenarios are my best friend. So, cardio vascularly, I'm always watching my EKGs closely both for QRS widening and Qt prolongation. From a pulmonary perspective, I always worry that folks are going to be on something that is extended release. And so even if their respiratory status seems to have gotten over the peak, or I've given them long enough for what I think they took to have worn off, doesn't mean that they're not going to again, need to have some respiratory support from whether that's opioids or whether that's benzos, or anything else that may decrease their respiratory drive.

This patient, specifically I do worry about GI dysfunction, whether that be pancreatitis, or, or liver dysfunction as a result of any toxic ingestion. heme, we can certainly get coagulopathies from ingestions, as well, I'd at this point, he's had partialities, I definitely don't want him to get infected, I know that that's going to increase his risk of mortality significantly if he does. So, we're going to be watching his moves really closely and probably ending up giving him some prophylactic antibiotics

depending on how much more we learn about his situation. And then again, just keeping a close eye on those.

So overall, an ICU doctor's perspective of a patient who's coming in with substance use disorders, here's how we feel about sort of the overall issues. And I'll talk about each of these individually. We're really good at toxic drunks. We study these a lot, we're tested on these a lot. We know what they look like and we're often pretty comfortable in treating them. But the bottom line for us really to get started is we're gonna stop whatever agent we think it is and get a bunch of fluids on board and try to either dilute it or wash it out completely.

So, I'll talk some more about some toxic rooms that are common for us. We are pretty good at managing alcohol withdrawal. But I gotta tell you that it makes me nervous every single time because I have seen some very unexpected badness on these patients. I'll talk some more about the risks associated there. We try to keep up with drugs of abuse, but unless we've done a toxicology fellowship or are young and in the know who it's really difficult, I find to keep up with drugs of abuse and, and what's common and what everything is going to look like. So, we are always going to appreciate any toxicologist standpoint, any psychiatrist standpoint, but also, as Dr. Ford mentioned, I am such a fan of poison control. If there's anyone in the audience that volunteer for poison control, like thank you, I have never met a group of people so much in my life who truly are passionate about their jobs and have been extraordinarily helpful to me and care of patients. So, thank you for what you do. We are very worried about patient safety; we have no idea how to handle any sort of psychiatric concerns.

From a safety standpoint, we've never been taught how to do a safety evaluation, or anything of the sort. So, help us out there. And then finally, again, for the most part, Dr. Wain talked about our psychosocial formulation. No one in the ICU is going to be spending time doing any psychosocial formulation. So, we'll really need your help for that to help with that. But I do want to discuss a little bit about how we might be looking at these teachable moments that Dr. Ford mentioned, taking advantage of that teachable moment in the EDI and seeing whether that's true or not also in the ICU. To talk to drunks, we see tons of acetaminophen, aspirin and anti-cholinergic overdoses. We see serotonin syndrome a lot now. We don't we don't use as many of the drugs as freely as we did prior but still there are so many different ways in which serotonin may either build up in the system or the drugs may potentiate each other. So, we end up do we do see a lot of this even if patients are not on specifically SSRIs, or antidepressants of any sort. So, we're pretty on the lookout, our antenna really goes up for serotonin syndrome as soon as we see a febrile patient. So, we do think about that a lot. We talk a lot about Neuroleptic Malignant syndrome, we fear it, we worry about it. But I've actually never seen it in my life. So, I think it's a lot less common phenomenon. But that doesn't change the fact that when it does occur, there's a significant mortality. So, we do worry about it. From my perspective, if I think a patient has overdosed on anti-psychotics, or I see them on anti-psychotic, and I'm worried about drug interactions, I, I've done a lot of that, and I will think through it. But I think intensivists in general, are going to think of anti-psychotics as scary drugs, they keep changing, a new one comes out every year, I can't keep up with the side effects of all of them.

And so, help me out here because I don't know what to do. We're pretty comfortable with held all that runs pretty freely, and ICUs at least use a lot of Thorazine for hiccups not really so much anymore. But if we see a patient on psych meds, or uncomfortable stopping them, we're uncomfortable starting them, but we are more uncomfortable keeping them going. So, chances are, if we think a patient may have any

drug interactions, we're pretty, pretty commonly going to stop those. So, from a psychiatric perspective, if there's a reason for us to not do that, please, may be aggressive about letting us know that.

And again, we love poison control. From an alcohol use disorder, alcohol withdrawal perspective. So, alcohol use, it increases your risk for everything else that bad that can happen in an ICU. This was a study that was done in 2014, looking specifically at-risk drinkers, and you can see the labels they use there. So, 14 drinks per week, or four per occasion for men, seven drinks per week or three per occasion for women or for elderly men are sort of the numbers that were used. Using that criterion, a third of ICU patients were at risk drinkers. And I certainly think that we don't, it doesn't cross our mind to be dealing with alcohol withdrawal in up to a third of our patients. And in that third 60% of them are in that heavy use category. So more than five drinks a day, which is really concerning. And these folks have more bacterial infections, more incidents of septic shock, and tend to be on mechanical ventilation for longer than their nondrinking counterparts. And you can see there is the Kaplan Meier survival curve. So based on abstainers or moderate drinkers, compared to at risk drinkers, there is a significant decrease in survivability for these patients. So really important for us to keep it in the forefront of our minds all the time.

And you can see there, our hazard ratio for mortality is 1.83. For our folks who are at risk to train first. It really does affect every organ system; I'm going to go through these one by one to give you an idea of what they might actually look like in the ICU. But all of these that have, you know, increased levels of mortality on their own. Alcohol increases the risk. So, we generally think of sepsis these days as having somewhere 20% ish mortality increase, if we add on the alcohol use all of these others the same. So just to think about this increased incidence and severity and mortality with sepsis. For delirium. Only age and mechanical ventilation are stronger risk factors on alcohol use for development of delirium, likely to have a longer duration of mechanical ventilation use as long as well as a greater likelihood of requiring a tracheotomy, which prolongs everything down the road as well and just longer hospital stay. Certainly, more likely to have seizures, our risk of mortality. If someone does develop delirium tremens is five to 15%. So super concerning aspiration pneumonia are a lot more common in our alcohol use patients. But also, just regular community acquired pneumonia is more common. And alcohol uses a significant risk factor for a fusions and anti EMA. And once our patients develop anti EMA, it really complicates their management. They then can require for long chest tubes, prolonged protocols of using Linux to try to continue to break up some of that. And if we're unable to medically break up their empire EMS may even require cardiovascular surgical intervention. So, it does really complicate pneumonias and complicates their whole hospital course, if indeed they do develop embodiments. In the GI category, none of these are surprising, right? It's not surprising that we're going to have a decreased risk of cirrhosis, or pancreatitis or GI cancers or ulcers related to alcohol use, but again, it increases the risk of all of the other disorders that we may come across in the ICU. Interestingly, 25 to 50% of our trauma patients have a blood positive blood alcohol level when they arrive. appraising number of our burn patients are also legally intoxicated and have a far higher mortality rate if they are indeed intoxicated. And a far greater rate that will have acute respiratory distress syndrome, then our non-risk drinker, not at-risk drinking patients. So, as you can see, pretty much every organ system can be negatively impacted or at higher risk based on alcohol use.

So, our complicating factor for patients like this one who come in and have some other injuries, some other illness, it's really difficult for us to know, are the symptoms due to pain? Are they due to alcohol withdrawal, are they due to sepsis or some other underlying pathology? So, we have to keep this very high on our differential, again, a third of our patients are at risk drinker, so at risk for withdrawal in the ICU.

So often, our treatment efforts are going to be diagnostic. So, if we have a patient who is tachycardic, and we give them a little bit of benzodiazepine, and their type of cardio gets better than that's really going to indicate to us that that may be actually due to the alcohol as opposed to the sepsis for example, heart rates are not going to really improve with benzos. But for sepsis, but will for alcohol use, for example, but we're always going to err on the side of safety and be thinking about this sorting, see what protocols for our patients if necessary. And so are predictors of severe alcohol withdrawal for our ICU populations. So clearly, if they've had complicated withdrawal before, if they have electrolyte abnormalities to include hypokalemia, if they have low platelet counts, again, indicating probably chronic use, probably also some malnutrition that may contribute to that as well. IT and GGT. Also, from a liver function test also correlate with severe alcohol withdrawal. Despite the fact that if women have sort of a lower threshold for the number of drinks, they can have to present with an alcohol use disorder.

Gender and the presence of liver disease are actually not helpful indicators to us, of whether someone will have complicated withdrawal or not. And then management. I don't want to go too far into this because I know Dr. Amin is going to cover a lot of the specifics of actual Alcohol Management. But I will say protocolized care is the way to go. This is very much a team sport. There's lots of options that we can use benzos I happened to be a raise of hand girl, but the raise of hand birthdays pampers Oxazepam no real preference. As far as the studies telling us what might be better. dexmedetomidine is used pretty regularly now as just an agent that can help us with alcohol withdrawal without having to intubate a patient. It actually might. Some studies indicate might actually have a longer length of hospital stay. If we do use the dexmedetomidine instead of benzos. propofol is an option, I'm not going to be treating anyone with propofol without intubating them however, so that is going to sort of up the game. At that level. We are a lot more commonly using barbiturates. Now at Walter Reed at any rate, there's many hospitals in addition to all three that have seen of our protocols for their alcohol withdrawal patients. I personally have not seen significantly better outcomes with barbiturates than with benzos. But more to follow on that and then just like that, the bar has a lot of conflicting evidence with ketamine as far as if it does or does not actually improve outcomes. And I do have some references along the bottom there, if you want to look some more of those up, but I do recommend really just staying on top of it because there's seems to be more of this coming out almost on a daily basis. Alright, so shifting from the alcohol use now over to the drugs of abuse side of the house.

So again, we're not as comfortable with this as, as we are with alcohol, we just see it a lot less particularly in a military population. In this specific study, you can see 11,000 patients and pretty small rates compared to what we were talking about for the alcohol use, right? We were up to 30%. Were at risk drinkers, but only 3% are dependent on heroin or 2%. On cocaine, for example, so far different levels than we were talking about, but many risks that go along with this as well. We're pretty comfortable with treating opioid withdrawal, methamphetamine withdrawal, benzos. And cocaine, we have seen our share of as far as hallucinogens or bath salts, I personally don't have much experience with that. And I don't think many of my non toxicology trained peers do either.



Alright, so next part safety assessments. Again, intensivists are never formally learning how to do safety assessments for substance use patients. So, help us if you think our patient may need a sitter, we don't really understand the difference between a medical sitter versus a behavioral health sitter make some recommendations and do some education for us there. And if you don't think a sitter is necessary at all tell us that too. We're always happy to hear that. And I promise that I'm never going to send a patient home directly from the ICU after a suicide attempt, whether or not it was strictly related to their substance use. So, you don't have to ever ask us to do that, because we never will. All right. And then the final topic that I really want to address this, are we losing a teachable moment by not doing more of addressing this actually, in the ICU, when patients are coming in in such high-risk situation, we don't really know. What we do know, we know that high risk alcohol use is going to increase rates of readmission to the intensive care unit.

So just like this patient that that Shannon talked about required that initial ICU admission after she had her initial interaction in the in the ER, and then again, came back with this stepped-up concern now with a life-threatening condition. So also, we know that the disease severity is often associated with readiness to change. But if we look at a literature review, there's not a lot of great data. Again, like, like Shana mentioned, if we look at tobacco, and alcohol, a lot of the interventions related to medical admissions are helpful with tobacco, and even maybe helpful in trauma patients. So, it looks like if a patient had a big accident, leading to an ICU admission that was related to substance use, then they're likely to drink less, and actually have less injuries in the future if they have an intervention at that point. But with medical patients, it's unclear if this makes a difference or not. So, we don't have any studies at this point that tell us that if a patient comes in with pancreatitis, or if a patient comes in with liver failure, that if we intervene at that point in the ICU environment, that they're going to get better we I can't tell you that that's true. It seems like it would be common sense and could make a difference. But we don't have that data.

And then what's super interesting to me, so again, this is where I haven't quite let go of all of the psych that's been drilled into me over the past 20 years by Dr. Hines. But when I meet families of substance use disorder patients, I often sort of, in my mind, I'm thinking about where do they fit? How can I use the family? How can I take advantage of a teachable moment for family members? And in doing so I've sort of identified four this is this is not literature based. This is not proven or researched in any way, shape or form. This is strictly my perspective on what I've seen, and that families may be very supportive. They may be enablers; they may come into the ICU and create a completely chaotic environment in the ICU or the They may just ghost and sort of be unreachable. For those supportive families, I find that they really benefit and our columns by a continuous flow of data, they like the numbers, they like the information, they'd like knowing exactly the timing of what's going to happen when and who's going to be involved. And so, we try to keep them as engaged as possible. And they may be our biggest ally to helping this person survive in the long term.

We definitely have families that are enablers to the point of I've had family members bring drugs to patients, I've had family members bring alcohol to patients. So, it always seems really shocking when we have a patient who came in with a negative alcohol level, and then ends up having a positive alcohol level somehow in the ICU. But this happens, family members bring them stuff. So, we have to ensure that patient safety is really at the forefront here, that they're not being given things that may either

interact with their medications or or lead them to taking a significant step backwards from the gains we've already made. And we just have to keep assessing their readiness to change as family members in addition to the patient's readiness to change. As far as chaotic family members, trying to provide structure is huge, but also ensuring that you select one family member who is the point of contact, so that you can avoid getting sort of dragged down into family trauma is has been super helpful for me. And behavioral based information like just giving them a very specific time of day when you're going to update them, not letting them sort of take advantage of the nursing staff not letting them take advantage of more junior trainees etc. But they can really create upheaval and, and sometimes even physical conflict in an ICU environment.

And then finally, for the ghosts, I often find that this is really the spouses who are for kids who just can't take anymore. This person who's so significant in their life, watching them hurt themselves time after time. And so, I find that really being persistent and not giving up and trying to reach these patients. Being really patient or with the family members being really patient with their needs. And then really exploring that, you know, they have very good reasons to be keeping a distance from this person who either currently is or historically was a loved one. And being understanding of that and supportive of that is really the key intervention that I think that we can make there. So, once we get the patient through everything we need to do in the ICU, when do we discharge them, we keep it all patients for at least 24 hours after we've excavated them, just to make sure that they don't need re intubation for any reason. They can't be on anything to keep their blood pressure up. They can't require anything at hourly or even to hourly interventions. And then I have to make sure that again, they haven't taken any slow-release medications that may still pose a risk as far as their injections are concerned, or things like acetaminophen, that may just have a prolonged negative effect. So once these criteria are met, then I'm going to send my patients away from the ICU. And I'm going to hand them off to Dr. Rohul Amin, because he is my hero, and I know he's going to fix them.

Thank you very much, Dr. Bunin, you really have not left your psychiatry behind you. But she's going to graduate together with your being and intensivist. So are there any questions or comments that people want to put it in the chat box, but I just want to point out that he didn't talk very strongly about looking at the medical issues as they go into the ICO. I very much appreciated how she stated what she was more comfortable doing in terms of dealing with some of the alcohol problems rather than some of the drug issues, but she talks about the drug issues as well. And the idea of looking at not formulating a total bio psychosocial approach while in the intensive care unit. She's really talking about setting the foundation there for relationship with the patient and their family and using that as a teachable moment. And notice how she also stressed that idea of that handoff, the handoff back to the ward that you just don't discharge the patient because they're ready to leave the ICU, but she talked to her strongly about keeping them 24 hours to make sure they're okay. And then sending them back to the medical unit which doctor? I mean, we'll be talking about it in a moment. Any questions for Dr. Bunin? You can hold off to later we'll try and get our entire team, the last couple of minutes of our session able to interact. And if you have any thoughts or comments, please, please send them.

Now it gives me great pleasure to introduce another colleague, Lieutenant Colonel Rohul Amin, who's also graduated. Presently, he is the program director for the psychiatry residency program at Walter Reed. Prior to this, he served as chief for the Fort Belvoir residential treatment facility. Not sure I mean, is a graduate of the combined psychiatry and internal medicine program here at Walter Reed. And especially interests lie in somatic foam disorders, and Addiction Medicine. Dr. Amin.

Thank you, Dr. Wain. Just to confirm, can everyone hear me, okay? I'm sorry. Yep, I can hear you. Alright. Okay. So, let's keep going here. I don't have anything to disclose in no conflicts of interest. And the usual disclaimer, everything I discussed is going to be my own opinion, I'm going to be talking to you about two different settings. So, we have seen and talked about that clinical vignette showing up to the emergency department ending up in the ICU with significant morbidities, we'll try to use that vignette and move along this continuum. So why bring a patient like this to the ward or other patients that might be similar? Well, so. So, one, issue is withdrawal, we'll talk we'll get more into the withdrawal piece. But we want to make sure that we continue to manage the withdrawal safely. If there are other in organ issues, in the ICU, the patient has acute kidney, kidney injury, or they have other needs, we can continue to do that without the ICU level nursing requirements. And then the other big element of that is assessment by psychiatry consultation liaison in most hospitals in order to determine what happens to the individual as far as their addiction goes.

And so, I see that we have a variety of different specialists in the audience, social workers, pharmacists, psychiatrist, primary care, and we all have really a role in all of this. In so as far as the ward goes, I'm going to talk a lot about withdrawal management, I'm also going to talk about observing for some of the feared complications. And we'll also then go into the RTF. And really spend some time talking about how you figure out who needs to go to level three versus level one and everything in between. And then, the other thing I want to discuss is our diagnostic testing, as well as evidence for some of the biological treatments that we have in this patient population.

So again, this is the two domains that we'll discuss, you can get patients from the community either to the emergency department or outpatient and can jump between any of these different areas on this continuum of care. So, let's talk about complications that you might see in patient with substance use disorder on the medical ward. So let me introduce you to my slides. You can download these, I've put this icon, the Reference icon and say submit to be a very busy slide, but it's also meant to be something that you can look back at and review as a reference. So, and this the only thing I would like to point out is, you know, so with the opioid the withdrawal syndrome can be fairly uncomfortable, but the ones that we care the most About or alcohol and then sedative hypnotics, especially benzodiazepines, where with these syndromes you could potentially die from these or could have significant second morbidities and, and issues. Try to identify these complications in terms of what are the complications of acute intoxication. And so we talked about rhabdomyolysis, which may potentially be due to the patient being comatose prolonged pressure on those muscle groups, possibly from just being intoxicated. And then you have acute withdrawal issues such as one Nicky's encephalopathy, delirium tremens, so on and so forth. And then you can also have chronic complications, the big ones that come to mind is, we talked about course of cost psychosis, but also in organ damage, especially patients ending up with liver cirrhosis.

So, so you can review that and, and look at it and stare at it some more. But let's go ahead and zoom in and spend some time on the alcohol withdrawal. So as you all know that with alcohol, based on its pharmacokinetic pharmacodynamics, we often see usually a predictable course. And we have identified these various windows in which you are at risk for seizures in the 48 hours post. You know, last drink or cessation of alcohol. You can have delirium tremens, usually 96 hours, but can be slightly longer. Similarly, loose nations can be up to a week out. And anxiety, tremor, insomnia, these things can be

longer. As a matter of fact, insomnia can go on for up to three months in patients hear the thing that might kill someone directly, maybe seizures. And then delirium tremens may lead to indirect death, if patients are having Akali psychotic symptoms, you know, behavioral issues where they might act out on something. And then there are obviously a lot of issues with surviving delirious, or psychotic episodes, where, you know, I've seen patients having significant PTSD like syndrome from those, because they do remember those thoughts. So when we approach a patient with that is acutely intoxicated with alcohol? One of the big question is, are they going to be sort of garden variety? Not uncomplicated withdrawal? Or do I need to have greater concerns and as Dr. Ford had alluded to the PAs scale is probably the best tool that we have.

One of the thing with this, just for, you know, for you to know is that this is studied in inpatient population. And so not necessarily upon arrival to the emergency department because as you know, patient populations can be different. So just this know that when you're using it outside inpatient population, you may potentially be impacting the reported sensitivity and specificity on the score of cutoff for is used. And so I think one takeaway that I would emphasize is, understand one that if you haven't heard of this, this exist, and then to use it, and use it because the psychometric properties of this are excellent. So I'll show you those. So let me introduce you to this concept of likelihood ratio. So I know that I gave you the sensitivity and specificity now know that this is from a fixed population, right? What we really want this tool for us to do is to help us predict a future event. And so we can take the sensitivity and specificity. And as a matter of fact, this this hyperlink at the bottom, you can go in and get your get your likelihood ratio calculated. So the higher the positive likelihood ratio, the better and then the lower the negative likelihood ratio. Sure, it's better.

And so let me just guide you through this, because I'm going to show you a couple of this later on this nomogram. So on the left here is our prior probability. So at baseline, we know that about 5% of patients may end up in delirium tremens. So our base, you know, our kind of prior probability is 5%. What happens to our posterior probability, ie, if, if someone is positive on the scale, it actually puts you at close to 85% of posterior probability, which is amazing, right? You go from 5% to 85. So you're categorizing all these high risk patients really nicely. And then the beautiful thing about this also is that your posterior negative likelihood ratio is super, super low. And so your posterior probability is less than point 5%. In so it'll really help you dichotomize your patient population, so that you can focus on folks that you need to worry about. So in this case, the posterior probability is 84%. And then the posterior probability of a negative test is essentially close to 0% 0.2 years. So there.

So it's important to understand that and appreciate that about pause, depending on which way patients end up, most patients are going to be at least in our system, in the being low risk. And so, so based on their risk stratification, you have a couple of options of managing someone withdraw. The idea here is that you want to, you know, target the same receptors that the GABA a receptors that the alcohol targets, right. But we're replacing alcohol with a known entity, benzodiazepine, or we talked about, you know, phenobarbital that she's in the ICU setting. And you have a couple of different ways of doing it. So the common one that you see is so called symptom triggered where you use a scale to scale, you can get points for various withdrawal symptoms, and the more points you have the higher amount of benzodiazepine, you'll get often Lorazepam and then the dose goes up based on how, how much you score on that.

The good thing with that is that patients are more likely to have lower length of stay, and then reduced use of benzodiazepines, so probably fine for that setting, but for patients with high risk, especially if they have history of DTS or withdrawal seizures, a couple of safer options are fixed those so you can load people, or you can put them on a schedule and then these are usually combined with CEUs scale. So again, this is a restroom slide. This would be a front loading regimen with diazepam or chlorthalidone. And you can give as a PAM 20 milligram or once every hour until patients lightly sedated. And for ordering purposes, you can put a score of negative one to negative two. You can the good thing with basic PEMS, you can also do an IV, so 10 milligram there, and then chlorthalidone you can do 50 milligrams. And then the beauty with both of these is when you load patient up out of tapering is what's helping you with that because of the very long half life.

Here's the rest scale. So the idea there is to make them slightly drowsy or lightly sedated. They do not need to be totally, you know, out asleep or they're not responsive to touch for example so don't need to overdo it. In usually people say about five milligram for every standard drink of value, so you could kind of estimate how much of the benzodiazepine, someone's going to need you if you're loading chlorthalidone. So fix those things regimens, so I use it quite a bit with patients who don't want to be admitted for so called detox And you can prescribe them this if they especially if they have some family member or someone in the unit to help them, you can put them on the schedule dose, and over four or five days, they can be successfully weaned off here are some of the former pharmacology of the common benzos. I've given you the conversion.

For these, depending on what source you look at, these can be slightly different. But you can review that the big takeaway from here is that both diazepam and chlorthalidone have really, really long half life of some of their active metabolites. There's some other therapies, I know that Dr. Bunin talked about propofol and alpha blockers and, and barbiturates. Here are some other things that you might see, such as these anti epileptics as well as sympathetic treatments with clonidine and beta blockers. You know, the big thing would be this, his patients should still be on some sort of benzodiazepine, probably, or at least barbiturates.

And the greatest recommendation of these expert recommendations or adjunct treatment and not mono therapy, but you can read the description of all of these in this. So especially if you're one of my trainees in the audience, I highly recommend that you review this practice guidelines and everything you've ever wanted to know about alcohol withdrawal management is in there, one of those acute morbidities from this that we absolutely don't want to miss. So you can, which would be Wernicke-encephalopathy. So often, you know, we talked about the so called triad have patients that have timing deficiency due to their diet and alcohol use. If you did go with sort of the diagnostic criteria, your sensitivity may only be 22%. But you can raise that to 85, you know, close to 100% by using the canes criteria. So there's another thing I want you to kind of take away with you is if you have three of the four, you should just treat the patient with timing 500 Iv 500 milligram tip, there are different recommendations, but most often, people just go for the highest dose. Some other complications of substance use. So we talked about we just focus a lot on alcohol withdrawal, because that's what's you know, associated with death. But you can also have a lot of other morbidities, which would indirectly kill people. So this would be from someone Forgive me, let me turn up this.

This phone, so this would be someone inhaling really, really hot, inhaled, crack. If they're smoking, well, they are smoking it, crack cocaine, they inhale that and then there's sort of direct injury, essentially burn

injuries in the lungs, which leads to a lot of edema. And in patients can go into that pretty distressed distress from this. So this would be one example. I'm just giving you some different things that can happen for the psychiatry residents. You might see this on price or your boards, this would be someone who has a history of cocaine use disorder and they show up with this rash. And so this is often a vasculitis that happens from Liement salt, which is a cutting agent used in a lot of the cocaine supplies that we have. Some patients can have this essentially call it allergic reaction. But they can have this in the big one is going to be they'll always tell you that the patient has this rash on the ear lobe so that's a common buzzword that you'll hear.

This is just showing the vasculitis as you see all the blue is all those inflammatory cells surrounding the blood vessel. I'm not going to go through this, but there's a huge burden of infection related to, you know, substance use disorder, especially if there are needles involved. So you name it, you can get it really the big ones would be, you know, endocarditis, or other bacteremia. And second, that can have significant security, these are the so called train tracks, or skin tracks. So when you're assessing patients, whether it's on the medical ward, or anywhere, if they have substance use disorder, they really need a thorough assessment. This would be an example of someone injecting simpatico medic. So in this case, methamphetamine being injected under the skin, there's very good constructive quality to those sympathomimetics. Cocaine, methamphetamines, and essentially lead to tissue, ischemia in tissue dead.

So you see the black scars, that's just dead skin, and it's just, you know, waiting to get infected and can be pretty bad. So here would be an example of someone getting necrotizing fasciitis. On the left side, here, here's the so called mouth, where you can have, again, this impact the mimetic effects in the mouth can be vasoconstriction, and tissue debt for people's teeth might fall off. But you also have these other dental problems, again, more and more skin findings. So the point of this quote, is, one of our responsibility is make sure we do a good physical exam, when we're seeing patients with any kind of substance use disorder, head to toe exam, and especially evaluating in doing a good term exam. Okay, so I am going to move on to the inpatient residential treatment setting.

The big thing I want you to take away from this, if you haven't worked with patients with substance use disorder before, is that in psychiatry and mental health, we use the biopsychosocial model, there are three domains essentially. And in addiction medicine, essentially expanded into six different domains. Looking at acute intoxication and withdrawal, what sort of biomedical physical complications, they have emotional complications in dimension three, four would be motivation to change, five would be risk of relapse or having other potential challenges. And then dimension six would be what sort of living situation and recovery potential there is. And so the worse you are in the, the higher level of care you're going to need. So let's talk about that a little bit. With these, with these six domains, you can get different scores. And then the higher you score, you may end up on this continuum of care all the way from your here level, you know, one, level three, so on and so forth. But you could have level 0.5, which would be just some basic psycho education. We see this a lot in the army, where someone has some sort of alcohol incident underage drinking. They don't otherwise meet criteria for substance use disorder, but they may end up going through a three hour class, healthy drinking, etc.

Outpatient Services is level one, and then often the residential treatment facility, or you might see RTS is level three, and then you can read on your own all these other different options that we have IOP would be 2.1, and then partial hospitalization, which is essentially more hours during the day. IOP tend to be half a day. And then partial hospitalizations are often an all-day affair. And so how do you determine

whether your patient that you're seeing the medicine wards in your clinic, and they have a substance use disorder? How do you determine whether they are they should remain at level one or if they you need to bump them up? Higher? So, this is again, emphasizing those five, or those six dimensions and how those will help you determine. So, this is a reference chart for the residence in the road, print this out and hang it at your desk. But these are, this is a little crosswalk, and you have these anchor points, and you can score zero to four. And as you see on the left are our four of the domains here. And then the fifth and the sixth one is on this slide here. And you know, the higher you go on this, the worse type of outcomes there are.

And here, as you see there for level three, typically has one, three, or four in dimension one, two, or three, and then an additional three or four and dimension 126. So, it's kind of helping you with that for IOP or partial hospitalizations. You know, what sort of score should you be seeing, and then for Level One, so hopefully, you'll be able to download this and save this somewhere for reference purposes to help you determine. Now one caveat, though, in the military, though, sometimes the consequences can be so severe, that we may have lower acuity patients on the RTA, because for the lack of better word, we're kind of throwing the kitchen sink at them, because if they relapse one more time, they're going to lose their career. So, you might see that we use somewhat of a modified ACM criteria were benefit of the doubt is given to the patient needing higher level of care and lower level of care. So back to this case, so I'm not going to read this. But I'll tell you that when I went through the patient's history, this is actually a real patient of mine. At Fort Lewis, he actually scores here at C two, and other three. And then he scores a three there and zeros in that recovery environment, based on my recollection. So, these are the fours the two, the one. And if we go back to this decision metrics, what you'll see is that the patient probably should be heading to a level three residential treatment facility.

And so how do we diagnose alcohol use disorder, I'm not going to go through those DSM five, obviously has those criteria. In DSM four, it used to be you know, there's I really like the concept of alcohol abuse versus dependence, I thought they were meaningful term. Anyway, we don't have those now, it's a linear diagnostic model, the more criteria you meet, the greater the severity is not weighted. So, one criterion does not weigh more than the other. So, what that means is that you'll end up with a lot of different variations of patients with alcohol use disorders, that may be very different, some may have a lot of so-called dependence type of symptoms with a lot of physiological withdrawal issue and others may not. But that's the history is going to help you determine their diagnostic diagnosis, but physical exam, and some lab tests may also clue you in if you have if you have not been clued into their behavior yet, which may be the case where because there's a lot of stigmata attached in the military, you could actually have implications for your career. And so, a lot of patients would rather not disclose their struggles with alcohol. This is just something called Matt lung disease, also known as benign symmetric language lipomatosis. You know, I think I see one of my residents get a poster on this from one of our patients at the RGF. But you can have these are somewhat more severe you can have patients with more benign so from now on, I would like you to start looking at patient's supraclavicular region and if they have the fat pads on alcohol use disorder should be on the differential. This is just an image imaging showing all this sort of fatty tissue in their neck here.

Okay, so we talk a lot about Right, the so-called soft signs of alcohol, a CL T GGT ETG in urine. Or you could do it in hair MCV macro cytosis how big the red cells are, and then CDT carbohydrate deficient transparent. So, CDT so if CDT is a type of transparent when your body is exposed to alcohol, there is a linear relationship between the amount of alcohol you drink and how much carbohydrate deficient

transferring to transfer and ratio, or what that is. So, the higher it is, the more someone's been drinking, how good are these tests? So, this is one of those reference slides and I have tried to search the literature and come up with sensitivity and specificity. But again, what we really want to know is the likelihood ratios. And so, for that what I've attempted to do is give you sort of the common ones. So GGT ACLs t ratio difference two to one, like Dr. Bunin said three to one is actually more specific four to one and beyond start considering, you know, maybe they have muscle breakdown or rhabdomyolysis that can raise your AC ratio and make it you know, more than four to one or five to one, and then macrocytosis and CDT so how long intake time needed for the test to be positive, or so called abnormal or hit that threshold? Well, you need to be drinking for five weeks for GGT SDLT ratio eight weeks for macrocytosis and 10 days for CDT. So ideally CDT would be better, right, because we want it to turn positive sooner than later. And we're not talking about ATG, which literally would tell you after someone has had something to drink, that they're positive or BL. So, and then detection interval since their last drink. So, once you stop drinking, it takes five weeks for GTT to improve five weeks or eight DLP ratio. So, these two can be grouped together and it's just five weeks. MCV, on the other hand, is eight weeks and then nine weeks to normalize and just remember the half-life, it's about 80 days for red cells to turn over. So, this is consistent with that and then CDT is about good for two weeks. How good are the so you're gonna have to put your microscopic vision on here, what I have done is, is based on some studies, the outpatient psychiatric outpatient practice has a prevalence about 20%. And so, I have assumed a 20% of pre probability or prior probability, right.

And here, what I've done is I've given you what happens to your positive and then negative so if the test is positive, it takes the probability, the GGT take the probability from 20% to run 45%, it's really not a huge jump and then it may take you from 20% to 10%. So again, not a huge jump. The ACL t ratio is similarly dissatisfying. MCV and the MPV data is also civilly dissatisfying. It's about 50%, which is no better than a coin toss. When you combine them in the right context, you may have a better bang for your buck. But if you look at CDT, though, it will your posterior probability goes up to 75%. positive is positive is negative, you know less than 5%. So, I would argue that given that it only takes 10 days that CDT is probably the best test that you can do with some caveat now, now, which setting should you do PDP and again, this is just another way of looking at those tests in a pictorial, okay, so we're going to look at CDT a little bit okay. And one of the things that we always want to know is what's the pretest probability of something?

In other words, how prevalent something is, so the more prevalent something is the least value added of particular tested. So let me let me walk you through this. So, in primary care err, the prevalence is around 10%. of alcohol use disorder. And if you get a positive test, it puts you at like 55% negative test is much, much more helpful, right? So, there might be value there. But what if the prevalence was 20%, then your posterior probability jumps to 75%, it behaves differently. Let me give you an analogy. If you have 100 fish in the barrel, and 10% of them are alcoholic, and you got to spear them, your chances of hitting one of those, you know, 10 of those 100 Fish is much, much easier, then, or much harder than 20%. And so, the greater the prevalence, the better the test behave, but you could hit a certain setting like on a residential treatment facility, the prevalence may be up to 80%. And there you go from 80% to you know, 97%, so it's not a big bang. And then if it's negative, there's still a 40% probability that you may have that so and then for ACL t ratio, and RTF is much better, right. So, it depends on where you're seeing the patient.



The bottom line is, and this is a medium, but probably stick to CDT if you're concerned about alcohol use disorder, reasonable to rule something out in the primary care, and then more reasonable to rule something in or out. And with the 20% prevalence, which is what we see in our outpatient psychiatry practice, probably low value diagnostically on a residential treatment facility, all of these tests, with the exception of motivating your patient, so if they are sky high, the team they're at SDLT ratios off, you can trend those and motivate them in terms of showing them how their body is healing. opiate use disorder, again, physical exam, do a direct logical test, UDS. And obviously we have criteria there, I'm not going to go through these, this is a reference slide in terms of how long something stays positive. But know that a lot of the opioids may or may not be positive, depending on the type of assay you're using. And again, the issue with ordering a lot of these tests is that you're going to be, you're going to more likely to end up with some sort of abnormality, which may or may not be meaningful may or may not be true positive, depending on the type of assay that you use.

So, if you use gas chromatography or mass spec, you probably be able to detect most of these both synthetic and non-synthetic. But if you if you don't use that you may be missing out on some of those. So just know that whatever system you work in know that there are limitations to it. So, what do we do in the RTF, setting the biopsychosocial? So, we offer a patient's medications, I'll show you how effective they are. We do a lot of motivational interviewing, group therapy, individual therapy, and an experiential, so art therapy, art therapy. And then at the social level, these are obviously kind of common things being common in the military, we also heavily engage with leadership. So, this is data from when I was the RTF. Chief. And just to give you a sense of what patients that positively contributed to their health, and some of the things that were highest were actually not me, the psychiatrist. But small group therapy, recreational therapy, individual therapy, they loved individual therapy and art therapy, were some of the big ones in their mind that were most helpful.

And then the staff contribution. So those experiential therapists actually scored the highest, much more fun than some of the things we were doing. And so, this is just you know, observation from one RTF. But if you're in charge of something like this, know that a lot of the experiential stuff is received really well by the patients. Now, treatment of alcohol use disorder. So, you guys No, these are some of the medications that we use. There are other ones as well. The big one is naltrexone, and it can per se. And it can per se associate that with essentially any drinking and reducing that in a naltrexone, oral would-be heavy drinking, so it will reduce the amount and then the number needed to treat is around 12, which is pretty respectful. You can stare at this on your own, I have calculated number needed to treat just so you can get the full understanding of this dice off here and a so called interviews, which will make you sick if you drink on this gift giving it to someone has probably low value, but giving it to patients with someone who is able to observe them totally voluntary, actually pretty good data. Is there a difference between these medications? I can per se or now trek zone, there's not. So go with one of those. I usually go naltrexone because it's once a day. And also, you could transition to the injectable, it can proceed unfortunately that three times a day medication for opioid use disorder. Methadone is superior in a lot of outcomes. But the recommendation is if someone is no longer using it, and they're totally off of it, you want to try now trek zone I am now checks on po doesn't really have a role in it. And then if they fail that you got to be pre nursing. If they fail buprenorphine, you go to methadone. If someone is already using, then you can go with buprenorphine. And if they feel that you can go with methadone, this is an algorithm they can find an FTD as well.

Like I said, methadone has better outcomes, compared to beaker morphine. So, let's see. There's also lately even, you know, mortality benefits shown with methadone. This is just to give you a sense of the psychosocial piece. So, things like family therapy, can have significant outcome benefits with the effect size of point three, five, which is fairly respectable. This is a busy slide, but it's meant to show you all the different interviews deisel fear is a study where they looked at directly observed treatments, and in some cases, ISO film was superior to things like naltrexone. There's something exciting that's on the horizon, in psychiatry, in addiction medicine, and that would be figuring out who should get which of this medication. And so, depending on what sort of polymorphism you have, like I gave you this table here, you may have greater efficacy with one drug compared to another.

So, this brings me back to the last slide. So, when you're dealing with addiction, there's a lot of other comorbidities in my experience. If you dig hard enough, you're going to find another comorbid psychiatric condition. So, focusing on all of those, plus the very few therapies that we have directly targeting addiction. With alcohol use disorder, opiate use disorder, is really the way to go. And with that, I can conclude my portion of the talk. Thanks.

Dr. Hines, I am part of the team here doing this presentation. I have not got anything to disclose. Good news. General Milley just called to let me know the President said I can speak for the United States. So, we're all good on that. Of course, I'm just kidding. But at this point, everyone should know that none of the speakers here speak for the government.

Alright, so at this point in the cycle of substance use disorder patient, he may have failed a few more chances at rehab and been hospitalized a few times. And so, we're going to talk about some off label future potential uses for substitutes, treatments for substance use disorder. And we're going to talk about TMS particularly ketamine and some, some of the other psychedelics that are out there. So, I would say in the D AI vein that all the stuff we're talking about is off label. And it is much, it would only be available to people who either have their own means or have very good insurance, or who are lucky enough to get into a research study. So not widely available, we're going to start talking about TMS, or transcranial magnetic stimulation.

And we'll start by looking historically, we often talk about TMS as being chair. Okay, so I'm not moving the slide, somebody else moving the slide. Alright, so we will talk about some historical chairs that give us a kind of opportunity to look at some mistakes that were made in the past, in a reminder that our understanding of the brain is relatively infantile. And so, while we might look at some of these ideas, and think of them as being quite silly, people 20 to 50 years from now we'll look at what we were saying about the brain and and think we're just as silly. So, the first chair we're going to talk about is the tranquilizer chair. Dr. Benjamin Ross, who's considered the father of American psychiatry, thought that it would be a good idea to keep people who are manic in the perpendicular states, so as to keep the impetus of the blood away from their brain as much as possible. He also believes a few interesting things, terror acts powerfully upon the body through the medium of the mind, and should not be employed in the cure, or should be employed in the cure of madness. Fear accompanied with pain, and the sense of shame has sometimes cured the disease.

So, we often talk about stigma in behavioral health. And think of it as not necessarily coming from anywhere, but I think we as behavioral health professionals do have to own that. There are definitely reasons why people have some stigma against behavioral health, including the fact that you can be locked in a chair for 23 hours, and be significantly sensory deprived while you were in the chair. So, if

you have a tranquilizer chair, then you also for sure have to have the opposite, which back in the day was called the Gyrator. So basically, they would put people either in this box in America, or the French version actually did include a real chair, that that basically someone would spin the crank and you would spin, much like the rides at the amusement park. And doing that was supposed to activate people. And you can imagine that they did have some activation, because if you get spun around in this long enough, you'll probably come out of there feeling fairly activated, and trying to get away pretty desperately. So that brings us back to the TMS chair, which is also not that new. In fact, back in the day, as far back as 1908. The first patent was filed. In 1910, there was an article talking about alternating magnetic fields. This particular chair had two large magnetic current producers.

But unfortunately, back in this period of time, these were wrapped in wax paper and often got caught on fire. And they tended to put out significant levels of radiation and so we need a little bit more time and a little bit more technology to get to where we where we are now. And so, several years passed or several decades passed. And the first modern TMS machine was invented in 1985. It uses a figure of eight coil similar to an MRI magnet. The first randomized trials in 1987. In America, the FDA approved TMS in 2008 for treatment resistant depression, they got additional approvals for migraine and OCD in 2013. And in terms of technology improvement, the first data burst TMS machine was developed in 2018 and approved for use or it was developed, approved for use in 2018. And so, in a short 100 years, we came a long way in terms of working with TMS and the technology is going to continue to improve and as it does, so I think it'll become even more useful to us. So, I think it's important to remember that the brain is really an electrochemical organ. And pretty much everything we do, every drug that we apply is essentially either trying to cause the neurons to fire or to keep them from firing. And also, important to note that TMS is very focal, it goes to the area that we want it to. So unlike drugs, which basically are sent to every cell in the body, TMS is less likely to cause systemic side effects.

Alright, so basically, how it works is it uses an MRI magnet, and we pulse it at 10 hertz per second, for depression, which is considered rapid TMS. And we use lower pulses. If we want to treat anxiety off label, you basically get 40 seconds or four seconds, 40 pulses over four seconds, and then you have a 26 second period of rest. And you repeat that until you've gotten 3000 pulses, which takes about 30 to 45 minutes, you can actually turn down the inter train interval as people become more tolerant of it and shorten that time. And now with a diverse TMS, we can actually do a full treatment in three to six minutes. And so that actually makes it much more user friendly, also increases your throughput. And it also opens the opportunity to actually do multiple sessions in a day. And there's some new data that that's going to be helpful as well. So typical treatment course is 20 to 30 sessions. So, on a normal old school TMS, you would do five daily sessions, five days a week for six weeks, excuse me, you do a daily session five days a week for six weeks, to complete a full course of 30 sessions. And now, there are several programs that are either more than twice a day, or even up to 10 times a day, in the latest seat trial that was done out at Stanford, using TBS monitor, excuse me, database TMS 10 times a day for a week. This is just a cool imaging study that basically showed that even though the TMS coil is posted, right here, and the pulse actually only penetrates about three centimeters.

So just this first area of highlight, you'll see that you actually get activation of brain sections throughout the entire frontal simulate circuit in the brain. As many of you know, we're now talking more about brain circuitry and circuits as opposed to individual areas of the brain, we used to talk about the nucleus [Indiscernible] as a standalone player center that was largely responsible for addictive potential in people. Whereas we now know that's just part of a larger salience network that involves multiple parts

of the brain. Same thing with depression, although we've long thought of the limbic system as being primarily responsible for mood. We now know that much of depression is generated through the interior scene, excuse me, the dorsolateral prefrontal cortex, anterior cingulate and then down into the limbic system. Alright, so does TMS work.

This is actually the original study that was done on for TMS by Neurostar, which was the first, excuse me, Neuro Medics Neurostar machine was the first machine that actually got approval. There are now four approved devices in the United States, and two approved theta burst devices. But as you can see, very quickly separated from placebo or Sham, and stayed that way through the course of treatment. If you look at the actual preponderance of evidence, there's two large, randomized control style trials. In addition to the first one I mentioned, there's the OP TMS study, which was a non-industry, NIH sponsored study. So, it was kind of free of industry bias, but it had very similar results to the study I showed you. And then there was a prospective study using multiple sites that were inside and outside of academia. And so, you can think of it as a more naturalistic real-world study that also showed significant and similar results. And overall, you can say about one in two patients will respond and one in three patients will get remission. And while those numbers don't sound great, you have to remember that these are treatment resistant depression patients. And so, in the studies, the average number of failed trials of treatment was around four or four and a half prior to getting enrolled in one of these studies.

And so, if you think about our whole group of patients who go into their primary care doc, and they get put on Zoloft, and they do fine, they never actually even get to see a psychiatrist. All of those guys were weeded out prior to the studies. And so, these were the more difficult to treat. Another important thing that was kind of proven with this is that it's tolerable 80% of patients completed the treatment. And if we could keep 80% of our patients on their medications, that would be a big feat. Alright, so we're going to change gears that was a little bit on TMS. And then we'll pull everything together at the end in terms of addiction. But that's the basics of TMS.

And now we're going to talk a little bit about ketamine and psychedelics. Ketamine was actually approved, or first kind of looked at in the 1960s. Jeff Watkins and his colleagues introduced MDMA in 1980s, we kind of figured out there's the AMPA and the Glee receptor. There's actually more now I think, but these are ones of interest. Particularly the AMPA receptor is important for neuroplasticity, which I think will be important to us down the road. In the 1990s, they started looking at the MDA MDMA receptor and its role in depression.

The first controlled trial of ketamine was in 2000, so more than 20 years ago, and in 2010, multiple groups started using what they call sub anesthetic doses most often, it's a half milligram per kilogram. And they were working out various dosing regimens and what works the best when they say sub anesthetic doses, that means that the patients are not anesthetized, they don't fall asleep or pass out, typically, although there are some issues with dissociation. And patients have to be monitored for at least a couple of hours after they get a treatment. Whether that's IV or the newest ketamine, which was the s ketamine nasal spray that was approved in 2019 for refractory depression. All right, so does it work? There are a number of studies, most of them are not large, but all of them have fairly similar results. Moreau did a study that had two a two-site parallel arm randomized controlled trial of a single dose of ketamine and show that the monitor score in the active group was about seven, almost eight points lower than in the ketamine group. Ketamine is time, excuse me, medazepam group medazepam is actually used as an active comparator or an active placebo because obviously, when you're getting

ketamine, you know you're getting something. So, giving them saline would be significantly different than getting ketamine. And so, if you in order to have an actual trial, you need to use something that shows has some effects on the way you feel.

You'll see in some other studies that basically may use sometimes they use B vitamins because they tend to cause some flushing, and other active comparator is rather than just a true placebo. And the result for the results were pretty resounding, 64% response rates. Same thing, this is another study looking at 18 subjects in a crossover study. And you can see that very early on. There was a significant treatment difference in the ketamine group. And this kind of points out one of the knocks on ketamine, which is that as you proceed, it's not very durable and so the effects tend to wane and so they do need multiple treatments and continued treatment over the course of time. But you can see that using a validated scale treatment was significantly different than placebo. Alright, so that was ketamine. Psilocybin is another treatment that's been looked at for depression. There's a couple of different studies.

Probably the most interesting one in the United States is the cancer study that they did at NYU, where they gave people point three milligrams per kilogram of ketamine versus 250 milligrams of niacin, as I mentioned before, nice and causes some flushing, so you feel like you're getting something, but it was different than the ketamine and the ketamine was significantly better than the than the niacin. Here's an actual study looking at whether psilocybin is better than our standard of treatment. So, they use selects, or Lexapro versus psilocybin, or you either got psilocybin and a placebo, or you got Lexapro and a placebo. And there was no difference between the groups. As you can see, there was slightly higher non statistically higher improvement in the psilocybin group. But it definitely shows non inferiority to our standard treatments, and so can be added to our armamentarium of treatments for depression. Alright, so that was kind of a quick run through some alternative alternatives to standard of care treatment for depression. Now we're going to show a little bit about what there is in addictions. So alright, so at TMS, this is an interesting study, where they actually put what's called a thermo that basically, it's like a little heater, they put it on your arm, and then they ask you to push the button whenever it's too hot.

And that's a way of basically determining pain tolerance. And when they did this with people, 24 healthy volunteers, either real TMS or sham TMS. The people with the real TMS were significant. Sorry about that. The people who got real TMS, were able to, I'm sorry, I don't have the last piece of that slide. But basically, people who got active TMS versus sham TMS were significantly more likely to have more pain tolerance than the group should not. And then this is a study basically looking at Naloxone treatment prior to TMS, which is really interesting to me. Because if you look at people who got Naloxone, so as we know or for those who don't know, Naloxone basically blocks opiate receptors. It's the reversal agent used for opiate overdose. And when people got Naloxone prior to TMS, they basically had no change in their pain tolerance, whereas people who got saline prior to TMS did improve their pain tolerance statistically significantly. So, reason I find that really interesting is because that kind of shows us that TMS is actively working on the new opioid receptor. And although I don't know exactly how it's doing something clinical in the brain. Alright, so for addictions.

There was a review of meta-analysis in 2014. Looking at TMS and addictions, they found nine studies 19 human studies, five of which were RTCs. And in those two had positive reductions in smoking, one had a decrease in cocaine use, and a positive that it's likely modulate neural activity and brain circuits that mediate the cognitive processes related to addiction, such as response inhibition, collective attention

and reactivity to drug cues. There's an interesting study from Israel, looking at smoking cessation, where while they were giving someone TMS, they actually had a person come into the room with a tray with tobacco and rolling papers and they very sort of slowly rolled up some cigarettes and put them in their mouth they didn't like though I don't think but basically trying to stimulate the area, their brain for addiction to tobacco, and that also had positive results in terms of abstinence from smoking. So, the type of this time they the conclusion was promising, but experimental. there actually have been since 2014, several more studies, looking at addiction and alcohol. And I think fairly soon addictions, we'll get a TMS indication.

It's kind of a race right now to decide whether it's going to be anxiety, PTSD, or whether it will be addiction that gets the next indication for TMS. Alright, just a quick thing, one of our texts back when I was at Eisenhower, that needed a project, because she was trying to get into the army Social Work program. And so, we looked at a number of patients who were getting TMS while they were in our RTF. And we actually gave them a modified version of TMS where they got twice a day, so that they could finish their full course prior to leaving the RTS, because a lot of our patients came from distance. And compare those two people who just got the RTF treatment and looked at whether or not the TMS actually gave an improvement to the addicts in our in our program over just the RTF program. And while the numbers were not statistically significant, there was a benefit, a trend towards benefit in TMS. And we had at one point thought we would add a few more patients into this group, because I think it was just a power issue to show a difference. But she got into her program and went on to greater things. And so, we never did the rest of that study.

Alright, so here's a little slide on what we kind of know about psychedelics and addictions. There was a Russian study from the 90s, that looked at a review of 1000 patients who had gotten ketamine psychotherapy. So, they get the therapy while they're under the influence of ketamine, or directly after being under the influence Academy, and may show that more. They had a total abstinence for more than one year and 60% of the patients in the ketamine group versus 24 in the control group. The research coming out of Russia, in the 90s was considered a little bit suspect. I think that right now, there's actually a group in England whose kind of replicating this study, and we'll see what the data holds. But at least from their report, it was very positive. In 2015, there was a study looking at two doses of psilocybin in combination with 12 weeks of outpatient psychosocial treatment and motivational enhancement therapy. And it shows that abstinence increased significantly following psilocybin administration, and the gains were kept out to 36 weeks. So that's pretty good abstinence.

Comparatively interesting, I would just note that this Thomas study was done in Canadian First Nations people, some indigenous people, and may not be generalizable because indigenous people have a culture kind of steeped in shamanism and ceremonies that include dry walking and other cultural things that are a little considered a little less suspect, and they are in non-Indigenous culture. So, so but at least in the group that was treated with four days of group counseling plus two experts led Ayahuasca ceremonies, there was a statistically significant improvement in helpfulness, empowerment, mindfulness and quality of life in the people who were in the Ayahuasca group versus the in the aisle in this group. So, they also showed that there was a statistically significant reduction in problematic cocaine use. And then psilocybin assisted therapy for smoking and nicotine use also produced abstinence rates that were significantly exceeded those four currently available cessation treatments. Alright, that's the end of what I have to say.

Hopefully, people got a little something out of that, and we'll see where things go in the next 10 years or so, related to the various alternate treatments. I did want to mention, I guess I kind of sped past it but all of these treatments obviously, have some issues with FDA approval. Ketamine is you know, one of the date rape drugs and is probably never going to be useful as a treatment, that you would just give people their ketamine. have them take it home and use it for that reason. And then, of course, as we all know, psilocybin, magic mushrooms, MDMA or ecstasy, they all have been ketamine. They all have various street potential. And so, it's a little bit hard to even do the research. But once we have the data, it'll have to be well controlled. If we do start using it more, more, more than we are now. Thank you.

Hi, and thank you very much. For an outstanding presentation. I said this couple of minutes ago thinking I was talking to the audience, he presented new areas of concentration, new areas of interest for people, both from a pharmacological perspective as well as from the electoral perspective, the TMS, we know that TMS has gained a great deal of credibility with regards to treating depression. There are many places you haven't really want to read. You all are doing it on the PCLs. We're doing as an outpatient as well. But again, you presented alternative approaches, which is nice for people to generate hypotheses to think about and recognize this whole issue of looking at complex patient hasn't stopped. We're always looking for new innovative approaches, to be able to research to be able to facilitate positive outcomes for a patient, looking at ways we can help them grow and overcome. I'm going to reintroduce your Dr. Hines I did not do that earlier. I thought I did. But I kept on announcing it, but I guess no one heard me. Dr. Hines is board certified by the American Board of Psychiatry and Neurology. And as the distinguished fellow of the American Psychiatric Association. Dr. Hines has served as an active-duty officer and civilian psychiatrist, Dr. Hines's transition to walk three psychiatry concept liaison service in 2019 been a great addition to the service. Dr. Hines has research interests in interventional psychiatry, brain stimulation, suicide, and the microbe biome. He wants us to know he is happily married for greater than 30 years. His three adult children and recently became a proud grandparent. So, thank you very much, Dr. Hines for your contribution for your presentation. And hopefully we'll all generate some thinking about it and have some questions for you down the road.

Our next speaker is my great pleasure to introduce Dr. Enoch Barrios, who trained originally as an anesthesiologist and in Mexico before he migrated to the United States, while after migrating to United States, he trained as a psychiatrist at Lincoln Hospital Medical Center in the Bronx, New York. He also completed a geriatric psychiatry fellowship at Columbia University with direct exposure and training AECT as part of his fellowship. Since he's been employed at Walter Reed, he has been interested in interventional psychiatry, and has been directly involved in the service and the training of residents of AECT as well as fellows in geriatric psychiatry, while working in the psychiatry concept liaison service, Dr. Barrios.

Thank you for the introduction, Dr. Wain, and thank you for inviting me to this to be part of this workshop with this wonderful group of speakers. We'll try to be as brief as possible given the time and be respectful of the audience that has been participating. So, at this point, had nothing to disclaim and my views are whatever we discuss about SUD is my personal view.

So, use the ACT in the comorbid as the patient so we want to recognize the prevalence of mental comorbidity, mainly depression and anxiety and its impact on individuals with a diagnosis of FTD. Also want to list the care and alternative strategies for managing or management of commodities of mental illness. So, what happens when patients go through All the cycle and eventually become solvers, some of

them and the without a coping mechanism of their anxiety or the depression. And sometimes, if they were self-medicating, eventually they start paying attention or realizing that there is an untreated depression. And, of course, we think about the initial case that not for this cost. With a patient in the next room, the last thing that we're going to be thinking at the moment is, oh, I need to refer this patient to his team, for some reason, and the last speaker on this workshop, but I want to remind the audience that mental illness is very pervasive.

And we're talking about 44 point 7 million Americans suffering from mental illness according to the SAMSA, or substance abuse and mental health service administration. And there's another group of importance for us, which is 19 to 21 million winks. Besides adults, also adolescents, that's offer of substance use disorder. And when we intersect these two groups, window with 8.2 million possible cases of patients with substance use disorder mental illness. So that's a big group. And unfortunately, many of these patients did not receive treatments of yours for mental illness, 50% of the patient's received treatment. For substance use disorder, only one out of five patients actually received treatment. So, this is, again, the group 8.2 million in orange, we put the two groups together. So, I'm not gonna go into all the clinical decisions since Dr. Amin already talked about it. But, of course, we want to size that for patients with comorbidity of substance use disorder and mental illness. Many of these patients are referred to specialized dual diagnosis services. And once that they are stabilized. They continue with some sort of a maintenance treatment. And for the patients that receive all the possibilities of therapists for the Substance Abuse and for the depression, anxiety, and they're still reporting symptoms of depression, that ad is not responding to medications. These are the very selective group that ended up being referred for the alternative treatments, including TMS get them in, and most recently psychedelic drugs, and of course, ECP.

How frequently we receive patients with a dual diagnosis for ACT, I will say that is very infrequent. So, but is as important to this cause the possibility of ACT when patients are not responding to the conventional treatments for depression. What is ACT. So, stands for electroconvulsive therapies is a safe and effective treatment for safe second psychiatric conditions. And the most common indications of course, you have patients with systems using solid that might have also unipolar mania, depression or bipolar depression either in the depressive side or in the manic side. Other indications of course, patients with the viewers as I say dualities of your site costings or malnutrition, secondary to the physicalness patients also with schizoaffective disorder in the process, or psychotic or manic stage, and less frequently, we use ECG for schizophrenia things is not really that effective. On this. The patient has severe side effects or complications from treatment for the schizophrenia. We ended up having some of these patients referred for a CT, which is also very uncommon.

All indications will be Neuroleptic Malignant syndrome that is almost a primary indication for a CT patient with chronic pain that's epilepticus anti NMDA encephalitis, and delirium. What happens when they AECT apathy or to avoid making mistakes, we actually go through a checking list of things that we need to do when we are going to provide ECP to our patients. And the checking list is at least 17 points long. So, and for any procedure is important that even though we don't have the list, at the moment that we're doing the city, we have developed a I will say muscle memory about it. So once the patient is in the ICT suite, we do a timeout just to be sure that we have the correct patient indicating the name of the patient, they the weird type of procedure, and also with this cost within the surely is calling the plan of care. And we'll review when medications, we're going to use the amount of the medication that we're going to use. So, we at that point, have the patient already connected to EK e log press pressure pulse



oximeter, and also an ankle calf and an optical motion sensor. So, then the anesthesiologist proceeds to administer prophylactic medications through the IV which is usually medication for nausea and for headaches. And once that that is done then the patient starts to be oxygenated with a mask. Patients rarely intubated for his procedure. And once the patient is properly of CNA is the unnecessarily administer the anesthetic agent, which normally is meant to exit out here in United States. Once that the patient is properly sedated.

We initiate the coffeemaker inflicting the cough that is attached to the ankle of the patient. And once that we are sure that the patient is sedated properly, we at that point, or actually the natural is at that point administered the muscle relaxant. So, the muscle relaxant that we normally use is a polarizing agent like succinylcholine, which is, I will say most of the times the medication that we use for paralyzing the patient. And now the patient has a potential for rhabdomyolysis, like the case of our patient is if because medications or because catatonia that patient having been moving and we are suspecting that the patient may have muscle destruction. We write prefer not to use succinylcholine but a depolarizing. A live raw Quran is simply a nondepolarizing paralyzing agent live rocuronium just to avoid the possibility of producing hyperkalemia and raising the mind of endorser points and if so, and these are some of the things that is the cause or the time of doing the timeouts within a physiologist. And frequently, even before we discuss it without necessarily then it surely is already identifying the potential for hyperkalemia. And they are the ones that suggests the use of raw Curonian instead of succinylcholine.

But it's important for the provider to be aware that for some reason dematerialize means that that we keep that in mind. So, then we observe the patient for the action of the muscle relaxant. And when we realize a patient is fully paralyzed, then we insert it by block to protect the teeth and the tongue. So, to minimize any possible complications. And then we test the impedance of our device, which basically we either have a green light or yellow or red light So if we think the Enlightened means we are making the appropriate contact to the liver, the electrical charge. And at that point we administered the stimulus. Once the patient has the seizure, and then we remove the by block, and quickly check the oral cavity and resume oxygenation. So, when we removed the by block, we want to ensure that us by blocks are specially designed for a CT. And if there's any little blob in it, of course, we want to check that there is no laceration in the tank or any problem with the lips of the patient. So, at that point, also, we're evaluating the quality of this issue. Not only the compulsive and the, but also the duration of the epileptic activity.

So, and there is no United States, there is no way that we're going to induce a seizure without monitoring the electricity follow around, because patient can still have an epileptic activity without compulsion and want to be sure that the patient is not hiring is that epilepticus without compulsion. So, once they were assured that they seizure and we also Deflate the cuff, verify that decision was completed and document the medications that were used. The stimulus parameters and vital signs, ones that the patient is maintaining bioscience without increased blood pressure or tachycardia that point out and the patient is breathing on their own, and the pearlitic A in this effect disappear, we transferred the patient to the recovery room. And then pitching getting reconnected to be monitored for blood pressure, pulse, oximeter, and EKG. So, this is how the patient looks, they actually have a gown. And the supervisor records the duration of the epileptic activity and the compulsive part of this issue with the optical motion sensor. So those ECP work. So, in the fencer who we are talking to, but it is 11 Live vaccines, currently with a pandemic. So, there are so many misconceptions about it. And the

majority of the patients that receive visiting community hospitals are people, well-educated and usually people that have insurance or have access to the services.

Unfortunately, they still never live that easy to mean use as a well, way of punishing dissenters or punishing patients for some reason. Others at work. So, they theories about it. And there are hundreds, at least 100 theories. And but we don't believe that there is one that explained one single theory that explains how it works. But definitely we do believe that. The other hand, what we see when we are treating patients is some effect at the synapse level, even though as Dr. Hines was mentioning, so we don't think that is just one single type of urines but probably his secrets in our brain and the change of secretary. So, we will live that date and increase in neurotransmitters in that synapse and also not only that, we increase the neurotransmitters, but also an increase in the number of synapses that patients are depressed may not be may not be having. So, this is the neurofilaments theory is unexplained. It's based on evidence that the electricity sensitizes the postsynaptic serotonin receptors and also that AC T kind of prevents the reabsorption of dopamine and norepinephrine. So, and that allows this neurotransmitter stable in the synapse, living like the SSRIs.

And besides these neurotransmitters also there is an increasing production of GABA and OGRA relation of NMDA receptors. So, production and trophic factor in case the synaptic connectivity, and that's what they call it, the density might be seen up to gigantic, and that leads to a rapid onset and long-term antidepressant effect. So, also, there are some studies that say that patients that receive AC T, they have more delta waves in the end after they have been receiving a CT. And also, we know that as we start giving our doing the ECD for our patients, the seizure threshold increases, so the Rain becomes more resistant to cease, possibly due to the production of GABA. And also, this is lowering of the abnormality of overactive rent secrets. Here, there's also neuron doctrine theory, that causes they have Parliament's to release hormones that change the chemistry of the entire body, temporarily opposite the blood brain barrier. And this is something that we know happens, but we will live now, that is more like a side effect that actually mechanism with how the city works. Because we can actually control the blood barrier by decreasing the blood pressure during the CT and preventing for the blood, blood brain barrier to open, but still is it will be effective.

There's another silly theory that maybe we actually don't get the patients better, we just call them to be brain damage, like zombies. And they're not even aware that they are depressed, and they just think that they're better. And there are theories that maybe isn't the patient wants to be punished. The providers provide that for them. And that's where they get better, or because the patients realize that everybody's paying attention to them, and that's where they get better. But those are all really theories that we know they're not accurate. They have installed he's actually doing champ are they called chance dollies that the patient is gone there, Anastasia, but they don't get the electrical stimulus compared with the patients that do. And we know for sure that the patients that we are better than ones that receive the electrical stimulation. And they have been several of the studies. Those 80 have interest. And the answer is yes, like any medical procedure, and could be a very simple side effects like nausea, headache, or more severe like a heart rate, heart rate problem, and up to even dying from AZT. So are there side effects in elderly would have to process if they are not properly paralyzed, they might have fractures, I will put a by block patient might have dental injuries and injuries. But I mentioned headache, nausea, my idea that that's something that we premedicate the patients don't mind that. And I mentioned their aspiration pneumonia and MPP e which is negative pressure pulmonary edema that that has to do more

with the fact that the airways are being manipulated more than with ACP per se, and the mortality will live between two to four 100,000 cases. Indications for ZT there is no absolute contraindication.

But of course, we want to identify and treat any medical conditions associated with adverse events like the anchor case that we were discussing. That is acutely ill that is the surgery for the rhabdomyolysis does not the patient that we're going to start doing a CT patients with pneumonia, elderly patients with atrial fibrillation and coronary artery indices, there are too many things, hypertension, of course, some of these patients one way or the other browser, who will refer them for a medical consult to optimize their health status before we consider them for easy to do a complete, HMP and case review. And of course, we want to be sure that these patients are re connected with a psychiatrist. Because I don't think they will be a good idea for anybody to come knock in our door, say, oh, I want a CT. And who is going to manage these patients, once they are so like, so when are we sure that they are already connected to a psychiatrist, we have to obtain informed consent. And when we say informed consent means that we already sat with the patient explain the procedure and alternatives. And we gave the patients a brochure. And we prefer that they don't make a decision in that visit. They think about that before they say yes. And before we even scale them. There are things that we do during the visit. But I think we're going to stop at this moment. And there is a lot of information, I've already been up to date that most of us have access to it through our library. I will return to the domain. Around

Thank you very much Dr. Barrios for a very informative presentation AECT. It's a follow up to Dr. Ford's talks about his intensive work with it, as she did, and depressive patients this morning using ECC V. I want to thank all of you for listening. But just some of you also have the aspect of going from the ER to the ICU. So, the med unit, and then looking at the alternative treatments, listen to all the presenters, they all had a caring sense of looking into patient, knowing what to do with the patient. And they all offered hope, with finding an effective treatment modality not just for the patient, but for the family as well.

Notice that talks about the safety of the patient, it talks about also dealing with the agitated patient once you deal with it. And in particular, they also talked about forming that alliance with that patient, but also recognizing the medical complications that occur prior and post use of substances. They also have all referred and inferred that you need to understand the pathology of the patient. It also very strongly talked about indirectly but very clearly, some of famous internist, Dr. Oslo's comments about the good physician or the good clinician, treat the disease. But the outstanding position treats the patient. So, it's understanding the patient who they are developing that alliance with that, but also responding with support for them. responding with support and empathy for the person and for the family. Take into account that who they are their character structure, their strengths, their defenses, recognize how we may respond negatively how they may respond to us. And we want to help them find a safe place.

There's an acronym that I use, called heap. So, I just want to share with you what I think we all do, we offer hope. We offer empathy, we acknowledge their assets, and make them aware of their assets. We also pig stands for provide, provide support, provide navigation with their GPS system to help them overcome as they traverse the conflicts within themselves. The reason they ran from themselves, and the goal is to get them back to who they are. One of our other presenters this morning talked very strongly about something I personally am interested in as well, the default network. The default network in the brain says when the brain is not active, the default network comes in. So how do we get

the patient to focus on that default, away from the default and more on something to get the brain active so that it can help in dealing with a substance use disorder.

Any last minute questions? Anything? Anything from our wonderful presenters, I thank you all for an outstanding day of learning outstanding they're presenting. Thank you for the time the effort you put into the presentation, may open it up to my colleagues, any last-minute comments from any of our presenters, Dr. Ford, Dr. Bunin, Dr. Hines, Dr. Barrios?

Thank you very much for paying attention. If there are any questions or comments, please send us a note. I've seen some something in the note that this is very informative. What is the is the acronym again? Hey, thank you for the day full of valuable information. Thank you very much the information. Thank you all for paying attention. Thank you all for being here. And all of you have a safe drive home. Have a good evening.