Good morning. Welcome, everybody. Thank you for joining us I am, Dr. Shannon Ford. With me I have Dr. Adam Bumgardner, Dr. Chelsea Younghans, and Dr. Meghan Quinn. I'm excited to be here this morning to discuss pain, depression and anxiety. Housekeeping notes, I do not nor do any of my colleagues have any disclosures to report. The views we are going to discuss are ours alone and do not reflect the official policy of the Department of Army Navy Air Force, Department of Defense, or the U.S. government.

I also want to talk that off-label use of medications are definitely going to be used in this presentation. This is the topics we will cover today.

We are going to start by discussing how chronic pain overlaps with psychiatric illness; how to create Biopsychosocial Formulation for this patient population and thought about how to talk with our patients who have these issues of overlapping pain and mental illness. We'll take one 15-minute break then come back to discuss what to do, some treatment options, and then talk about some case studies where we put this all together and hope that it makes sense going forward. We'll have plenty time for questions and discussions at the end of feel free to put questions in the chat box as we go along.

Learning Objectives today: Understand how psychiatric illness and pain symptoms overlap; improve ability level of comfort in discussing topics with patients and improve understanding of the psychopharmacologic and nonpharmacologic treatment options available to treat your patients.

I'm going to open with a briefcase. This is 48-year-old woman with history of hypertension, unspecified anxiety disorder, who had a car accident a year ago. She recently moved to the area, and this is the first time you are meeting her. The Chief complaint is chronic, shooting pain down her left arm. She has already tried physical therapy and it helped but she does doesn't have the time to keep going back. She is using her friend's Oxycodone and that has helped. She also notices she has recurrent neck spasms. She is very concerned about managing her pain and overall health while also being a parent. This is leading to pretty good case of insomnia. Her prescribed medications are Amlodipine and Acetaminophen. Her past medical physical psychiatric history is really only significant for hypertension and anxiety disorder. She is a Single parent with two children working two jobs. She is smoking a pack a day. She wants to quit but has not been able too. She really doesn't have any social support system. On exam she has relatively normal vital signs. Her blood pressure is a little high. On Physical Exam there is positive Spurling's sign's reproduction of pain, otherwise motor skills are normal. What do we do? How do we approach this patient? How do we develop the understanding that is going to get us the solutions and the treatment effect that are safe and effective? I am going to turn this over to Dr. Younghans for the next session.

Hello, good morning. My name is, Chelsea Younghans. I am a resident at Walter Reed. I'm taking on the empty task of addressing the intersection of chronic pain and psychiatric focuses. When we look at quantifying what the problem truly is, we're looking at about 75 to 100 million adults in

the United States that are suffering from some sort of chronic pain. The most common ones we see are chronic low back pain and headaches. We see also we look at the demographics of it that women are going to be more likely to report chronic pain, that it's going to increase with age.

We're going to see higher incident and lower household income. And then persons with mental illness to are also going to have an increase of reporting some sort of chronic pain. We spend on average about $560 billion to $635 billion per year treating chronic pain. This is higher than the combination of heart disease, diabetes and cancer combined. For the first time since 1979 the international Association for the study of pain introduced a new revised definition of it. It's the result of a tender process. This will lead how we assess pain, how we talk about pain, and the verbiage we use. The main key guide of definition that they have: An unpleasant sensory and emotional experience associated with, were resembling that associated with, actual or potential tissue damage, and there are six key notes that we use to continue to clarify or talk about it. The pain is always a personal experience. It is influenced by varying degrees by biological, psychological, and social factors. Pain and no inception ere two different phenomena. You cannot actually infer pain based solely on the activity that we see in sensory neurons.

Through life experiences, individuals are going to learn about and conceptualize pain very differently. A person's report of an experience of pain should always be respected. All the pain usually serves as an adaptive role, it tends to [Indiscernible] and as adverse effects on our function, social and psychological well-being. A verbal description is only one of several behaviors to express pain. Just because somebody has an inability to communicate that does not negate the possibility that they are experiencing pain.

Only acute pain has a role. It warns of danger and [Indiscernible] biological functioning -- paying can be considered chronic when it persists for more than one month after the tissue should be held, or if it's been present for at least three of the previous six months. Well, we look at the acute pain pathways, and this is going to be an introductory role to what are the pieces of the puzzle that can be dysfunctional or contribute to where we see the intersection of pain and psychiatric illness. When there is some sort of acute pain, trauma, and injury, peripheral nerve injury receptors first sensory neurons are activated, and they are going to be activated by [Indiscernible - low audio]. They sent signal up to the neurons in the particular track they go up is the [Indiscernible] track then end up in the brain. What they end up there, there is projection [Indiscernible] that reach out to the [Indiscernible] activating system and the Hypothalamus.

These are the key parts that are important for unpleasant emotional components that we have with pain. In addition to these regions that are activated by this input, is also a descending pathway that is going to head back down. It's going to try to facilitate or inhibit pain based on kind of all of the other feedback we are getting sensory, cognitive, [Indiscernible], all of the other things that are happening. This connects the dorsal to the spinal cord via [Indiscernible] which are going to receive all of the input from the [Indiscernible]. Those

particular areas are the record tax, the [Indiscernible - low audio] and [Indiscernible - low audio]. There isn't a single chronic pain State where evidence of peripheral nociceptive damage can predict who will experience pain or the severity of the pain.

The right of pain quantification does vary significantly based on the type of pay. The leading hypothesis that we have to go with to explain this is both peripheral and central nervous system are going to play some sort of role in determining what leads to the perception of pain. Many individuals that have significant input into that acute sensory pathway will not experience pain and others within a large identified without any identifiable input is going to experience severe pain. Pain acts as a stressor that in the long term can produce dysfunction, space in the hypothalamus pituitary adrenal axis. This has been associated to chronic pain, chronic distress, and a lot of other factors. One way we can maybe conceptualize this is there is an increased influence the forebrain centers exert and some sort of descending pain-facilitatory brain STEM nuclei.

This is a proposed mechanism to explain the [Indiscernible] Association between chronic psychosocial factors, and whether this theory facilitates end up regulates or impairs our ability to inhibit the pain coming in. [Indiscernible] process and interest -- enter there's functional and structural reorganization of the neuronal circuits in the Central Nervous System. With multiple imaging studies taken from the activity of pain pathways are altered by intentional State, positive emotions, negative emotions, and among many other factors that are actually related to the pain stimulus itself. There are now numerous studies that demonstrate the patients with chronic pain have alterations in brain regions that are involved in cognitive and emotional processing of pain. The longer the pain continues, the more the brain is altered. One of the critical regions where we see kind of this alteration ability to change with pace don't pain is anterior cingulate cortex this is involved in the processing of both pain and mood-related information. We see that hyperactivity of this area can be recognized in depressed patients.

In recruitment of this area has been established in pain processing. There was a study that showed the Depressive-like symptoms in a patient actually persisted three weeks to six weeks after they stopped inducing any sort of pain. The Prolonged emotional consequences point out the presence of long-term plastic changes completely secondary in sort of peripheral nerve injury. Brain imaging of patients with chronic low back pain showed an exaggerated and abnormal amygdala connectivity.

In addition to the ACC, we also have studies that consistently indicate the prefrontal cortex neuron also undergo some sort of long-term plastic changes when we have chronic pain. Repeated pain has been shown to actually reduce [Indiscernible] methylation of PFC as well as amygdala. Some of these changes are actually correlated with behavioral increases in pain. Unlike the ACC, the prefrontal cortex plays a really important role in cognition and decision-making.

In addition to possibly asking to decrease our perception of the pain. Some of these plastic changes in the PFC in chronic pain conditions may

actually contribute to [Indiscernible] reported in people that have long-term [Indiscernible]. Maladaptive pain coping behaviors and co-occurring psychiatric illnesses are two of the strongest based on predictors of chronic pain. The level of depressive symptoms does not actually influence or is responsible for coding the sensory intensity of pain. Depressed individuals who display greater activations in brain regions known to be responsible for effects of our cognitive processing of the pain like the amygdala and insula.

The presence of catastrophizing was associated with increased neuronal activations in the sensory coding regions. These regions are important for attention to pain, emotions, and motor activity. Pay catastrophizing itself may account for up to 40% of variation in producing the development of chronic pain after some sort of acute pain episode. It's good to know the light at the end of the tunnel is these plastic changes can be reversible. There is sitting of gray metal in the dorsal prefrontal cortex and those pay catastrophizing actually did reverse after a course of CBT.

Now that we have taken a look at the main foundation, what are some of the key players in terms of pain quantification and how pain does become [Indiscernible], going to take a look at specific psychiatric [Indiscernible] concerns and how they interplay with chronic pain. These are generally symptoms that you see in depression, how one could potentially make a diagnosis in depression. When we look at that correlation of pain depression, 30% to 60% of pain patients report some sort of comorbid depression pathology. It is associated with higher economic and treatment costs, in patients with pain and comorbid depression are also going to report greater pain severity, worsening functioning and more disability. 50% of patients diagnosed with depression also experience some sort of physical pain, kind of goes both ways.

In primary care setting one study reported 60% of all patients who initially presented with a pain complaint would have been diagnosed have they been evaluated for a comorbid psychiatric [Indiscernible]. There is a lot of different interactions, a lot of different explanations for the relationship between pain and depression. One of them is persistent pain interacting with a lot of individual social vulnerabilities matched which may participate in episode of depression. And vulnerabilities will come in later on in the presentation where we talk about personal history, family history, or psychiatric illnesses, developmental deprivation, loss of a parent, substance use, all of those kinds of different aspects of life that may predispose someone to being more likely to have a psychiatric illness.

Depression is also thought to be an inflammatory response in the brain elicited by pro- inflammatory cytokines. The cytokines trigger and identify or have the ability to reduce the capacity to tolerate pain. Pain processing and [Indiscernible] are both controlled by common neurotransmitters such as serotonin, [Indiscernible] and glutamate. About the rise out of the same underlying process. For example like MS or fibromyalgia, both processes are stemming from diseases and may elicit both responses of pain and depression.

We kind of touched on already pain and depression is a Bidirectional relationship. One can easily manifest or exacerbate the other. They both detrimentally affect the others recovery time and symptom duration. This connection is supported by several mechanistic pathway's kind of underlying pain and depression. We talked about cytokines, hormones and neuropathic pathways.

Depression can predict pain or predict somebody, how somebody can tolerate or interact to pain. Those in the short-term and in the long term. Some potential reasons for this is the combination of pain and depression, but not the sole presence of pain was found to be associated with negative health cognitive bias leading patients to be more aware and more focused on their pain and disability. Depression and anxiety bring about a negative appraisal in the form of pessimism and worry. This impedes somebody's ability to cope with their pain. Emotional distress is going to impair somebody's motivation to participate in rehab and adhere to treatment plans which demand a lot of energy and resources.

Catastrophizing, personality traits and adult attachment styles are also involved in someone's ability to adapt to pain. This is why not all pain connotations have depression. We take a look at these depression symptoms will more time to get an idea, maybe we are very familiar with these. Talking about how difficult it is or can be to diagnose depression with somebody who has chronic pain. It so complex it can be very difficult because the symptoms overlap. There's a couple of different models that one could use to kind of figure out if they're truly is an underlying depressive pathology. One model is called the inclusive model. You can use all of the symptoms for depression to make the diagnosis, even if they could be explained by the illness does physical errors or play. It simple, fairly reliable but can result in some over-diagnosis.

There is another method where we leave only the cognitive symptoms from which to make the diagnosis of depression. Patients with chronic pain and depression are more likely to describe increased sadness, reduced self-worth, lack of meaning, and suicidality than those who just a pain alone. This could give support to using this type of method to diagnose. Another one is the substitute of method. The somatic symptoms of depression with additional cognitive or affective symptoms. You could use [Indiscernible], irritability, fearfulness, social withdrawal. Depends on what symptoms you can use, how many you have to meet in order to reach the diagnosis but that is one way that you can kind of add some other symptoms from which to diagnose. Then lastly, this is required straight from judgment.

The analogical model says that the judgment by the clinician as to whether the symptoms are related to physical illness or depression is completely up to you. This is a disadvantage in that the reliability solely based by clinician. There is no one approach which we should use when the diagnosis is less clear. Maybe there's a [Indiscernible] affect, cognitive symptoms. It's best to get collateral, like a patient's family like clear and persistent change in mental State over time.

Moving on to anxiety now in kind of our general anxiety symptoms and what someone with anxiety would be demonstrating. Some anxiety symptoms may have a higher comorbidity rate with certain chronic pain conditions been with the present.

One study showed 20% -- toward arthritis had anxiety as opposed to 50% of patients having depression. Comorbid chronic pain and anxiety disorders are significantly associated with negative outcomes like Poor Quality of Life top functional limitations, substance abuse and suicidality. It isbeen suggested high comorbidity between high anxiety and chronic conditions may explain the framework, maybe explained within framework of mutual maintenance model or shared vulnerability model.

These are ways to conceptualize the interaction between the two. The mutual maintenance model based on physical and effective components of anxiety that's going to exacerbate pain. Similarly, these components of pain are going to exacerbate anxiety. The shared vulnerability model, anxiety and pain share a large number of predisposing factors like a high sensitivity to injury or anxiety, biases, low threshold for threat reactions. These models are not mutually exclusive. You can use both of them to conceptualize interaction. But in addition, both anxiety and chronic pain share a number of predisposed factors like [Indiscernible] exercise, pain and anxiety sensitivity, and many others.

We can use migraines, for example, kind of highlight the relationship between pain and anxiety. The vigils with migraines and anxiety report three times more severe pain than people with just migraines alone. They also report increased frequency of headaches, worsened anxiety in-between the episodes, and avoided behavior. Using paid severity, especially kind of at scale may be problematic because anxiety is strongly associated with catastrophizing, which is important factor to intensity, disability and treatment response. Anticipation and anxiety too [Indiscernible] episodes maybe more disabling and more severe for a patient that already suffers from anxiety. Just like in depression, treatment outcomes are [Indiscernible - muffled] we have comorbid psychiatric conditions.

There is a positive interaction between negative emotions like fear, anxiety, sadness, depression and pain. Two major structures involved are the ACC, which we talked about a little already and the amygdala. The amygdala, in particular, we think as being responsible for emotional anxiety and fear. When you stimulate the amygdala, [Indiscernible] anxiety and fear. When we [Indiscernible] a lesion we impair our ability to express this. Information from a bunch of different sensory modalities, including painful stimuli are going to reach the amygdala. The amygdala is going to then send out a signal to the brain, hypothalamus region got what you are going to initiate some sort of behavior [Indiscernible] hormonal response. Human imaging studies indicate that anxiety is likely also related to ACC dysfunction, just like the amygdala.

Anxiety about pain has also been reported to enhance pain, and the ACC is one of the important regions for this. Specifically, and imaging studies show that ACC is activated when anticipating pain and is going to be painful. This is also activated when we see sad facial expressions and in

healthy subjects going to increase the pain rating. ACC neurons receive input from the thalamus and the somatosensory cortices, and then they are going to receive the emotional fear and anxiety from the amygdala.

This integrates all of this information and what makes it really important call this area, in particular, is the glue matured six synapses, all of the neurons, the connections in the ACC are plastic. They learn and they change. They remember.

Moving on to insomnia, we touched on this a little bit with the case that we opened up our presentation with. This is kind of what we conceptualized as somebody has true insomnia. The CDC estimates that we are going to spend a ton of money on insomnia as well. We're looking at $50 million to $70 million. $100 billion loss on productivity and 70 million adults having some kind of chronic sleep and wakefulness disorders. Insomnia has been considered a consequence of chronic pain; research findings are showing that sleep disturbances have a Bidirectional relationship with chronic pain. Like we see what depression and anxiety as well. Insomnia may act as a precipitating factor and a perpetuating factor for pain. Is independently associated with the proceeds of pain on daily functioning and life satisfaction and people chronic spinal pain.

There's a really close interaction between central sensitization and sleep disturbances in people with chronic pain. As we take a healthy person who doesn't have any pain and we do pry them asleep for a whole night, studies have shown that we can actually induce pain or induce generalized hyperexcitability and increase it in people. Lack of sleep will also impair our own ability to decrease are own pain and increase spontaneous pain. These are the findings that show the nervous systems not only perpetuate this hyperexcitability in people with chronic pain can also be a causal factor. This turns into a horrible cycle where poor sleep quality lower pain thresholds contributes to hyperalgesia and subsequently increased incidence and severity of insomnia. The dopamine pathway plays a cardinal role in both sleep regulation and are own ability to treat are own pain or tolerate our own pain.

Decreased dopamine availability can explain sleep disturbances and kind of the dysfunction of our ability to treat are own pain. We look at past or current substance users their dopamine circuits may be altered as a consequence of repeated activations associated with consumption.

Serotonin is very important in the cycle two. Serotonin dysfunction can result in altered patterns of circadian behavior that can contribute to a disruption of our sleep homeostasis, along with the dysfunction of ability to combat pain. And then are own opioid signaling or opioid neurotransmitter pathways is implicated in the sheer modulatory mechanism of pain and sleep regulation.

Opioids in general our known to influence sleep-wake regulation in at least some part by central opioid input in the ventral lateral prompted nucleus but this is a key subgroup that produces sleep behavior. CNS inflammation can actually, so we have impaired sleep [Indiscernible] this can result in a low-grade inflammatory response. You see increased levels

of interleukin six, prostaglandin E2 and nitric oxide that mediates information. Cytokines interfere with our ability to mediate fatigue and correlate with observations of increased sensitivity to painful stimuli following sleep restriction. Stress and Sleep are consistently interconnected. Increase nighttime arousal and decreased sleep efficiency are among the most sensitive sleeve variables in response to stressors.

Health anxiety also described as being a significant predictor of insomnia severity of the, and the ad may trigger insomnia by [Indiscernible] in patients. Depression accounts in part for the variation of Sleep Quality among people with chronic pain. Individuals with insomnia often show high levels of apprehension around that time, and almost like performance anxiety in an attempt to control the process of sleep onset. Alcohol can be really tempting in our patients to help with insomnia, but we see that although drinking right before bedtime were reduce our sleep onset [Indiscernible], decrease the time it takes to fall asleep, it's also going to increase slow wave sleep in the first half of the night. This is going to lead somebody to think that they got better sleep. In general, it's going to increase arousal after we fall asleep, particularly, the second half of the night and well [Indiscernible]. Alcohol use is associated with same-day reductions in insomnia symptoms, followed by exacerbation of symptoms of insomnia and heavy drinkers. We will talk about treatment options later in the presentation.

The one thing you can keep in the back of your mind is [Indiscernible] option would be cognitive behavioral therapy for CBT-i. These are some of the core principles that they use to treat that. Pinpointing different actions that can prohibit sleep, potentially using sleep therapy and in general a lot of education about what sleep hygiene is.

Moving on to substance use. Although it's often assumed that chronic pain is substance use disorder, it can go both ways. Sometimes Substance Use disorders proceed onset of chronic pain among those with both. That happens about 58% of the time with someone diagnosed with both. Almost 92 million U.S. adults use prescription opioids in 2015 misused them somehow and used them in a different way than was prescribed.

The national comorbidity survey says about 35% of those with a lifetime substance use disorder reported some sort of chronic spinal pain. Of the adults with chronic pain who consume alcohol, one in four is going to screen positive for harmful drinking. That was on a self-report measure. Imagine what we would have if it was something more standardized.

Patients with comorbid chronic pain and substance use disorder present that health care while treating the pain and addiction in an integrated manner. This generates heightened cravings and perpetuates the substance misuse. Addictive behavior is ingrained in pain neuropathology because of all of these plastic changes we talked about. They're comparable to what long-term substance users, even in the absence of prior drug use have in their brain. That overlaps in brain regions because they are engaged by ongoing pain, it's on said, it's offset, addictive behaviors and analgesic drugs. Both types of stimuli both pain and substances are associated with massive dopaminergic surges and reward, motivation,

learning centers. In general, we talk about our own bodies ability to deal with pain, when we have pain, we release are own opioids. This also may come as reinforcing kind of mechanism.

There is evidence that we have some repetitive [Indiscernible] self-injury can reinforce very similar qualities and that why they may act as a coping mechanism and be adaptive for some people. When we compare the two substance use disorders and pain, we see the significant overlap. The tolerance of pain, tolerance of pain medication, those giving up or reducing activities can impair someone's functioning. Cravings during pain, motivation to escape pain. Both have some sort of opioid response taking larger amounts of the substance or increasing pain medication to avoid pain and withdrawal. Sometimes we see in patients with pain an unsuccessful drive to eliminate the pain. Spend a lot of time thinking about it.

Substance use disorders you see a lot of time spending to obtain the drug or using the drug. In pain you spend a lot of time catastrophizing or spinning abnormal amounts of time thinking about the pain. Specifically looking at opioid use disorder, we see these diagnoses among those on long-term opioid therapy was about 8% to 12% in a recent systemic review. It's really hard to make these diagnoses for a number of different reasons. One of them being that the DSM-5 criteria for opioid use disorder can be attributed to pain, part of it can. And that the procurement of opioids for pain technically was in the therapeutic context. Technically receiving medical treatment.

There is higher variability in pain fluctuations or pain volatility, and our relapse rate and poor outcomes after the talks of occasional for the long-term opioid therapy. Also see a high level of persistent pain after opioid use cessation. A lot of patients are unwilling or unable to taper their long-term opioid therapy, despite kind of known medical and functional deterioration. We sometimes see [Indiscernible] overuse disorder behavior when we decrease the amount of opioid they are getting or take them off of it completely.

A framework we can use is using the term Multimorbidity in substance use. Knowing disabling chronic pain, especially among those with substance use SC disorder often involved in this multi-morbidity. And of all the hearing combination of chronic pain condition, psychiatric and medical comorbidity, polysubstance and medication dependence. Likely a really complex set of pain related maladaptive qualities that are going to be influenced by all of these different factors. Recently there is also growing recognition of increased burden of chronic pain and opioid use wallowing recovery from some life-threatening medical illness, TBI, [Indiscernible] cancer. Several infections and [Indiscernible] like a but that is, HIV, Liver Disease can only to chronic pain symptoms as well. 87% of people with chronic spinal pain reported that at least had one other comorbid condition both of those were chronic pain conditions. Some of them were chronic physical conditions and mental disorders.

We see an increased risk of suicidal ideations, plans, and attempts among those with chronic pain substantially mediated by comorbidities, including substance use disorders, mental illness a medical illness.

Someone combating can reexplain the pain. Patient with disabling chronic pain is substance use disorders or medication dependence often present in a state of personal crisis. The initial goal of management of this is that should be achieving some sort of clinical stability. And then slowly transition from disease focus, provider-based management to a whole person focused self-management of pain and comorbidities. Lastly, we are going to take a look at the association between pain and suicide. Amongst people with chronic pain, rate of lifetime suicidal ideation, these are going to be pretty broad ranges, range from 21% to 50% when we look at current ideation, kind of up to about 24%. And we look at rates of lifetime suicidal attempts, having kind of the comorbid [Indiscernible] and suicide attempts are 5% to 14%.

The rate of suicide among veterans with mild to severe pain ranges anywhere from 45 to 81 per 100,000 person-years. When we look at-risk factors specifically associated to pain, with the high levels of mental health problems, hype and intensity, analgesic medication use, and pay related psychological factors that we talked about already. There is a greater rate of completed suicide in chronic pain patients relative to the general population. Some of those cognitive constructs that relate to this are catastrophizing, dealing with one has a debility and kind of decreased social connectedness. The cognitive difficult are going to appear once ability to use adequate coping strategies. Mental health concerns interact with chronic pain patient populations, it's important to note positive symptoms associated with chronic pain may also impact suicide risk.

This is kind of a nice chart of looking at all of the different risk factors. Probably is something to keep in the forefront of your mind when you are working with chronic pain patients is that, that in general, is a suicide risk factor. Not even accounting for all of the other risk factors that play a part in the pain, how they are dealing with pain, and other mental illness or medical illness they may have. Psychological pain is going to occur in the absence of any sort of stimuli that we can see. The association though of that pathway triggers much of the same areas related to processing of physical pain. There is no number of stimuli we can see that it travels fairly similar pathways. There is significant overlap in the neurocircuitry that we see between pain and suicide. We see there's actually decreased brain volume in the ACC.

There are prefrontal cortex, dorsolateral prefrontal cortex and amygdala which have been reported in attempters compared to non- attempters. A lot of those we have already talked about you in different psychiatric illnesses. There is one way that I found really helpful and makes a lot of sense to me in terms of a theory of how to frame this increased risk for suicide. Georgia has a personal theory of suicide. These kinds of states you need to meet a couple of different criteria and this is how somebody overcomes all of the barriers to actually harming themselves. He said it was associated with the desire to die by suicide and the capability to die by suicide. When we slip down to desire there is to do big terms, he uses to explain that desire. One is perceived burdensomeness and thwarted belongingness.

Among patients with chronic pain, both perceived burdensomeness and distress and interpersonal relations were really significant predictors of suicidal ideation. Considering the theory that individuals of pain disorder may desire death by suicide, because they have diminished or social disconnectedness, so they have this perception of burdensomeness related to their disorder. Klonsky and May build on this theory of joiners and came up with an ideation-to-action framework for suicide.

This places capability of attempting suicide prominently in that transition. They believe that the second half of jointer's theory, the capability to die by suicide rises from painful and [Indiscernible] experiences took it has been described in terms of lower fear of death by repeated exposure to painful experiences, that are going to increase somebody's pain tolerance. A potential model of the neural bases for acquired capability for suicide have been seen in areas associated with capabilities, so the intellect, striatum, Thomas, areas important for self-regulation, reward processing and sensory integration.

We look at Joiner's theory of suicide we see painful and provocative events increase our pain tolerance. We can see this and individuals who engage in non-suicidal self-injury as being higher risk for both suicidal attempt and suicidal ideation. The primary function of this behavior is relief and what we think of as a terrible and unbearable State of mind, so it helps function. Its function is to regulate emotion. We also see those persons engaging in non-suicidal self-injury behavior have increased pain thresholds and longer pain tolerance. Chronic pain patients with insomnia and sleep disturbances were more likely to report suicidal ideation compared to patients without any sleep problems. Poor sleep quality increases the risk for suicide by about 34%.

Individuals with chronic pain they experience pre sleep arousal and pay related intrusive thoughts leading to this insomnia. Insomnia, in turn, fortunately, lead to a hopeless, helpless attitude, [Indiscernible] problem solving and coping. All of these increase the risk of suicide. This is importing, sleep quality is a more important determination of suicidal ideation and Suicide Attempts than pain generation, pain severity, we're actual disability among patients with chronic pain conditions.

From A biological perspective there have been postmortem findings that suggest individuals who died by suicide had lower levels of serotonin receptors. Given that serotonin plays a huge role in both the regulation of sleep and nociception, chronic pain, sleep the servants, and suicide they all share the same underlying neural pathophysiology.

Psychosocial perspective: Coping with chronic pain is often experienced as a constant struggle. Restful sleep maybe one of the only few resources that somebody has as a refuge from pain and related negative cognition. Therefore, people who have sleep disturbances, they don't have sleep [Indiscernible] for panic can be particularly vulnerable to suicidal behavior as a means of escape.

Lastly, wrapping up this whole section in general touching on opioids and their link to suicide. We see increased doses of opioids were found to be

a marker of increased suicidal risk, [Indiscernible] be a patient. They had chronic noncancer pain. They received opioid therapy. There are multiple reasons why they think this may be. What to be under treatment of pain so this could increase the suicide risk. Also providing opioids to those with pain could increase the access to potentially harmful means of suicide in a group known to have high rates of co-occurring psychiatric disorders and judgment. Having a greater clinical reliance on opioid therapy may be a marker for poor access to other effective pain management skills, so, we will definitely talk about this later and having access to therapy, physical therapy, multidisciplinary team. One alternative explanation for [Indiscernible] is existing consists of higher doses of prescription opioids track increased likelihood of that individuals suicidal thoughts or plans could act on these underlying [Indiscernible - muffled]. Any questions on this section, in particular, before I send it over to one of my counterparts?

I am happy to introduce, Dr. Meghan Quinn, as our next presenter. All right, good morning, everyone. My name is, Dr. Meghan Quinn. As mentioned I am a [Indiscernible] psychiatry resident at Walter Reed. As the screen says, I do not have any disclosures to be made and I am only sharing my own views and not the views that represent anything from the government, the DoD, the DHA.

Let's get started talking about the biopsychosocial approach to chronic pain. First of all, what is the Biopsychosocial Formulation? If you work in psychiatry or another form of mental health, operably something you have heard of before. It is a way of evaluating how all of the different aspects of the patient's life and experience come together to impact their illness, they're diagnoses, their treatment plan, and their outcomes and responses to therapy. This is first proposed in 1980 by George Ingle, an American psychiatrist and [Indiscernible]. As an alternative to using a purely biomedical assessment, it is the worst Oracle form used up to that point.

A biomedical approach provides exclusively on hard science in our data. Laboratory tests by chemical correction, [Indiscernible] pathology and social. He recognized each patient had unique experiences that also significantly impacted their health and their responses. Because at the time there was no way to reduce these experiences and trace down to the same sort of data that was used the biomedical models Rick these experiences and attributes we're going largely ignored by the medical system. Into this space the proposed of the biopsychosocial model grouping the unique traits and characteristics of each patient's into three broad domains.

Biological, psychological, and social. This approach can be applied to any of the process or medical specialties. It's probably most commonly used in psychiatry [Indiscernible - low audio]. This approach allows us to look at each of these at multiple levels as [Indiscernible] cells and tissue that need too [Indiscernible] back to that purely biomedical model. Or as an individual that interacts with and is influenced the greater world took one part of the whole of humanity. And if the individual that integrates these two perspectives. This allows us to consider factors like isolation and attachment the same focus and

attention giving factors such as laboratory abnormalities or family medical history.

The biopsychosocial evaluation and approach or so important to use because we know that there are these bidirectional links that exist between aspects of health and medicine. Dr. Younghans discussed how different aspects of the brain can be activated by those pains and anxiety. Shows regardless of which symptom present first there is a significant likelihood that the patient will end up developing the other symptoms because the brain and body are involved. The same for depression from chronic pain or Substance Use the chronic pain.

At this point [Indiscernible] matters watch came first. Both symptoms need to be addressed. Using the biopsychosocial model allows us to consider the pain factors and the Affective factors or the mental health factors. The way that we use the biopsychosocial Formulation is to split up the constituent part for each factor, biological, psychological or social, we consider what historically predisposed a patient to the factor. What acutely precipitated the presentation? Factors in their personality, their history that helped maintain the disease condition, and what factors they have present that can help protect against developing symptoms or symptomatic worse and you don't necessarily need to fill out each category under each branch of those. It is a good approach to show you've got to all of the different factors that can impact your patient’s health. This is something the [Indiscernible] University introduced to the medical students during their psychiatry [Indiscernible]. They are encouraged to apply it to all of their different medical specialties and rotations. It is something that can be applied outside of psychiatry.

And if you are considering these additional factors, biopsychosocial factors [Indiscernible]. We want to be able to prove that the psychosocial factors our just as impactful as biomedical factors. In some cases, this has been done by comparing pain in patients who share similar predisposing factors to see if there might be some sort of association. Conversely, homogenous population can be identified, treatment that specifically targets the biopsychosocial factors can be used then change is measure. Obviously, our challenges that come with this in pain is patient reported and to be considered to be a good objective measure.

Circuit measures for pain have been started to be used in place of a subject of greater scale such as by comparing analgesic medication use before-and-after an intervention, we're recently now, using functional MRI imaging to see if there are changes in cortical activation. Understanding the true magnitude of the sensory and effective impact that change has -- pain has on patient is crucial for determining the best way to assess and treat our patients going forward.

When we talk about biological influence of a patient's health and this assessment, we consider aspects of biology that influence health such as brain changes, genetics, the functioning of major body systems, such as the liver, the kidneys or even the motor system. [Indiscernible] smallest level of organization. Here we focus on cells', molecules and the organ system that [Indiscernible] an individual. When you look at the examples

of some of the factors that are considered to be biological, you may be more custom to be seeing some of them like assumptions abuse included with social history. However, research has shown as that substance use and permanently alter physiology, which is what we think it's important to categorize here. Ultimately though it doesn't matter which category you put a factor underneath, as long as you are considerate in your overall assessment every patient.

This tends to be the smallest level of organization only focus on the cells and molecules the organ systems that compose an individual to return. Since pain is not a measure of tissue what is the pairing levels of pain and a 2002 stories looking at the intersection of Pena gender found in a resting state women have more opioid finding while men have more [Indiscernible] to pain and they also notice women have more opioid receptors in addition to pain or in response to pain than the males and suggesting in women the response to pain may be more [Indiscernible] than men. And then in women the activity of the opioid receptor buried in the hormone levels at different times of the month and women may rely on different combination of endogenous pain control intersecting with the biological and the social men with pain historically have been more likely to be offered surgery or opioids women were more likely to be offered psychotropic medication as treatment for depression or anxiety. This integrates some of the social view of pain and the impact it has on our patients.

A 2010 meta-analysis further evaluated the impact of gender and pain and discovered historically males have required more opioid medication to achieve the same pain relief as females and one of the main conclusions of this study linked this to body fat and recognizing opioids are systolic molecules and as a result will have a lower plasma concentration in individuals with a higher body fat percentage as transient and in this case they will have a longer-lasting power because they will be held in the system for a longer time and this may account for the higher incentive side effects in women as they are more likely to accumulate residual levels of opioids in their body and this also may help explain why PCA are initially more efficacious in the males and initially they would have a hard plasma concentration of medication and however, in women those with the bound molecules would persist longer and the difference in body fat are not as significant in pediatric which is part of the rationale in the study while there was not a significant difference in the pain response and pediatrics.

And so earlier we discussed how several cortical regions are considered to be important to the perception of pain and many of the areas have been found to have altered brain matter density with persistent pain and also showed changes in the brain default node network and other resting state networks that suggest long-lasting functional brain changes related to the presence of chronic pain. It is not just a neural component the brain that are affected and non-neural components of the central nervous system such as Michael Brill activation are also shown impacted in patients with chronic pain when compared to pain-free counterparts. We know there are concrete changes that take place in response to exposure to pain.

Fortunately, studies with functional imaging have shown it is possible to reverse the changes using non-biologic and that is psychosocial intervention.

With that let's consider some of the psychological factors that we have assessed in our patients with chronic pain. In the psychological assessment we consider the context of the patient's life in their reactions and behaviors as we have all alongside their disease presentation and the psychological is the intersection of how the small constituent biological parts contribute to a whole into a greater social experience in the world and how it impacts individual.

When we consider psychological factors, they include therapy, behaviors, reinforcement, and most significantly for today trauma. Psychological distress has been shown to be a highly predictive fact of pain levels and trends. Before we dive into trauma, let's briefly consider the defense mechanism. The defense mechanisms are ways all individuals react and respond to the world they are and based on their experiences we can tell a lot about an individual.

Part of the normal human mind they are central for development and mature psychological defenses are subjective to that they serve an adaptive purpose mainly to project and protect an individual from excessive anxiety and to protect their self and self-esteem. However, individuals can also show defense mechanisms that are not as adaptive and the pathologic defenses are characterized by rigidity and overgeneralization particularly in connection with people or situations and they are also an appropriate being out of sync with the developmental level of the individual or valid uptick with the present situation and typically these reflect some aspect of a patient.

Life experience and understanding how a patient reacts and protects himself can give valuable insight into how you will work with the patient to meet [Indiscernible]. And so, affect factors including [Indiscernible] and emotional dissent, distress and thoughts and emotions and behaviors are all significant predictors for increased pain and increased comorbid factors. Addressing a patient’s mood can help decrease their pain but also helps decrease the likelihood that all of the additional fact yours will end up taxing the medical system and being burdensome to our patients and ultimately resulting in better overall health outcomes.

Effective destructors can impact how effective pain reducing treatments are in similar to a reverse placebo effect patients will get less relief from pain management if they are down or depressed or anxious and the more the stress the patient is the greater their experience and impairment is. Simply helping patients have an optimistic outlook can decrease their [Indiscernible] about pain which can lead to a discrete decrease in distress and impairment an increase in efficacy of treatment. As much as we would love to be able to say specific traits and personality or otherwise have been associated with pain syndromes we are not there yet and we know they have an overall impact on pain but cannot specifically pinpoint the type of pain effective.

Going into discussion about trauma and the Acer adverse child study is a collaboration between CDC and the Kaiser HMO in California and the mid-1990s and so the continue efforts to collect difference a day in the initial cohort analyzed over 17,000 adults who had insurance with the majority being white and greater than 50 years of age and having at least some college education. The study looked at 10 specific types of adverse childhood experiences that were split into three broad categories and they were abuse, neglect, and household factors. They then look for associations between the number of adverse experiences and health-related outcomes. Adverse childhood experiences were significantly more prevalent in the study then the investigators initially anticipated and 40% of the enrolled participants endorsed two or more of the adverse childhood experiences and 15% endorsed four or more.

When they looked at the association between health condition and risk factor in health conditions and ACE scores, they found a significant association increased between the ACE score and the list of factors. Knowing about the experiences in the patient's history can help take steps to promote health going into the future and you can better understand why they may be at risk for certain conditions. More than you would otherwise think.

While the ACE study looked at the civic types of trauma exposure and childhood, any trauma at any time in life can impact chronic pain development. Specifically, childhood trauma is associated with an almost 100% increase in chronic pain condition developing in adulthood while broadening the scope to any sort of past trauma is associated with a two or three time increase in chronic pain development. Additionally different traumas have different impacts on pain and for example the death of a parent or a long-term hospital stay as a child may have more impact than a routine surgical procedure followed by a short admission and in short the more traumatic or significant to experience the more likely the patient is to develop chronic pain later in life and curate the impact of that experience forward.

In the past several years mindfulness has become a craze that has spread across the health-related world reporting to how to address a variety of different complaints and research has shown some of the claims made about the impact of mindfulness and meditation on pain are real and those who are experience with meditation show diminished activation in regions of the brain that could be interpreted as indicating disengagement and greater acceptance of the effect of state and a four-day study that was unfortunately did not have a control group the meditation experts repeatedly re-demonstrated decreased activation of the brain regions associated with pain and showed enhancement in the pain processing region suggesting they were becoming more defined how they responded to pain.

Meanwhile, meditation beginners showed increased activity in the areas of the brain that were associated with regulation of the susceptor processing in the areas of the brain that were involved in reframing the evaluation of the stimuli. This suggests the individuals to the process

of meditation were able to recalibrate their brain response to the painful stimuli over the course of the meditative product is. Whether a patient is in meditation expert I never tried it before there is a true pain relief benefit that can be achieved from practicing mindfulness and meditation.

In terms of psychological factors, consider this that many pain patients find themselves in and while this specifically applies to pain you can generalize this to many of the other conditions patients present with. Their experience with pain causes a worsening fear of increased pain or ongoing pain and as a result they avoid activities or situations they believe will exaggerate the painful experience and that is not unreasonably and while in a short-term it is sometimes necessary for healing in the long-term it can lead to deconditioning ultimately in a greater painful experience when the individual ultimately cannot avoid engaging in the factors. This only reinforces the idea the activities worsen the pain and lead to more avoidance from the patient. Perpetuating the cycle. As patients find themselves stuck in the cycle, they began to anticipate the pain and add anticipation of painful stimuli alone and it can lead to a worse perception of pain overall.

The third domain of our psychosocial formulation is the social and interpersonal domain where we consider social factors that impact health such as relationships and interactions with culture and social economic status and more.

Considering some of just a few of the many social and interpersonal factors that can be considered social conditions shape the cause of chronic pain and the long-term impact of it. Pain can have significant repercussions for others in the workplace where they are impeding the ability of an individual to carry out the social role in leading to feelings of loss resentment and both in the individual and in their unit whether it is family or a workplace as a whole.

Historical novels of pain really neglect the role of the structural inequalities that shape the experience of pain and another’s view it let alone the upstream fundamental driving back others such as public policy that medical industrial complex including pharmaceutical and health insurance industries and the social political context that underlies all of the fact there's. Social pain such as social exclusion or discrimination also shares neural mechanisms with the processing physical pain particularly the effect of component and early life course disadvantage can be linked to adult pain and physical pain and this disparity is predominantly demonstrated at safety net hospitals where you have a large number of patients who have experiences with these social economic and political disparities.

Chronic pain can be said to be a holistic measure of health and well-being that it is emblematic of contemporary contested or chronic conditions, and it really is a witness or litmus test of public policy reflecting how the political and economic structure and health of a society in the healthcare systems are focused on all society particular those who are most disadvantaged. Considering Cilicia's nests to present pain by others when friends or families maximize the pain a patient is in

a can lead to increasing disability essentially incentivizing it and it is confusing, think about working with a toddler and when I told her falls down on the playground they often look to their parents to judge how they should react and if the parents are overly solicitous acting worried and running over and making a big deal about the fact their child fell the child is able to pick up on that and react accordingly and crying and screaming and acting extremely distressed and when a parent asked more encouraging smiling and reassuring the child they are okay and stand up and encouraging them to go back to playing the child is more likely to get up and continue on reassured by the reassurance from their parents.

2018 a study looked at the impact of different structural cultural dictation of the realm the experience of pain and found the dominant expectation for patients or painful stimuli does impact the amount of pain an individual shows and individuals who pay more attention to their pain or focus on it more and of having magnified complaints because they are more in tune to their pain, and it is or their variation. This has been in the expense of pain has recently been increasing populations overall and one concern that has come out of the recent COVID-19 pandemic has been anticipated to increase the level of pain but between the social cultural impact of COVID night teen on our population in the post viral pain with [Indiscernible - low volume] and if you put all this together when you put a biosocial formulation consider something to organize your thoughts and you don't have to feel or come up with every single category but you should consider it.

One of the key benefits of going through the process and considering a biosocial flow formulation the impact you have with your patience and your patient disagrees with you about the impact of their disease severity it can significantly impact treatment adherence and willingness to engage in part of the challenge is we don't have an objective measure for pain and looking at the impact on life is important and some suggested the pain due to complexity and the [Indiscernible] becomes a blank slate onto which the clinicians project stereotypes of the exaggeration and physical or psychological weaknesses or strengths anticipated drug-seeking behavior and other stereotypes that may be related to race and gender and ethnicity and class.

To this and medical education and started to recognize they need to address a treatment of chronic pain better and the liaison committee on medical education is an accrediting body for educational programs in schools of medicine in the United States and Canada founded by both the American Association of Medical Colleges and American Medical Association and in 2011 they conducted a study to evaluate medical school curricula and showed only 11 hours were spent on pain or pain related topics. The bulk of that time is spent specifically focusing on opioid prescribing, risk of patient misuse of opioid medication and [Indiscernible] and there is very little discussion on psychosocial assessment and treatment.

Practically all medical students get very limited exposure to chronic pain management in a clinical setting with less than one hour of time to devote to medicine courtship which in many cases are the only exposure patients get to this outpatient management and chronic pain.

Since the time of the study it was published the measures have improved slightly and the 2016 and 2017 annual medical school questionnaire found 143 of the 145 medical schools had some content required courses related to pain or opioids and 144 of the 145 medical schools had content on pain management in their required courses. Over 100 schools also included content about pain management and elected coursework and medical schools and residencies across the country are expanding educational offerings to include additional training medication assisted treatment of substance use as it relates to pain and pain management and alternative pain relief strategies and expanded subspecialty training opportunities in both pain and addiction.

Difficult conversations, so pain patients are notoriously a challenging group of patients to work with and in the late 19th century physicians said when a patient went arthritis worked in the front door I feel like walking up about , walking out the back door and it encapsulates the view a lot of people on the call have about chronic pain and they can be extremely challenging to treat and you can cover a lot of difficult conversations as you try to partner with patient to address their pain. It is complicated, it is challenging, and there are a lot of potentially problematic interactions between the clinicians in the patients.

Opioid tapering and alternative pain managing are increasingly emphasized which can lead to challenging potentially a comfortable patient encounter where a patient is unwilling or uncertain but giving up their current pain regimen because they don't understand the rationale for the changes being suggested. Observational studies done in 2017 analyzed things that came across in outpatient clinic settings where opioid tapering was discussed in four main themes emerged from the study. Most of the interactions explaining the reasons for the taper, negotiating a taper plan, managing difficult conversations with the patients and assuring patients they were not be abandoned. Going into a conversation about pain management with a chronic pain patient is important to have the four things in mind and plan to discuss all of them.

In addition to the topics that came up, the study also spoke to this patient, the patient specifically involved from their perspective for the problems arose in communication about their pain management. Patients offered the following perspective. They did not understand why the dose is being reduced if their medication work. Feeling like they had not had a good conversation. Feeling like they had heard general reasons for why tapering would be beneficial, but none specifically applied to them. Very strongly fillings that clinicians didn't understand the real pain they were in and minimizing the pain they felt. And feeling like they were being treated like a drug addict.

In response to the concerns, they came up with the following recommendations for discussing chronic pain management with patients. It’s important to really hear the patient out and give them the time and space to express their concerns and remember this is a collaborative approach. Hearing their concerns will help you tell your treatment to those anyway they are more likely to agree to alternative management. Giving a patient specific reasons for tapering or medication changes that relate to them and to their cases more likely to result in buy-in and

saying studies have shown this degree of opioid over this period of time is likely to lead to reduced medication benefits does not mean as much as saying you know, based on your current lab values I am concerned for you it may happen if we continue on this path. Invading the or inviting the patient to help her develop their tapering plan can be huge getting them to buy in and let them know they are truly in charge of part of the process they have ownership of what is being done and if you're willing to work with them, so they get the best benefit and outcome possible.

And finally, the alliance between the patient and physician is significant and a patient who trusts their physician or clinician and understands what the person has their best interest at heart is more likely to continue with a difficult pain taper that may in the short term increase their painful symptoms with the understanding it is being done for their overall good.

Some additional recommendations include the suggestion of adding additional support systems and we all want to be there in support our patients and it is not something any one person can do 24 hours a day seven days a week and whether it is scheduling regular follow-ups with a variety of specialist or encouraging patients to joint support groups for individuals with chronic pain or other effective conditions that may be impacted by their chronic pain and keeping patients more with resources to lean on in the process of medication changing or treatment disposition training they're going to be important. Also validating the pain and we can never know what sort of pain patients are truly in, but we can let them know we understand this is something significant and is affecting them on a day-to-day basis. Letting patients know we understand this is a significant and helps fill with the trust and buy-in and education is usually important and many pain patients start off with a goal to become pain free and while that is an awesome goal is not something we can realistically guarantee to all patients with chronic pain. If you have a goal of being pain free and the daily pain level drops from eight to a three you may still be frustrated because it is not at zero which is what you want and if you go to the conversation understanding my pain may not be able to be completely eliminated but it may be able to be lessened significantly the idea of going from an eight 283 is pretty incredible and some of that perception and understanding as a huge impact and finally the other physical and behavioral factors we have already discussed and alluded to because they have comorbid depression or anxiety and are there sleep issues that are exacerbating pain or substance use issues increasing the impact of this and being able to work with them as a whole is incredibly important.

So, with that in mind, I would like to invite you to consider how you may respond to patients with some of the statements and clinician specifically with respect to pain management. Or the discussion about their pain level. Things, you can either unmute yourself or enter your response in the chat box and will give everyone time to respond and go forward with the response that we came up with which is by no means the only correct response to have. And so the first one is in response to your recommendation the patient saying I am not crazy, how might you respond to that?

Okay there are a couple typing in the chat box and that is great. That is great I am not saying that you are crazy. I am sorry if I gave you that impression. Your pain is valid, I can see how much it is impacting you. Really validating the patient experience. I would never say you are crazy. We are here to help you. Those are all great responses to have to a patient who feels like their pain is misunderstood. Asking, that is great, what have I done to give you that impression? Connect a lot of the responses were very similar I believe your pain is real has that big of an impact on you. I can see how much the pain infection your family and for the therapist trying to figure out what makes them feel the need to make that comment digging in and understanding the patient.

Comments I am sure many have heard in response to pain or something else discerning I've already tried that, and it does not work for me. How may you respond? That is fantastic. Figuring out what happened the last time this was tried in learning more about the previous experience what is the same or different or has changed that may lead to a different outcome potentially.

What happened previously, what did they do, why do you think it did not work, those are all great questions and ways to respond. Really encouraging the patient to continue to collaborate and work with you.

That is really what we came up with this well, can you trim about the situation or circumstances last time and once you found out what happened last time, highlighting for the patient what has changed in which led you to believe the outcome will be different. And for the final challenging statement when a patient comes back and just don't understand how much pain I'm in.

Perfect, Irene. Help me understand. There is no way we can perfectly understand the experience patients are having and letting them know that's right I can understand, and I want you to help me understand your experiences and it helps build the alliance and relationship between you and the patient. And that is exactly what we came up with is the team as well and trying to figure out how can I better understand your experience from the patient perspective and help me to better understand you and your experience in what is going on. Thank you all so much for your engagement with the last part and there were some really good responses and really good ways to think about the questions going forward.

I would pretty much anticipate working with the patient population at some point or another you will experience at least one of these questions if not all three of them in a single clinical encounter and it's important to just think through some responses to the so you are able to reply and really show your confidence and expertise handling the situations with your patients.

Here are a variety of references used and at this point we are going to be taking a 15 minute break and when we return, Colonel Ford will discuss treatment options.

Getting back to where we left off, I am Dr. Shannon Ford again and we are going to talk about treatment options. My disclosures have not changed. I still do not reflect official policy of the Department of the Army and Department of Defense, and these are my opinions and thoughts.

And so, treatment planning, after we learned about a patient history and emotional and physical experiences of pain the next thing, we want to do is develop a plan. Plan works best when you have a good therapeutic alliance that will help your patient understand what is happening and shift expectations when necessary and set realistic goals with measurable outcomes and plans should also focus around symptoms instead of syndromes or diagnoses and when we think about symptoms as being interdependent to one another we can identify how the pain may affect mood and mood may contribute to rumination and it leads to insomnia which exacerbates pain in developing a structured approach can also help to have a shared understanding of expert patients and conditions at the first option may not work but multiple next steps to take and be more deliberate to maximize the use of medication and non-foreign interventions that will treat multiple comorbidities and some of the patients may feel like we have thrown stuff against the wall to see what sticks and while it may be true for some [Indiscernible] it is not communicating clearly and repeatedly what you are thinking as far as options for help as it goes.

First and foremost, we need to describe what we are trying to treat and in 2020 the International Association for Study of Pain redefined pain to an unpleasant sensory and emotional experience associated with or resembling that associated risk and actionable or potential tissue damage and paint as night, it is not a diagnosis of exclusion rather a warning signal.

To refresh a few concepts presented earlier, patients experiencing acute pain typically are experiencing adaptive response to an injury all of the receptors to pull us away from a hot stove since acute pain can become acute pain and we should take every opportunity to evaluate the whole patient especially in the veteran population there is an overlap between depression and anxiety and anxiety is not limited to illness anxiety and substance use and pain. There is even a bidirectional relationship between depression and unreported pain and when given the opportunity to treat both we definitely should because we will have better outcomes.

Multiple studies have shown strongest association between chronic pain and depressive anxiety symptoms and the most common symptoms seem to be in addition to depressed mood and difficulty concentrating and loss of interest and overall fatigue. As opposed to what we envision in a classic depressed mood pain it is more likely to be demonstrated is not being truthful with the pain is interfering with enjoying general experiences and having a more negative mood. All of the symptoms give us opportunities for treatment targets. Patients with chronic pain may no longer show injury and some certainly do but they will continue to feel the ongoing effects. At this point and is not a protective feature of evolution either feeling they are and heard or not or exacerbates their systems unfortunately this being increasingly studied with improved understanding and treatment options recently especially in 2019 when ITD

11 added chronic pain for the first time as a diagnosis and 2020 when the ISAP revise the definition that you heard.

Categories can help us determine what avenue to pursue or decide on an approach and it is still categorized into three or four separate groups and it depends on who you ask and neuropathic pain is still attributed to damage to Iser peripheral nerves or structures in general it is a poorly localized [Indiscernible] and can be described as number burning or pins and needles and nociceptive pain can be separated into somatic and [Indiscernible] pain and it is damage to tissue or soft tissue or bone is well localized and described as aching and sharp and visceral pain is injury or damage to organs and tend to be well localized and also described as aching or sharp but can be referred to locations away from initial injury which can confound presentation.

Oncoplastic pain was described in 2016 as a third category developed out of a need to identify pain that cannot be delineated into nociceptive or neuropathic pain categories and it can be viewed as a broad term to apply to clinical conditions that Sherry, neurophysiological mechanism and provide validity for pain previously described as dysfunctional or medically unexplained. Often previously the patients are simply referred to behavioral health because it must be in there had. I thought the [Indiscernible] turned up too high and not the injury itself but elsewhere and that seems like a good term to use when talking to patients in the pain works differently from the other kinds of pain representing a dramatic interplay of [Indiscernible] to the central nervous system and having a psychological component or both and there are no objective biomarkers used to diagnose or more clearly define the pain. It is current category includes chronic widespread pain and fibromyalgia, complex regional pain syndrome, chronic primary headaches or pain, chronic pain syndrome and chronic primary musculoskeletal pain.

I listed a fourth category of chronic pain identified a psychogenic and this is one that is becoming more controversial especially as we understand better how pain works using tools like imaging and having an increased focus on biopsychosocial interplay between cause and experience of pain and one does not have chronic pain as a result of depression rather the two are [Indiscernible].

So moving on we're trying to figure out with patients what is going on in the next to look at is comorbidities. See if something is already being treated and see if we can overlap and optimize both regimens.

Intermec there's really good data of the demonstrating how the behavioral health by Ngozi's are related to pain syndrome in patients with pain are at an increased risk of developing depression and a bidirectional pathway as being depressed or exacerbated one perception of pain and anxiety symptoms also correlate to severity of pain reported. Individuals with the metallization disorders also often have associated pain complaint to include [Indiscernible] somatic symptoms disorder with predominant pain but it is worth noting there's criticism the diagnosis is going to over apologize and unnecessarily attach a psychiatric diagnosis the patient a high amount of perhaps not an appropriate level of emotionless stress regarding their pain.

Discussing personality disorders in this population can be a difficult subject as a strictly many patients cannot explain pain and unrealistic and medication seeking but in reality between 30 and 60% of chronic pain patients also probably have a personality disorder and sometimes more than one disorder and cluster C is most likely to be seen in chronic pain and approach me 10% have a [Indiscernible] and almost 25% are obsessive-compulsive personality structures. Cluster B is also seen the range of borderline personality disorder and chronic pain patients of range from under 10% to 58% depending on the study.

Substance use disorders or something we screen for the population and sometimes a depression or the dependent is secondary from [Indiscernible] and a pseudo-addiction can develop when pain is being undertreated and spreading out short acting narcotics and so there are gaps of thing Control-M the patient seeks relief when it is this taking and gets mistaken for drug-seeking behavior. It is interesting though while we discussed a little diagnosis and the overlap of pain and mood and anxiety symptoms 16% of Americans with mental health disorders receive over 50% of opioid prescriptions and there is a disparity and [Indiscernible] are also frequently prescribed and went together you get the additive depressive affect.

In addition to diagnoses other symptoms are issued and seen in patients with chronic pain including [Indiscernible] and the difficulty identifying and describing one's emotions and having a tendency for externally oriented thinking and not only are the patients more likely to report pain they are also more likely to report greater pain intensity and difficulty improving emotional awareness and the [Indiscernible] that has been shown to reduce psychological distress and decreased pain intensity and negative impact on quality of life and insomnia which we discussed to be bidirectional is difficult to follow or fall asleep when you experience pain or generally centered because you are experiencing pain. In the experience of insomnia likely exacerbates pain symptoms and interrupting the [Indiscernible] can have a positive response operations are seeing pain and experiences and social isolation is exacerbated by both the experience of pain and treatment and the reported decrease quality of life and a sense of missing out on experiences and not being out to accomplish everything they want to and suicidal ideations also is a very real population with some studies finding rates as high as 50% of chronic pain patients experiencing these thoughts and last December the Internal Medicine reported on suicides over 2003 to 2014, 8.8% had evidence of chronic pain in the rate increased over time between 2003 there were fewer suicides with chronic pain compared to 2014. More than half of the population died by [Indiscernible] and over 16% died of opioid overdose.

In addition to figuring out what kind of pain it is and where the patient is that in figuring out what they've tried before is equally important. Probably one of the more frustrating aspects of working with someone with multiple providers to figure out what is worked and what has not and you see if they are [Indiscernible] versus what happened in figuring out what to do about it.

When exploring this with patients, especially as it relates to psychotropic, it is important to not only find out what was tried in the past but the details associated with the trials was it adequate, did they stay in the medication long enough, did they use it appropriately and twice a week antidepressants do not exactly work even if you been on them for six weeks and was the medication augmented with anything or do they have side effects and why did they ultimately decide to not take the medication anymore?

With nonpharmacologic treatment options exploring how the patient felt about the recommendation in the first place is really important and if they do not think something will be effective, they're less likely to engage in it often enough and they will talk the failure up to treatment failure itself and not their behavior. Sometimes they think the intervention will be effective or initially improved it is effective but there are other barriers to implementing the behavior such as taking time off of work to attend regular physical therapy appointments.

Also patient preferences, as part of the clinical practice guideline development patient preferences are always taken into account and may a fair amount of impact what the ultimate recommendations are because of how we know patients interact with us and themselves with regards to positive outcomes.

We have to go back to the concept of ensuring you have a solid therapeutical alliance with your patient and how they view themselves in the sick role is very important when discussing treatment plans and this is often unconscious as opposed to conscious process and identifying goals is important as it allows for progress to be measured and connecting goals to engagement can help in setting a goal to participate in yoga weekly instead of setting the goal to bring the pain level XX an expectation management is extremely important and notably I think ongoing conversations we are already having about not being able to bring patients 20 but focusing on improving function and equality of life.

Whether or not medications will be involved can be a point of discussion and some patients to expect this in a choice and medication needs to also be shared understanding and understanding and some people fear taking medication daily and believe symptoms like discontinuation effects missing it dose of an antidepressant translate and turn addiction as opposed to the side effects in the medication process and others have a history of substance abuse and insist an insight on they don't want to take medications or kinds of medications and when your choice it may also be something the patient is able to do and agreed to engage in.

We are in a ship to we discussed qualities the patients and they are no longer passive in the treatment plan, and they are not necessarily going to zero on the pain scale. We are in the biopsychosocial model and the conversation is pain ending experiences of an illness to be cured and we want patients to have the active role of being improved with quality of life instead of shifting the numbers on the pain scale.

When talking with patients about what they can or need to do to help themselves funding behaviors that are contrary to improving their pain is

important. Pain [Indiscernible] is the excessive and negative focus on the pain itself as well as a psychological distress and severity and negative outcomes. For some it may be a coping skill seeking support from others and there's a way to measure it using a pain catastrophizing scale and the questions measured on a frequency skill of belief about whether the pain will and or improve the patient is overwhelmed and if they can do anything about it there is also a significant other spouse version of the pain catastrophizing scale and it asked what the partner thinks about how the patient choose their pain and on the series the significant others who catastrophize may actually increase the likelihood there is a focus on the identified patient's pain in the increase hopelessness and popular relationship which is ongoing downstream effects on social functioning and quality of life.

Kinesiophobia is the fear of movement due to concern pain will be exacerbated and patients develop avoidance behaviors like hypervigilance and in an effort to have a new injury or recurrence and that in turn leads to worsening pain and disability and one way of objectively measuring this is the scale for kinesiophobia which was first developed back in 1991 and there are 17 items for the patient can identify fear of movement and for physical activity and fear avoidance. There is a shorter 11 item version validated.

Decreased self-efficacy in the belief there are not capable of engaging successfully in an intervention as result of their pain and externalization of the belief and inability to manage pain is shifting the look outward and intervention consider behavior change and desire for surgery or increase medication set of multidisciplinary multimodal approach. Pain associated symptoms don't just present psychological state but also the absence of thoughts into positive psychological states can support effective coping to resilience as well as improved self-efficacy and it provides an important interesting opportunity for intervening in patients who don't have self-efficacy I'm sorry patients who have positive self-efficacy beliefs are more active and more likely to be employed and demonstrate increased resilience and one way of treating this is to use a capitalization model in treating chronic pain identifying and reinforcing patient strengths as a primary mechanism for change instead of a compensation model which focuses on modifying abilities and identify deficits.

I mentioned a couple of skills we can use about objective goals and measures and we really don't work in a system that allows us to care for and infinite number of patients that stick around for support and reinforcement and we are expected to demonstrate clinical progress and the patients are expected to graduate and clinically improved to some experience, some extent and make room potentially in our schedule for new ones and how or having an objective goal helps with research and provides common language and applicability and so we are repeatedly looking for object bulk goals and measures and what exactly does that mean?

A few ways of looking at it when we talk about pain specifically and not pain in association necessarily with anxiety symptoms especially in the context of the opioid crisis which is becoming increasingly important in

the idea about the subject of measurement we can talk about functional status and the ability to walk to the grocery store without stopping and the ability to walk through Disney World without having to sit down every 15 minutes. There is an objective component to that because it is how the patient is defining where their pain is and where they are limited and the ability to do what they want to do. In the first occurs in objective goals and they have the subjective sense to them because pain is such a personal experience and rating scales and outcome questionnaires and pain mentoring all of those depend on what the patient is telling us and it may translate to a number the subjectivity of the experience factors.

Some of the objective measures that we used include the faces pain rating scale and the pain rating scale which are familiar with and the graded chronic pain scale revised and differentiates were mild and bothersome and high-impact chronic pain in a different way of thinking about it and it is six question discussing how often and how intense and whether it interferes with life and it works well over the longitudinal period of time to monitor chronic pain. In the pain outcome questionnaire was originally developed in the VA to look at the dimensional use of pain and now it's a short form that has 19 questions and one demographic and on a scale of 0 to 10 their questions about pain's impact on quality of life and how one sees themselves in relation to their pain. In one sense of safety and emotions about their pain and a lot of the questions focus on the survey that can be helpful would longitudinal tracking as well as the immediate impact on the day they see you in the clinic and the West haven yell multidimensional pain inventory is longer but also validated and designed to examine the impact of chronic pain on patients' lives and now the patient fills were in response to their pain and communicate pain in the extent to which patients participate in daily activities.

In the second section specifically when they talk about their partner it's how the patient feels they are being seen by their family and the significant other version is the reverse how the partner sees how they respond to the identified patient and so it could be an interesting look at how the family is dynamically affecting the pain especially if there is a Mitch match between how the patient feels in with the family member is thinking if the conversation is difficult to initiate it could be a good hands-on kind of approach to address difficult conversations.

This is a defense and veterans pain rating scale I mentioned and I think we are permitting, pretty familiar with it and I would appreciate not just the color scheme but the words at the bottom it helps us know for those with patients what is actually going on in if someone cyst on your office and says their pain is a 40 out of 10 the first thing usually not one of okay let's say what happens when it actually applies to you and hopefully we can work with them to get 10 out of 10 language so it's consistent and easier to have them figure out what you want to do next and were to make intervention. I also think translating the version or the verbiage to a number helps the patient be consistent regarding the nursing and consistent with themselves over time.

And so patients come into our office and if they're actively engaged in their own care, they are likely to have tried a few things we have not

yet discussed and if you search online for back pain the options are quite impressive.

Starting with being aware of home remedies, I would consider all of these as options that don't require a prescription or intervention by a healthcare provider to start or stop or change and I am not endorsing Google and Amazon and I'm just using them for common terms searching the Internet and having impulse buys on your front porch. If you enter back pain into the Amazon search bar you will get heat or devices or massage devices and guidance how to better find research. I was overwhelmed with the options. Then I was overwhelmed with the conflicting recommendations depending on the source. It is really no wonder our patients can be overwhelmed and frustrated.

A lot of the over-the-counter interventions are the same thing they just have different packaging in different names and is more than the generic medication, topical patches and creams they all contain menthol or supplements with varying levels of glucosamine in a proprietary ingredient and also the other thing that we have to be mindful of and realize it's happening is an evergreen tree leaf extract so it is [Indiscernible] right. Those affect opioid receptors and were found on [Indiscernible] and better regulated now but every once in a while, another one pops up. For more regulations get put into place to get or widely available and you cannot get creative on Amazon anymore but you could about eight years ago they are just popping up and your patient may come so just be prepared to search on the Internet if you need to.

The other concern is home use of massage guns and there are a couple of out in the big names are the arrogance and a lot of cheaper generic versions now and actually they have been leading to injury and inappropriate use of massage guns have been [Indiscernible] but being sold as a safe and effective and no medication required in I think we're all familiar with how powerful other people's opinions can be an especially if someone is suffering. There is no consistency in people's opinions online. We don't know if these are accurate or being paid for those. And having this information and being armed and comfortable with some of the information can go a long way in the clinical setting because we can preempt if a patient brings it to her attention and don't waste hundreds of thousands of dollars on something or to have a conversation about what is going on leading them to do these searches and try to find something else and just saying I would not do that does not always go a long way when all of these options with people online saying yes you can that is fine.

Other versions of self-help include electronic self-help and applications available for your computer or your phone in levels of utility inappropriate intervention and recommended by anyone in the medical field. And the [Indiscernible] you stretch to trigger pain, or your pain location user front identify a posture problem that must be their root source of your back pain that was a favorite of mine. And all of this is to say patients are coming armed with information and things they may or may not have tried in the information and where it is coming from and whether or not it is validated is definitely going to bury and much like purchasing things online subscription fees and some of the fees are

expensive and so if we can help patients we don't want to let them spend money n things that may or may not work.

When we make recommendations for treatment, let's start by talking about what interventions we can do that don't involve medication.

When I think about nonpharmacologic treatment options I think it is broken into four broad categories and all of which can be used to treat pain.

The first one exercise-based therapy also term you can search for online and produce an [Indiscernible] and treatment for chronic pain as rest is no longer an activity and the severity and improved physical function gently improve psychological function and quality of life. Yoga is an option and when combined with psychoeducation has been shown affect the and decreasing depression and anxiety symptoms as well as reducing the study looked at chronic low back pain severity. The presumption is all of this is interlinked and that is why it is working.

Other studies have shown that yoga can decrease pain perception and pain interference and daily life tasks and improved mood or decrease stress. Videos are free for various classes and practices are available on YouTube which is a video sharing website for others and I'm not endorsing the brand but also, I would advise to consult a primary physician before engaging in these. I also found on defense.gov an 80-page PDF on yoga and so if you search online there are lots of opportunities for how a patient can help themselves without having to pay money or on their own time and flexibility. Sometimes it is hard to get to a yoga class if you have to register for it two days in advance the day of the class you do not feel well enough to engage.

Tai Chi is a mind-body exercise and weight shifting improving multilingual skeletal strength and stability and it is combined with deep breathing to improve the relationship between body and mind in an effort of balancing opposing forces and it can be done sitting or standing and might be more tolerable for a more intense over exercise for patients with chronic pain. There is a couple of versions of Tai Chi of low impact that may be preferred for someone with chronic pain. In one study with fibromyalgia saw benefits and a 24-week group that was practicing once or twice a week and while it takes a long time to see change the time required for the intervention is not that significant. I think that is one of the pieces of education and discussion having a little bit of change that needs to be brought into the conversation and not one invention may completely fall or solve the problem of knowing Tai Chi in they are also on YouTube.

Mind-body therapies can include biofeedback which uses electrodes to monitor heart and breathing rate and blood pressure and skin temperature and muscle activity and it really depends on what device you are using and we were to think about having to do this in someone else's office or our own but there are do-it-yourself kits online and the goal really is to use these to provide a better understanding the patient has control over their physical responses and some people may our they may be comfortable online and you can see with this is going but once you have a

sense of having control it goes back to the self-efficacy purpose and improving quality of life and belief that things can change.

Mindfulness practice can help our patients and our attention on purpose to the present from a nonjudgmental perspective and regular mindfulness has been connected to reducing a patient's pain experience in house by focusing on relaxation and noticing the breath and body sensation is present tense. The two meditative versions that may be helpful or focused attention where it is a focus on a single dynamic meditative object like breathing and the other is called open monitoring which is more inclusive of proceed thoughts and emotions. Open monitoring allows for experiencing for out of undervaluation but can be more difficult to practice and especially people who have not engaged in mindfulness or practices in the past. Focused attention may be the best place to start.

Stress management for pain is another way describing many of the techniques or coping skills to allow patients to engage in enjoyable activity and relax in managing stress before it becomes overwhelming and can prevent pain exacerbation. Progressive muscle relaxation is another technique for opportunities for mindfulness where muscles are sequentially tense and relaxed by the patients themselves and again done with therapy guidance or on their own and with or without an audio [Indiscernible] and again online you can find videos and scripts and opportunities to help patients with home remedies for interventions or to do something in your office.

Guided imagery is for images to Grady since relaxation and there are script available and again it can be done with therapist help are on the patient's own time and the idea is if you see pain leaving your body your brain [Indiscernible] experience relief in the imagery's scene is created is all of the senses and there is a heightened level of focus and in present tense mindfulness of sorts in the patient sees and hears and smells and tastes and feels all in their [Indiscernible] and can do that themselves and the therapist or the [Indiscernible] provides guidance how to find it. This can also fit nicely into self-advocacy concept of well and the patient can see themselves in the way they want to be seen, healthy, pain-free, feeling it piece, energy, whatever works for them.

If the person can immerse themselves, they can take the beliefs to improve their sense of what it can actually do and it may improve their ability to push themselves out of the comfort zone and studies have shown this to be very effective and stress hormone levels are reduced and improved and the overuse of medication has gone down.

Hypnosis can be used to decrease sensitivity to pain through hypnotherapy [Indiscernible] and there have been improved patient satisfaction when hypnosis is used and compared to when it is not used and I don't think [Indiscernible - low volume] to define but by and large patient to tolerate this well can be effective in both acute and chronic pain and it helps them through childbirth as an anesthetic substitute and surgeries for dealing with TMJ pain and others.

Chronic conditions may not respond to the acute intervention for hypnotic’s suggestions as far as managing pain and they may respond

better or require a dual approach of targeting behaviors and creating a sense of well-being and belief in the ability to improve and increase functional activities similar to what guided imagery can do.

Hypnosis is more difficult to use and some of the other techniques if you are seeing a provider for Ed and you have to know how you do hypnosis in a clinical setting and there's also options for self-hypnosis and if the patient believes in the modality they can find and again you can find this online, they can engage in some level of [Indiscernible] and not everyone is susceptible to hypnosis and in the case of pain management those are suggestible can reduce her pain level by 30% and it was considered cleaning full, clinical meaningful and if you have not heard this it is available and you can search for it it seems like. I like the idea of being able to in this altered the patients as well between appointments to encourage a level of engagement and feeling what they are doing something to help themselves and allowing it to happen on their own time and a fairly safe environment it may improve the plan.

Complementary alternative therapies and spinal manipulation therapy chiropractic intervention have been shown to be very helpful in reducing pain in low back pain and especially much like other things we do we are not entirely sure why it works but one belief is a biomechanical approach where it reduces internal mechanical stress and the other the neurophysiological approach suggests this kind of intervention affects primary neurons from the spinal tissue in order to have the motor control system and processing and it's interesting in some countries this is first-line on pain management but others it is not present in the treatment guidelines.

Massage therapy can be very helpful to relax muscles and tendons and joints and relieve stress and anxiety and it may affect pain perception by simulating nerve fibers and interfering with the pain message processing. It is not often covered by insurance, and it can be cost prohibitive for some patient populations and acupuncture is another option. It can be very effective helping with pain reduction in the studies on acupuncture are mixed and conversations I've had with acupuncture often talk about how the studies are designed and how difficult it is to successfully do a acupuncture as a control and so if it is available it is safe and if it is effective probably worth continuing in the side effect is incredibly low as well.

Similar to acupuncture is acupressure and this is one that a patient can do themselves with guidance and teaching even if it's an online video and I have to do is basically put pressure on and acupoint and it is shown to improve blood circulation and release muscle tension and improve pain and one that is easy to find is the base of your thumb and index finger by placing your thumb in that space and applying pressure for about five minutes moving your thumb in a circle and switching hands can reduce headache pain. This is safe and can be multiple times a day and you can try it while you're sitting here.

Psychotherapy, lots of options to try on psychotherapy. All probably can be used to help your patient improve quality of life and decrease pain severity and there is cognitive behavioral therapy for chronic pain that

has been shown to improve mood and reduce irritability and improve quality of life in addition to reducing pain severity and the VA has a therapist manual online as a PDF and describes 12 sessions we get to know the patient and explain what the treatment is and set goals and go through exercise and casings where the patient is introduced to a walking program and relaxation trending and finding pleasant activities and cognitive coping and sleep and then concluding with discharge planning an optional booster session. It is set up to be done in conjunction with primary care because the primary care person is and shoes their sessions and options in a session there are alternatives and activities to allow the patient to increase the time moving.

Individual psychotherapy is targeted charter behavioral patterns as we talked about and how adverse events can impact on pain as adults and there's one study that looked at the connecting early life adversity with the development of irritable bowel syndrome and we know childhood adversity is associated with abnormal [Indiscernible] and it does begin to make sense targeting life events in therapy can help with things like pain and anxiety symptoms.

Group therapy is also an option and usually in conjunction with individual therapies especially where we are right now work more things are being held online and set coordinated and there are online support groups either in chat rooms and blogs and teleconferencing and whatever the patient feels they fit into bus whatever's best for them, but I would caution and so instead of supportive there may be caution.

Pharmacologic options we will shift gears a little and start talking about what options we have for medication. [Indiscernible] are probably the most used medications when we talk about psychopharmacological and it was in the 1962 be effective for pain when it was being used for patients with depression and the medications are most effective and neuropathic and no [Indiscernible] pain so I'm sorry my slides say [Indiscernible - low volume] and it is believed to be the receptor for pain relief and the medications may also decrease on cytokines and side effects are due to the alpha-1 histamine and receptors and unfortunately the receptors do not do much other than cause side effects and MDA have been hypothesized and have helped in pain management but in the TCA case at least we don't think that is what is happening because results are not seen fast enough if the receptor and MDA which is responsible for pain relief. That effects can have urinary retention or constipation and blurred vision sedation and weight gain and hypertension and cardiac after penalties from technical area and they also [Indiscernible] and it is something that you can talk to a cardiologist before prescribing.

Other or one other type of category is patient [Indiscernible] and these are lethal and overdose and if you have suicidality especially someone who may have a tendency to go to medication when they're having suicidal thoughts the medication may not be the best option or you may want to dispense the medication in seven-day supply with a refill and there are some conflicting studies about efficacy when compared to Charles a placebo but much like other options we try with patients if it works keep going and if it does not work try a higher dose or don't use it and try something else typically the medications do not work overnight and can

take days or weeks to see results and so this is really one of the opportunities to use therapeutic and get buy-in from the patient and it may take a little time may take trial and error to get the best outcome.

These are the most commonly used antidepressants and recommended doses and when using the medications for pain it is off label and we typically start with a low dose of 10 or 25 milligrams and may continue before titrating higher in the doses in the one or 200 milligram range are typically what we use in the antidepressant antianxiety effect and if a solid is can get the same release of pain especially if you use concurrently with another medication a smaller dose is where you want to stop and nortriptyline is the most common and one that causes fewer side effects and it's a [Indiscernible] and may not have been studied as much as amitriptyline but it is an effective medication and they are particularly given at night and the benefits would be to use of the patient has insomnia in addition to pain symptoms and Dr. Pan specific is a brand name of solenoid approved for insomnia and a low dose of the generic.

The serotonin norepinephrine reuptake inhibitors are also another first-line in addition to TCA and gabapentin NOID and again norepinephrine is most responsible for efficacies and pain relief ca be seen in both the absence of mood and anxiety symptoms or with improvement in mood and anxiety symptoms and these are fairly more tolerated side effects can include gastrointestinal distress that results in time and it is axonal [Indiscernible] and that is one of the side effects if you don't have a [Indiscernible] of the patient could happen they may not tell you later and it definitely is one of the other reasons in the most common reasons I switch when I treat for anything with [Indiscernible] and duloxetine has been associated with elevated liver [Indiscernible] and it has been associated with hypertension so you want to use care when prescribing those medications in a specific population of concern.

This category of medication has FDA medication for pain treatment and Alexateen has [Indiscernible] might osteoarthritis and diabetic neuropathy and there may be evidence for duloxetine and other pain syndromes like neuropathy and non-neuropathic chronic low back pain that may or may not have [Indiscernible] and those above 60 milligrams may not be more efficacious [Indiscernible - low volume] and side effects and this is more true when looking at more than just disorders so these are it is were trying and if it does not change anything and the effects [Indiscernible - low volume] it could be poorly designed studies as opposed to actual lack and I use it and patients with headaches pretty regularly and it has [Indiscernible] and then number X- for her fibromyalgia can be used and neuropathic pain syndrome but does not have FDA approval for depression or anxiety.

And SSRIs the [Indiscernible] have also been study for potential treatment of pain syndrome especially they have been efficacious however there's and consistent data since the [Indiscernible] generally well tolerated and it really makes sense to use the class of communication for the TCA and they come with [Indiscernible] and off laid you [Indiscernible] and the side effect profile is fairly similar to the SRI and Celexa 10 can be helpful if it works with your patient and they have

an area which we see in the active-duty population because [Indiscernible] and as a long shelf life and it is more forgiving if they miss a dose and if they are on a week of nights in a week of days and then swing shift it's easier to take the medication more regularly or less regularly without having to discontinuation affect.

Anticonvulsants medications is what we will discuss next although I talk about gabapentin specifically after this and it is particularly they are useful and neuropathic pain especially the ones that are described as [Indiscernible] or electrical or tick like an there are FDA indications that are several miles [Indiscernible] and the mechanisms are uncertain but believed to be related to sodium channel blocking and calcium channel modulation and the medications are also not without side effects and Carbamazepine can cause bone marrow suppression or [Indiscernible] and significant drug interactions to include an interaction with itself and valproic acid can lead to weight gain and hair loss and guess until it to, gastrointestinal discomfort and can make you sleepy and you have to be careful to use in women with childbearing or not using Charlie because there is a risk of neural tube defects because they could not become pregnant and difficulty with memory and word finding and this is definitely typically dose-related and if they are on a lower dose they may not experience side effects and have status change of disorientation and sedation and suicidality and sometimes this is might go to because it has the added side effect of weight loss and in certain populations they benefit especially when you look at how many other medications we prescribed can cause weight gain.

This is some of the typical dose ranges for these medications when treating patients with pain and of note everyone will definitely be started at the lower dose and titrated.

Gabapentin NOID's are another form of [Indiscernible] and not typically used but they are well known for the analgesic properties and they can be used in combination with TCA or S and RI without fear of increasing serotonin levels and they are also considerations to be with [Indiscernible] and gabapentin can be helpful in anxiety and substance use disorders and specifically it can assist in alcohol withdrawal symptom management and decreased cravings and it has been shown to be efficacious in treatment of general anxiety disorder though it is not approved in the U.S. by FDA and so these are generally well tolerated and high safety profile and anticonvulsant cousins layer mechanism and thoughtfully understood and we think it is due to calcium channels and cytokines and the side effects can include sedation which is sometimes a goal of care and dizziness and changes in mental status and be careful on that one and more serious side effects include emotional and suicidal ideation and this is one class of drug where I have seen people develop acute suicidal ideation with no history of anxiety or mood disorder and no history of suicidality and as soon as the medication is discontinued the suicidality resolves and it is one of the ones where I want people when prescribing this one.

The two both have FDA indications for treating pain and gabapentin and doses higher than 900 milligrams predispose this political and I usually stop and then multiple doses per day and pregabalin both with a

[Indiscernible] and usually we start with gabapentin and if it's not effectively switch to [Indiscernible] and usually start the medication at night and he sedation may or may not persist in a patient but usually for the first couple of days it can be fairly significant.

Whenever we start talking about anxiety and medications, I think everyone automatically lanes towards considering benzodiazepines as part of the conversation because there's a reason to use and there can be or the patient wants them. So, they are not analgesics, and they don't have direct effect on pain however one third of patients taking chronic opioids also take benzodiazepine when used together it is a strong consistent predictor of problematic opioid use in a risk of increase overdose because of the depression. In a population that may already be a huge [Indiscernible] rent for increased sub sedation places them at increased risk of complication and risk of overdose if the medications are misused. They may mitigate pain and the secondaries are muscle spasms and we don't necessarily affect pain relief, but they were relaxing the muscle will change pain sensation and there could be a use and postoperative situations and multiple sclerosis and diazepam and neck pain is a combination I see frequently. It may be counterproductive and that is due to tolerance.

Even though we may not want patients to be on benzodiazepine they can be used and these are indications for their use and at the bottom is buspirone and I put it because not because it can work on all patients with pain but a reasonable alternative for patients with anxiety especially of trying to not start benzodiazepine or get them off but it tends to work better at higher doses and one of the medications that tersely does not get titrated and it is worth continuing to follow up on that one. To optimize if it works.

Antipsychotics, increasing evidence of efficacy especially over the past few years. There is not enough data right now for them to find a place in current guideline and the class of medication is very well known toward side effect profile that nonetheless they may be helpful. This can be really important patients that have pain anxiety and insomnia because most are sedating and it can be helpful in patients who have a history of substance use disorders because they do not have the potential for addiction and they will not, they will not develop a tolerance to the dose they are on. Initially they were thought about using or people thought about using these because we know excess dopamine is associated with headaches and we know dopamine receptors are altered in official pain and burning mouth syndrome and fibromyalgia when it was first getting investigated but we see it in association and paranoia and catastrophizing and acute pain dopamine is supposed to be protective but and chronic pain the levels of dopamine really are no longer protective and they become counterproductive and they really persist because the pain and stress [Indiscernible - low volume].

Confounding we have also seen a lack of dopamine contributing to pain syndrome and so a patient may not respond to an antipsychotic and they may actually respond to a stimulant to increase dopamine and there may be some trial and error in the cases as well and I have also seen increasingly Mensa pain with nausea with chemotherapy and this is a drug

case helping a pain chat with pain management you want to consider the side effect profile and notably weight gain and risk of developing metabolic syndrome and also risk of dystonia and tardive dyskinesia and [Indiscernible] especially in the elderly and the QTC prolongations in patients taking medications that also prolong and patients at risk at their own. If a patient is a sense of recklessness and if you start the patient and they have to move everywhere that is probably induced by the medication as well and it dissipates if initially [Indiscernible] as the medication as prescribed and sometimes we say develop a couple of weeks after the medication as prescribed and have to switch at that point.

[Indiscernible] are the best studied bad let the pain is the one that has shown consistent efficacy and fibromyalgia and headache or migraine related pain and intramuscular injections were used in the emergency department during randomized controlled trials and 86.4% who had reported moderate to severe pain or presentation reported mild or no pain at 60 minutes. It is been shown to reduce culture headaches and those are pretty small and it extremely touch of for a liquidation so the recommendation is to not uses primary Essen and Gentile only and be specific in the kind of patient you prescribed for and always use lower doses than what we would be using to treat primary psychotic disorders and schizophrenia or bio, bipolar disorder and another, I would not use it for pain prophylaxis and regardless of how you prescribed it though you want to regulate monitor the weight and circumference and fasting glucose and recommended by American Diabetic Association guidelines what to do about that and you also want to [Indiscernible] of involuntary movement and that is using the Ames scale abnormal involuntary movement and also EKG on patients at risk of cardiac abnormality.

Cannabinoids are also one of the hot topics that get talked about a lot and we know there is an endogenous Indo cannabinoid system that can affect pain and contribute to analgesia and on the market, there are increasing variations of cannabinoids to treat pain but there have not been enough high-quality studies to provide sufficient clinical evidence for the International Association for the Study of Pain to endorse the general use of cannabis and cannabinoids for use. There is a significant promise there is an efficacious management to help with pain management, but cannabinoids modulate multiple and [Indiscernible] and particularly within the brain and we don't really understand this very well and the connection between and so it is very real and smoking marijuana every day can increase the chance of psychosis by nearly five times who have never used marijuana.

So we recently identified a couple of genes and as being potentially contributory to this risk and we are not at the point where we can routinely do genetic testing or any other kind of biomarker to identify patients who may be at risk of developing psychosis versus once you make be able to use this kind of intervention without having that risk. The synthetic form of THC initially used for nausea and vomiting or appetite stimulation in patients with cancer or diseases it was also found to be helpful in patients with chronic pain and once they found it effective for treating neuropathic pain long-term and have pulled patients for over one year so it was a long-term that is real and can be helpful in

patients with multiple sclerosis as decrease episodes of spontaneous [Indiscernible].

And then after this, they are actually effective placebos if we tell the patient if the placebo I think it's an interesting concept and how to better manage pain and the positive results can be mediated by conditioning verbal instructions or social observation interaction there's probably connection to the innate pain relieving system and [Indiscernible] and so along with self-efficacy and improving just how much someone gets out and about at least it is something that can be helpful I know we mentioned this one earlier but the relationship my insomnia and then experiencing pain, some of the sedating medications can lead to harm because they cause sleep disorder and breathing and sleep apnea and first-line treatment for insomnia is cognitive, cognitive behavioral therapy and it is addressing behaviors about how they view their sleep and prepare to go to sleep as well as automatic thoughts that people have and insomnia if they've had it for a long time and they call it siding with your pillow and as soon as you wake up you automatically think about how your sleep was not restrictive the night before and thinking about how nonrestorative it will be in about 12 or 16 hours when you go back to bed.

I prepared to you something not an opiate. If they had [Indiscernible] pain and the pain is waking them up in the middle of the night, sometimes sleep indication is more efficacious because it helps them not move so they will not wake up from the pain, instead of continuing to use narcotics in order to help them sleep. Some of these medications we have already talked about such as Amitriptyline, Doxepin, and Bradsabine. They all have sedating properties as [Indiscernible]. TAZ of the indicated for Mukai depression and anxiety usually at higher doses. Low doses seven and a half to 15 milligrams. It effective for appetite, helping with insomnia. Trazodone is an older antidepressant that was never very effective as an antidepressant. That is because when we use it in doses for anti-depression, we're looking like 600, 800 milligrams total. [Indiscernible] sleep for eight hours on 50 milligrams. If they were not depressed anymore or awake. Twenty-five to 50 milligrams we cannot get people too [Indiscernible - low audio].

Trazodone [Indiscernible] sometimes it may be helpful in diabetic neuropathy, neuralgia and [Indiscernible - muffled] in some patients. Side effect in morning and feeling hung over. With the higher doses. Temazepam, FDA-Approved for insomnia but [Indiscernible] Diazepam. Why you can use a lower dose, 15, 25 milligrams, can develop [Indiscernible] for long-term use. Other Sleep Medications include the drugs, though the Pamtop Cephalon, [Indiscernible]. You may know them better by the brand names.

Melatonin is over the counter. In this case lower doses our better than higher doses. Usually, you can get around one and one-half to 3 milligrams you want to take it about two hours before you go to bed. If you go online, you can find micrograms of melatonin. That is most effective in some people just because the way melatonin peaks throughout the day compared to when you are trying to go to bed. Ramelteon is a prescription medication that targets [Indiscernible] for insomnia.

8milligrams and sometimes 4 milligrams if a patient is overly sedate on eight. Other medications we will see used for sleep sometimes is [Indiscernible], Antipsychotic. Lots of side effects. Almost guaranteed weight gain is about you only, but it does because they. Gabapentin can also help you sleep. That sometimes wears off three to five days after taking the medication. I don't necessarily use that long term for sleep. Diphenhydramine is [Indiscernible] pain but something to ask your patients about. We find it in over-the-counter sleep aids inTylenol, [Indiscernible]. Any of the [Indiscernible] kind of drugs.

In the elderly the side effect profile can actually lead to [Indiscernible], hypotension, [Indiscernible]. Something to be aware of and to have a conversation about. Sometimes are patients with pain complain of cognitive impairment. Sometimes they say chronic fatigue, brain fuzziness, not being able to remember things, not being able to think clearly. More commonly we see this impatience with [Indiscernible] pain. BoardDocs a team is a novel medication. It has been out a few years now. It's classified as a [Indiscernible] multimodal antidepressant and has FDA approval for Major Depressive Disorder. [Indiscernible] is believed to be due to multiple neurotransmitters.

Serotonin, [Indiscernible], a PivotTable, [Indiscernible] and [Indiscernible], as well as reducing the release of GABA. It's typically advertised as having both cognitive actions and can be used in patients with complaints who have not responded to other antidepressants. As mentioned with the Antipsychotic's there is some evidence to indication will respond to increased dopamine activity. Stimulus would also be helpful here. Bupropion as well and the modafinil can also be helpful. This is some population I would avoid the use of [Indiscernible] at the present because side effect profile is exacerbating all of these contraindications [Indiscernible- low audio].

Wrapping up here I want to highlight something that I feel strongly about and should be mindful about. There is too many cooks with patient population sometimes took especially serving outside network like at a Pain Clinic. Very vulnerable to Poly-pharmacy pick in this case more is not better. We tend to see our patrons longer periods of time and more frequently, four months and they see other members from the multidisciplinary treatment team. We have an opportunity to talk about what they are taking, how often they are taking it, how it was prescribed, [Indiscernible] from us. You can refer the patient back to the original prescriber for questions. I try not to adjust medications I do not prescribe myself. Having a good understanding [Indiscernible - low audio] good medication reconciliation is really important when trying to decrease risks.

Serotonin Syndrome is one of those where we start adding some of the medications trying to treat multiple syndromes [Indiscernible] unintentionally, can develop a lot of these medications [Indiscernible] have [Indiscernible] properties. It can be life-threatening. We want to recognize it and [Indiscernible] about potential development. We want too [Indiscernible] about what we can currently prescribed. What I have also seen some special [Indiscernible] develop over time. [Indiscernible] medication and all low doses and independently over time every medication

just goes up a little, a little more and a little more until the patient is pretty miserable.

You don't necessarily think of [Indiscernible] syndrome because you did not have symptom [Indiscernible] they correlate to start a new medication with properties. Sometimes it's adding Tramadol to the mix. Sometimes that actually I have seen it happen when they start taking an herbal supplement. Some of the medications that have stirred to allergic medications and categories were looking at, [Indiscernible] but the common ones we think about. You realize just how easy it is for some of our patients to find themselves on multiple medications, for us to not actually know [Indiscernible - low audio].

Serotonin Syndrome symptoms, like I said, range to be as [Indiscernible] with hypothermia, [Indiscernible], but the mild ones probably more likely we'll see just anxiety, insomnia, Najah/diarrhea, trimmers and [Indiscernible]. Moderate symptoms see things on Physical Exam include Hyperreflexia, visible clonus, sweating, a little more altered mental status. It's not always [Indiscernible] sometimes it is something else. The differential is pretty broad with the symptoms, especially in the mild and vague presentation. It's important to think big, think about what might [Indiscernible] the patient alcohol, Doug Scott meningitis, overdose, all of these. And then refer out [Indiscernible] as necessary. These are cases I usually refer to the emergency department for further evaluation. With that, these are some of my references. I will turn this over to Dr. Bumgardner who's going to put it all together for us.

Good morning, everyone. I'm Adam Bumgardner, one of the third-year residents at Walter Reed. Today we talked about chronic pain, the relationship with [Indiscernible] -ellipsis. Talked about how to construct [Indiscernible] model. We also talked about non-pharmacologic and Pharmacologic. For my section it's going to be very [Indiscernible].

All of the knowledge we gained today in two different cases. I have no disclosures or financial relationship disclosure. Also, reviews are my own and do not reflect official Department Policy, Department of Army/Navy/Air Force or the United States government.

We've gotten our first case. 48-year-old female with history of hypertension and unspecified anxiety disorder, that a motor vehicle accident one year ago. She came in with a couple of things. She endorsed chronic, shooting arm pain. She tried Physical Therapy recently which she found partly effective but did not have time for it. She also discusses she tried one of her friends Oxycodone given for the pain. Along with [Indiscernible] she has recurrent neck spasms. She endorses [Indiscernible] and says she has nightly worried how to balance treating her pain as well as being a single parent. Prescribe medications or Amlodipine and Extra strength Tylenol. Again, her social history is hypertension, anxiety disorder. Social history, single parent with two children working two jobs. She smokes one pack of cigarettes per day. Try to quit previously unsuccessfully. She also endorses a course -- pour Support Groups and she moved to the area. Vitals blood pressure 140 over 85. Exam notable for positive Spurling's sign with the production of pain, otherwise motor function and sensation intact. We have a lot going

on here. We have discussed a great way of approaching [Indiscernible] medication. That is with Biopsychosocial. I would like everyone to [Indiscernible] this model with our patient and I will go back to the first slide, Case Number one for the history. It will take about a minute to read it.

Using a biopsychosocial approach, what your thoughts on the biological [Indiscernible]. Feel free to unmute yourself. Never mind. You cannot unmute so feel free to put your answers in the chat. Talking about the biological domain. [Indiscernible - muffled] Cervical radiculopathy. Hypertension. Excellent. Yes, prior motor vehicle accident. I very much appreciate everyone's input. Neck spasms.

Kind of advanced but exactly, biological, just radiculopathy, neck spasms and has hypertension. [Indiscernible] psychological domain. Coping mechanisms smoking, [Indiscernible] and anxiety. [Indiscernible] social stress. Does anyone else have thoughts on the psychological domain? Feel free to talk about the social one as well.

Exactly. Single mom, for support, working two jobs. Not wanting to talk to them. I agree, for social supports. [Indiscernible - low audio]. Taking into account the Biopsychosocial Model for the patient, what are the pharmacologic options you can think of that would help her out? Thinking broad category base. Yes, sleep aid. TCAs. Completely agree with those. Muscle relaxer. SNRIs. Awesome. Pregabalin.

If blood pressure well-controlled, SNRI daily dosing so compliant may be better center schedule is relatively busy. Very much appreciate your responses. The term for I came up with our Gabapentinoids, SNRIs, benzodiazepines, Cannabinoid. [Indiscernible - muffled]

Regards to the four categories that I gave and medication for the category are gabapentin, lorazepam, the flex of being, Cannabinoid. What are some pros and cons that taking into account the patient's history that would either benefit the patient or create adverse effects for them?

Hypertension. Exactly, [Indiscernible]. [Indiscernible - muffled] Yes, gabapentin can improve sleep in addition to pain syndromes. Another one for gabapentin can help anxiety. Pros and cons help with anxiety, insomnia and Neuropathic pain. Cons, sedation with two kids. Trying to avoid oversedation. Exactly. Venlafaxine, high blood pressure and insomnia. A lot of the major points. CBD, hit-or-miss effectiveness or long-term safety given lack of data.

I think everyone gets the point that gabapentin [Indiscernible] for treating anxiety and insomnia in the short-term [Indiscernible - muffled]. The idea is three times a day on dosing. It can cause hypertension. Venlafaxine, [Indiscernible] anxiety. It can cause hypertension. Lorazepam treats anxiety. Also, muscle spasms as well. Treats anxiety a little too well and [Indiscernible - low audio]. Cannabinoid, some studies say it treats posttraumatic neuropathy. [Indiscernible - muffled] high-quality evidence [Indiscernible - low audio].

Marinol and other THC sources unavailable for DoD. We talked about the pharmacologic agents. [Indiscernible] is very difficult to handle sometimes. You are not the only one managing it. That being said got worse a mad Don, non-pharmacologic you would suggest? [Silence]

Chiropractic, massage, exercise, physical therapy, yoga, referral to CBT, TENS unit. I agree. That will be helpful for the patient. Cervical epidural steroid injection. For sure. Maybe she had [Indiscernible - low audio].

All of those pressure can apply to the patient. [Indiscernible - low audio] Physical Therapy can improve joint function and reduce pain. [Indiscernible - muffled] some [Indiscernible] our trained in different manipulation techniques, engaging and care. Maybe that can be with the primary care manager. Acupuncture, we discussed [Indiscernible]. If the patient by the beneficial, them by all means you should support them. Of course [Indiscernible] CBT can help with [Indiscernible] and overall improved [Indiscernible - low audio].

We will go on to Case Number two. 52-year-old male presenting for refill for his hydrocodone work chronic pain. He presents about 15 minutes late. He realized he had either arrived late, [Indiscernible] or had to cancel. Today who wants of the refill for hydrocodone for severe headaches, which [Indiscernible] orbital, unilateral, and [Indiscernible - low audio]. He says the hydrocodone is the only thing that helps. He also discusses Low back pain. There was no dramatic [Indiscernible] event. [Indiscernible] the area multiple times and it's only been that the entry had only been notable for [Indiscernible - low audio]. Additionally, he describes pain 12 out of ten and with hydrocodone about nine out of 10. The last complaint, concern, burning leg pain. He said it's kind of pins and needles that occurred initially then to his toes. Initially prescribed metformin, long-acting insulin, incident as part, hydrocodone, paroxetine, artificial tears eyedrops. History is notable for Sjogren's Syndrome, Major Depressive Disorder, and noted prior hospitalization. Migraine headaches and Low back pain. Type two diabetes [Indiscernible - low audio]. Social history works as an accountant. He says the hydrocodone helps with this pain but kind of create brain fog doesn't feel like he's able to function fully at his job. He also relies on his family for transportation. With chronic pain he's unable to drive himself. He feels he is a burden on his family. Yet countered by saying maybe [Indiscernible - low audio]. His vitals are unremarkable. His exam showed notable for [Indiscernible - low audio]. Otherwise, general remarkable. Cranial nerve, stream [Indiscernible] exam. Notice decrease sensation to vibration and touch from Mitch in and to tell us. Taking that all into account, are there any big concerns? Any red flags in this case?

SI. Why are you concerned for SI? Burden on the family concerning. Maybe I don't belong here. Exactly. You've identified red flags. As mentioned, there are some red flags that we need to be aware with chronic pain patients. One is catastrophizing. As mentioned, kind of and exaggerating response [Indiscernible - low audio]. Again, has discussed with the feeling burdensome and thwarted belongingness. Those are three things to

be aware of. Ask about suicide. Is concerned for imminent danger. When you assess suicide, what do you ask?

Do they have a plan? Perfect. [Silence] Do you have means? Exactly. Any issue of attempts? All of those are critical. [Indiscernible - muffled] Have you had thoughts of suicide; I think is also important? When you are assessing suicide, ask are you thinking about hurting yourself? Are you thinking about killing yourself or are you thinking about suicide? Some who are suicidal may not view it as hurting themselves. I think that is key. I think [Indiscernible - muffled] does he have a plan? Access to means. Previous attempts? One of the biggest factors for another suicide attempt. If there's potential for patient being in imminent danger from suicide, what should you do next?

[Silence] John Johnson says, my facility would escort to ED. I think that perfectly appropriate. Send a mental health evaluation. I agree. There's a lot a way you can ensure patient safety. In the Emergency Department, I think that's a great way. To keep a patient safe and getting an appropriate assessment. They might have [Indiscernible] or ability to walk into a behavioral health. I completely agree with Michael and cannot leave them alone.

For our patient there are no safety concerns at the moment. You proceed to use the appropriate treatment of course for this I chose a TPA, SSRI and [Indiscernible - muffled]. What are some pros and cons for these medications? Typically for our patient.

That is good, TCA can be used for an overdose. Sjogren's. I wanted tie in with these medications. Serotonin Syndrome potential. I completely agree. You tried them on Duloxetine, DDI with Paxil, risk Serotonin Syndrome. Exactly. Yes, discussing the Sjogren's syndrome both [Indiscernible] can cause [Indiscernible] or dry eyes. That is a great point. If you are describing [Indiscernible - muffled] [Indiscernible - low audio]. I think we had a lot of the major points. [Indiscernible - muffled] as well. People so it can be dry eyes and highly overdose. Sedating as well. [Indiscernible - muffled]. Duloxetine, diabetic peripheral neuropathy. Can cause [Indiscernible] and headache. We're getting too [Indiscernible - muffled] but can cause brain fog. Maybe this would not be the best option. [Indiscernible - low audio] as well.

Now it's time for counseling. When I read says, also evaluate and RIOSORD consider prescribing NARCAN for emergent use. I'm not familiar with that. Can you tell me what the acronym means? Respiratory depression essentially.

Now that you have different options let's talk about the counseling portion. As everyone had discussed previously, a lot of these medications [Indiscernible], especially if you're trying to treat with depression and anxiety. A lot of times you have to [Indiscernible] the medication. Of course, risk benefit and side effect. It's always shared decision-making. The dealbreaker is guys for our patience. One of the worst things ever for them. They get dry eyes from the medication; I guarantee you it happens [Indiscernible - low audio]. But also want too [Indiscernible] patients with chronic pain, I was always [Indiscernible - low audio]. A

lot of times they try one, two, maybe multiple different pharmacologic agents. One of my go to is [Indiscernible - muffled]. If it's not working just [Indiscernible - low audio]. Realize there's a lot of options.

Here are my references. I want to thank everyone and very appreciate everyone's input throughout the day, as well as your attention. Any questions or comments on any of this section today we have discussed?

Thank you, so much. Thank you to my colleagues. That's a great presentation. Thank you for all of the information. Very much appreciate it. Thank you also much. There are a lot of thank you's. I will turn it over to Dr. Ford.

Thank you, everyone, for being with us this morning. It was fantastic. We're not going to go anywhere for a few minutes if there are questions. If you are wanting to ask a few of them, that is fine.

If transitioning a patient from Cymbalta 60 milligrams daily for chronic pain to Effexor XR, would you cross titrate? [Indiscernible - low audio] That is true, yes. [Indiscernible] talk about titrating these medications it depends on the patient, you and the [Indiscernible]. I don't usually cross titrate mainly because they never seem to really understand the idea of cutting back on one and starting the others. Even when I write it out they stop one and start the other. Coming attack, I usually reduce Duloxetine to 30 milligrams for two weeks then transition to Venlafaxine. Thirty-five instead of 37 and a half if I were starting [Indiscernible]. Sometimes I talked to patients about starting, stopping one in [Indiscernible] and talk about what that might be like for a couple of days. That they will buy into it instead of going down then going off.

So theoretically, the question was: When you be concerned about reduce therapeutic effect from two weeks at a lower dose? Normally would be transitioning because it's not working. Depending on you can treat symptoms two weeks depending on what your goal was. Sometimes I will start someone on anxiety, and SSRI and try to get the dose high fast or add another something for another week or two to help them through that phase.

[Silence] I think one of the hardest things we do is have our patients suffer, they are in pain, struggling. We are, all right, we're going to do something about it, and you are going to four weeks. And we're like top come back in four weeks. They are like to know. It's a difficult concept for me to work with someone, yet trying to keep the motivation going, keep the momentum going and then realize those small changes can really become big ones is huge.

Yes, I have done Cymbalta 60 milligrams to Effexor Exar 150 MG myself.

Any other comments or questions? That was a great conversation there.