CHAPTER 3

Explaining Psychophysiologic Disorders

AFTER CONFIRMING that the patient suffers from PPD rather than a pathological process, the next step is to outline a treatment program, beginning with education. Many patients with PPDs have been incorrectly diagnosed with disorders that include significant tissue damage. Doctors have told others there is nothing wrong with them despite their significant, even overwhelming, symptoms. For years they have been in pain, and that pain has been aggravated by the fear of having a terrible disease or an unknown incurable condition. These patients need to be approached with care and kindness. They may have been made worse by misdiagnosis and lack of caring. They have the possibility of making dramatic recoveries if they are correctly diagnosed and if they begin to truly understand the source of their symptoms. When done correctly, education and reassurance alone can improve or even reverse PPD symptoms, especially in patients on the left side of the PPD Causation Spectrum (see chapter 1), who have relatively more emotional resiliency and have experienced relatively less severe trauma in life. Once they know their condition is caused by learned neural pathways, is not debilitating, and is reversible, their fear, worry, and attention

to their symptoms begin to subside. It is precisely the neural loop of fear-pain-fear that perpetuates PPD and education can start to alter these neural pathways.

You can tell your patient that if she understands her condition and believes it is PPD then it is likely that she will have the energy and confidence to take additional steps to resolve her symptoms. The more the patient understands and accepts the diagnosis, the more likely a rapid recovery, using the cognitive and behavioral interventions described in chapter 4, will be effective. Some have suggested that some of the approaches outlined in this book are merely a placebo effect. Placebo effects are often thought to be non-specific and able to help everyone to a small degree. However, when neural coding of expectations of chronic pain or other PPD symptoms is the underlying reason for the persistence of symptoms, changing that expectation (which is the definition of the placebo effect) can literally cure the disorder. The placebo effect has been shown to be very effective in certain conditions. In mild to moderate depression, placebo responses are equal to those of anti-depressants (Kirsch, 2010).

Another criticism of this approach is the emphasis on needing to believe that the diagnosis of PPD is correct, implying that this is akin to a religious conversion. However, in order to be successful in the treatment of PPD, a key component is the reduction of fear to decrease activation of the danger/alarm mechanism in the brain. It is difficult to reduce fear when the patient continues to hold the conviction that there is persistent, dangerous tissue damage in their body. Some cancer patients do not accept their diagnosis and may avoid potentially life-saving treatment. For patients with PPD, we believe it makes sense to accept that diagnosis in order to obtain the most effective treatment.

There are four major components of treatment for psychophysiologic disorders:

1) Education on the nature of the disorder
2) Reduction of the danger/alarm mechanisms of the brain
3) Making necessary changes in activities and life situations
4) Processing emotions that are linked to the symptoms

Build the Therapeutic Relationship

Studies have shown that a trusting relationship between the clinician and patient accounts for much of the improvement seen in clinical settings (Safran, et. al., 2006). Take time to listen to your patients, affirm your understanding of their situations, and commit to helping them. These steps can create a strong bond, a therapeutic alliance. For most patients, no one has taken the time to listen and look at the symptoms carefully enough to really understand them—even though the impact of personal, family, and work stressors on patients' health has been emphasized in the training of health professionals for more than 100 years (Peabody, 1927; Stone, 1995).

Patient outcomes improve when the clinician and patient agree on the diagnosis and treatment (Starfield, 1981). This is particularly important with psychophysiologic disorders. Time spent helping patients understand the nature of PPD is an important positive step. We recognize that patients who present with multiple symptoms and who are on multiple medications can be challenging for health care providers on several levels. It is an act of great kindness and wisdom to take the time to look beneath the symptoms to the person under them who is suffering greatly and who, most likely, has suffered greatly in their life.

Reviewing the Evidence

It is important to point out the specific evidence for the diagnosis of PPD. Patients with back or neck pain can be reassured that minor abnormalities seen on X-rays or MRIs are common and due to the normal process of aging; they do not represent pathologic processes. Show the patient data on the prevalence of degenerative discs, bulging discs, and herniated discs in asymptomatic people of varying ages (see table 2.2, page 20). Review instances where pain or other symptoms varied in severity or disappeared for some time to explain that they are due to neural pathways "turned on" and "turned off" by the brain. Explain the links between stressful life events that condition the brain and the body to be programmed for pain or other symptoms. Provide a list of this evidence for the patient to keep and review. It is

often helpful to annotate this list with details that support this diagnosis, such as lists of symptoms, negative tests, and specific instances when symptoms were exacerbated.

THIS MATERIAL WAS REVIEWED with *Elizabeth and her questions were answered. Elizabeth is relieved to know that there may be a reason for her symptoms and asks what can be done about it. It makes sense to her that the symptoms are not caused by structural problems because they have shifted around so much and her tests have been normal. She knows that she has experienced a great deal of hurt and stress in her life and can understand that this may have caused her brain to activate the "danger" response that has produced her symptoms. She is cautiously excited about a new treatment plan but still worried that she won't get better.*

HERE IS THE EVIDENCE LIST FOR ELIZABETH:

- *Symptoms in many areas and in many organ systems*
- *No clear medical diagnosis despite physical examination and multiple workups*
- *Significant adverse childhood experiences*
- *Personality traits checklist consistent with those commonly held by PPD patients*
- *Onset and exacerbation of symptoms associated with significant stressful events*

When There is Uncertainty

There often is some uncertainty in this diagnosis. It can be difficult to prove with certainty that specific symptoms are due to PPD. You can be quite certain the diagnosis is correct if symptoms are entirely removed by cognitive-behavioral exercises (see chapter 4) or by emotionally focused therapy (chapters 5-8). But upon first hearing this diagnosis, many patients are skeptical. Don't argue with them if they are not ready to accept the diagnosis. Ask the patient to keep an open mind while engaging in a treatment program or gathering more evidence. At times, a patient may need more medical evaluations

to completely rule out other diagnoses. The diagnosis may not be proven correct until the patient sees symptoms change with different life events or disappear with psychotherapeutic interventions.

In some patients, some of the symptoms are due to PPD and some are due to structural causes. In these situations, first treat symptoms that are more likely to be due to PPD and see how the patient responds. Later, you may be able to work on other symptoms as you learn more about them through more medical evaluations or by investigating their relationship to neural pathways (looking for relationships with stress or how symptoms vary over time).

PETER IS A BIT MORE SKEPTICAL. *He finds it hard to believe that his pain is caused by his brain when his other doctors and physical therapists have dignosed a structural problem. You review his MRI with him and the prevalence of MRI "abnormalities" in asymptomatic people of his age (see table 2.2). You also show him the MRI findings of patients who had PPD and recovered (with their permission). You point out that he has pain where his MRI is normal and that he had no pain while on the boat. You agree with him that it can be very difficult to believe that intense pain can be caused by the brain and suggest that he keep an open mind as the treatment continues. Since past treatments have not worked, he agrees to move forward with this approach.*

Introduce Psychophysiologic Disorders as a Concept

Discuss the following with your patient. Symptoms are manifestations of an underlying process that must be investigated and explained. Whether the symptom is pain, anxiety, depression, fatigue, insomnia, diarrhea, urinary frequency, or anything else, it's either caused by tissue damage (a pathological process in the body), by neural pathways (a physiological process that can be reversed using psychological interventions), or a combination of the two. If all specific pathological processes that might be

causative have been ruled out, the patient is suffering from a neural pathway problem. Symptoms due to neural pathways are real and can be at least as severe as symptoms caused by tissue damage. Tell patients that you understand their suffering and will work to the best of your ability to help them recover. As mentioned, listening carefully to the patient's story and taking their symptoms seriously is critical in treating patients with PPD.

Explain Neural Pathways

The next step is to explain that neural pathways consist of thousands of brain cells that have formed connections, creating a network that activates specific thoughts, emotions, or actions. They are formed by a process of repetition and connection to specific outcomes or reinforcements (Kandel and Hawkins, 1992; Hawkins, et. al., 1983). Babies are born with innate pathways that govern suckling, turning towards sounds, being attracted to certain tastes, and many other actions. As they grow, the brains of children create thousands of neural pathways by learning cognitive skills such as speech, reading, and mathematics, as well as physical activities such as gestures, walking, riding a bicycle, and many more. Neural pathways mediate the majority of activities we engage in on a daily basis. These neural processes operate in the subconscious, which controls our bodily functions, such as breathing, heart rate, muscle tension, balance, and visual processing.

Help Patients Understand the Role Of The Brain

Emotional reactions are also learned by life experiences and activated by our brains in response to new situations on an automatic basis (Feldman Barrett, 2017). Our brains also activate physical reactions in the body, such as pain or anxiety, in conjunction with strong emotions whether we are actually aware of the emotions or not. Patients with PPD can understand that the brain can activate these physical symptom pathways in response to either physical or emotional stimuli (Kross, et. al., 2011; Eisenberger, et. al., 2006). Most such stimuli occur on a subconscious level, and the patient becomes aware of the cause

only when the reaction occurs in their body or their conscious mind (LeDoux, 1996; Damasio, 2000). With specific PPD symptoms, once the brain has established a neural pathway, they can be continuously or intermittently activated by ongoing subconscious psychological factors, by conditioned responses to certain stimuli, or simply by the neural expectation that they will continue to be activated. Over time, pain pathways can become more entrenched and activated regularly. However, these pathways can also be "turned off," and other non-painful neural pathways can be activated. This becomes obvious when pain and other symptoms occur one moment and disappear the next or when pain moves from one body area to another.

Help your patient understand the process by which pain pathways are formed in the brain. When an injury occurs to the body, nerve signals are transmitted to the interoceptive network of the brain that consists of many structures including the amygdala, anterior cingulate cortex, and other areas. Those structures then activate an alarm signal within milliseconds. This signal *causes* our sensation of physical pain and the simultaneous awareness of danger in the conscious brain. We must be able to feel pain to protect ourselves from further injury by, for instance, removing our hand from a hot stove and seeking appropriate treatment. People who have a complete lack of fear or the sense of danger can suffer significant injuries during the course of daily life.

However, pain does not occur with all physical injuries. Beecher interviewed soldiers who were injured in World War II, and the majority denied having pain (Beecher, 1951). A friend told of seeing a man beaming with pride as he showed his wife a conch shell he'd found in the ocean, oblivious to many lacerations on his legs. Another friend showed a picture of his thumb after he had accidentally shot a nail into it. He had felt no pain and had driven himself to the hospital. Children who fall and skin their knee often cry, but many don't at all; and some only cry when they see a parent arrive with a worried expression on their face (which then activates the neural response of pain and tears).

When pain occurs, it causes muscle tension, changes in blood flow, and activation of catecholamines and the immune system. This process completes the construction of a new neural pathway, which will be stored like other learned behaviors or activities in the brain's memory. A doctor told when as a young man he was injured in the Vietnam War in a firefight, sustaining shrapnel wounds to his left leg. He was airlifted to safety. After his return home and rehabilitation therapy, the pain in his leg went away. Twenty years later, he noticed the same type of pain in the same leg while walking outside and hearing the sound of a helicopter. The danger signal in his brain was triggered by the sound and activated the learned neural pathway and the leg pain.

Tell your patient that the danger signal can be activated by physical injury or also by emotional injury or threat. Studies have shown that emotional hurts trigger the same patterns as physical injuries. When volunteers were exposed to a mildly painful heat stimulus on their forearms, an fMRI showed activation of specific areas of the brain. When they were shown a picture of a romantic partner who had recently broken up with them, the fMRI scan showed that the same areas of the brain were activated (Kross, et. al., 2011). Doctors in Britain reported a case of a man who jumped off a scaffolding and felt severe pain when he saw his foot was impaled on a large nail. He was rushed to the hospital, sedated, and given intravenous pain medications. But when his shoe was removed, the nail was lodged between his toes, and there was no injury to his foot (Fisher, et. al., 1995). The brain can create severe pain when the danger signal is activated, even in the absence of tissue damage, but this pain is just as real.

The fact is that all pain is created by the brain. The same is true for anxiety, depression and other symptoms of PPD. The symptoms are a *message* that the brain is sending to us. When pain is caused by a physical injury, we are being "told" to attend to the injury. When the pain is caused by the brain in the absence of a physical injury, the meaning is vastly different, as would be the appropriate treatment.

When pain occurs, our conscious mind quickly attempts to figure out what is causing it and assesses the severity of the

danger. Is it a matter of survival, a temporary nuisance, or something in between? The answer has a large effect on the pain. When pain is interpreted as being due to a serious physical injury or if it is overwhelming or leads to fear or helplessness (such as being unable to handle an important event or task), the pain tends to be exacerbated. People who respond to pain as if it's a catastrophe are more likely to develop chronic pain (Severeijns, 2001). A key in treating PPD is to accurately interpret the source of pain and control the conscious brain mechanisms that can turn off specific neural pain pathways. The more frequently a pain pathway is activated, the more it becomes a default mode. With treatment for PPD, patients learn to activate the "no pain" pathways to overcome this default mode. This is the neurological basis of recovery from PPD.

Personalize the Information

It is helpful to explain to patients how these neurological processes developed in response to specific life events to create the particular PPD symptoms. Using the data obtained in the life trajectory interview (see appendix), the provider can link traumatic events to the onset and exacerbation of PPD symptoms. Explain that the brain activates an alarm signal to produce pain or fear in situations that are deemed to be unsafe. When we are exposed to stressful life events, our brains create pathways consisting of emotional memory. Neural pathways signifying danger that develop in childhood are particularly strong, including responses to events such as loss, abandonment, and physical, emotional, or sexual abuse. Many patients with PPD, however, have not experienced such obvious trauma but milder sorts of distress, as do most children to some degree. Children with a parent (or two) who are self-centered or who have a disabled or emotionally unstable sibling can fail to meet the needs of a sensitive child. This child often feels the need to be "perfect" to win praise or even have emotional needs recognized. Over time, such a child's brain learns to react to insults, injuries, and traumatic events with strong feelings and secondary physical anxiety.

This danger or anxiety signal can easily become activated by later stressful events, especially if they are emotionally similar. These "triggers" can activate old feelings, anxiety and fear pathways to create PPD symptoms. For example, a woman whose father frequently yelled at her developed headaches when a new boss began yelling at her in a similar fashion. The danger/alarm mechanism was "primed" by her father and then later "triggered" by her boss. Another patient grew up in a family with an irresponsible younger sister, and the patient covered up for her to avoid her parents' anger. As an adult responsible for a large project on a tight deadline, she also covered up for an irresponsible colleague and subsequently developed widespread pain. In these situations, the pain is a message of danger being activated by the brain. Patients are often surprised by the revelation of such links.

Many events—including car accidents, surgery, or other traumas—can be triggers even if not emotionally similar to the priming events. A brain that has a sensitized danger signal can easily develop new symptom pathways with even relatively small insults, such as a minor car accident or a mild muscle sprain, especially if those injuries occur at the same time as other stressful life events. As mentioned, not all patients with PPD have had overtly abusive childhoods; everyone has the capacity to develop psychophysiologic disorders. Most people have had some sorts of psychophysiologic reactions in their lives. It is part of being human and how our brains and bodies are connected.

Through the joint discovery process you conduct, patients often develop a much deeper understanding of the relationship between the mind and the body and can begin to understand that their symptoms are caused by the brain's response to emotional trauma and threats: neural pathways rather than structural disorders (see table 3.1, p 45).

Results of Patient Education

By taking the time to listen to the patient's life story, the clinician can learn about the basis for their PPD symptoms. By carefully explaining the neurophysiological basis of PPD,

the clinician will also help the patient understand that PPD is real and can be reversed. Patients will feel respected, and their symptoms will be validated. That understanding can decrease fear and worry and the pain that accompanies those emotions and increase their ability to heal by strengthening them to face emotional challenges. Several patients have said: "I'm so glad that the pain is not in my head, but that it's in my brain."

A woman with chronic back pain said this after education about psychophysiologic illness:

> "I HAVE HAD *chronic back pain for over 20 years. It has caused significant limitations in every aspect of my life. I have had three back surgeries to try to reverse it, but despite claims of technical successes, the pain has continued. My third surgery, a three-level fusion, was 21 months ago. I have spent this time trying every therapy in the book, anything and everything to get out of enormous and unrelenting back pain. With no success...."*
>
> *"My doctor sent me the link to your website 6 days ago. I went to it the next day and considered the possibility that yes, maybe this could apply to me. I came back a day later to read all the material more seriously and realized: absolutely, this describes me to a "T." With that shift in belief, the back pain subsided—almost like "poof!" It went from a seven to a one on the pain scale, to off the pain scale onto a "discomfort" scale. I believe this was totally due to the complete shift in my belief system—no halfway for me. It came from a total realization: this is me. Then, another big change occurred. Once I really "got it" that there is nothing structurally wrong with my back, on the fourth day, I started walking. I could barely walk around the building at first, but I kept up a steady mantra of "I can walk; I am OK." And there I was taking a pleasant walk."*
>
> *"...what a day-and-night difference—from crippled, fearful, bewildered, discouraged, bordering on despair —to on my way to regaining my life."*

It should be noted that a relatively small proportion of patients have this kind of response to education. For most patients, understanding that they have a PPD is necessary, but not sufficient to eliminate the symptoms.

Managing Mixed PPD/Pathological Conditions

Some patients have elements of a PPD and a structural disorder. These individuals can be treated with a combination of medical and psychophysiologic treatments. Those with pure PPD can be treated with the treatment described in the next chapters.

Some people with mixed presentations will resist the suggestion that some of their symptoms are due to psychologically based brain processes. Be patient. Over time the true nature of the disorders will become evident. If the symptoms change in ways that do not conform to pathologic disorders, if symptoms improve or worsen in relation to psychological or social stimuli, if further medical evaluations do not identify a structural etiology, and if medical treatments are ineffective or worsen the symptoms, the diagnosis of PPD becomes clearer.

A recent patient had paresthesias and muscle twitching in several different areas of his body. He had an extensive medical workup which was normal, which made it clear that these symptoms were due to PPD. However, he also had a nerve-like pain radiating down one arm and had a bulging disc between the corresponding cervical vertebrae. After careful history and physical examination, as described in chapter 2, it was still somewhat difficult to be certain if the arm pain was due to PPD or not. After much consideration, he had surgery to remove the offending disc. Following the surgery, the arm pain and the other symptoms were markedly improved. But two weeks later, all of the symptoms returned. Thus, it became obvious that his symptoms, including the arm pain, were due to PPD. This realization led this patient to be certain of his diagnosis and using the techniques described in the next chapter, he was able to dramatically reduce his symptoms.

The prevalent paradigm in medicine gives little credence to the power of the mind-body connection. It is our hope that

advances in neurology, psychology, and medicine begin to become more widely known and more patients will accept the concept of psychophysiologic contributions to symptoms.

Table 3.1: Key Points in Explaining PPD to Patients

1. **Empathize:** "That sounds horrible. I can't imagine how awful this has been."

2. **Ally:** "I want to help. We need to work together to find answers. What has been tried is clearly not working."

3. **Explain pain:** "Let me tell you about the latest scientific facts about pain (or other symptoms) that most people and many doctors aren't aware of yet."

4. **Personalize:** "Here's how these ideas may apply to your situation."

5. **Offer hope:** "Given all of this information, I believe there is hope for you to get better, rather than simply cope with your symptoms."

Sample Script for Brief Education on Pain Caused by PPD

(Alter the message accordingly for other symptoms of PPD.)

The pain of neural pathway disorders is very real and can be quite severe. All pain occurs in the brain, whether it is due to a structural disorder or not. Pain occurs when our brain activates an alarm or danger signal. Both physical injuries and emotional injuries activate the same danger signal, which triggers pain. People with pain do not always have physical injuries (and people with injuries do not always have pain). When pain occurs (whether due to an injury or a neural pathway process), the brain learns the neural pathways associated with that pain. These neural pathways can become persistent, can be turned off, or can come and go depending on whether the danger signal in the brain is activated. People exposed to stressful life events are more likely to have a danger/alarm mechanism that is sensitive and activates pain and other symptoms. Pain frequently occurs due to neural pathways (PPD). It's part of how our brains and bodies work.

CHAPTER 3 SUMMARY

- *Education about PPD can allay fears and lead to improvements or resolution of symptoms in some patients.*
- *PPDs are common, and most people have them at some time.*
- *PPDs are caused by learned neural pathways and are not associated with tissue damage.*
- *The symptoms of PPD are real, not imagined, and are due to physiological activation of the alarm mechanism in the brain.*
- *PPD is reversible with treatment.*