CHAPTER 2

Describing Somatic Symptoms

In this chapter, somatic symptoms are defined, including a review of the four major somatic symptom categories as well as historical and current terminology from a medical and psychological standpoint. Finally, we review what is known and unknown about the development and associations of somatic symptoms.

DEFINITION

In defining somatic symptoms, the concepts of symptoms and disease must first be distinguished. "Symptoms are the patient's subjective experience of changes in his or her body, whereas disease is objectively observable abnormalities in the body" (Sharpe & Carson, 2001, p. 926). Symptoms comprise the *feeling* of physical phenomena whereas disease represents *evidence* explaining the underlying reason for the symptoms (Eisenberg, 1977). In the case of acute illness, symptoms are the feelings of fatigue, nausea, and fever, and disease is the infection. From this viewpoint, symptoms and disease are *separate constructs*. While they can happen together, they also can happen apart, making it possible for disease to occur in the absence of symptoms and for symptoms to occur in the absence of disease. Symptoms without disease, or somatic symptoms, are the primary focus of this book. Even symptoms without disease are still biological in nature and are no less *real* in their presentation.

Medical Terminologies

Broadly speaking, there are four major categories of somatic symptoms, divided by body system/medical specialty: neurological, cardiac, pain, and gastrointestinal. The various medical diagnoses associated with each somatic symptom category are listed below, along with a brief description of the symptoms, testing options, and recommended treatment. Note that a unique aspect of being a mental health provider who treats children with somatic symptoms is the need to be fluent in both medical and psychological languages. For mental health providers with less experience in the medical world, these descriptions may seem technical and the terminologies unfamiliar. If

this is the case, spend a little extra time on this information, as it is critical that both the medical *and* psychological sides of children's experience with these symptoms are understood and can be easily discussed. The more familiarity a mental health provider has with somatic symptoms, the more confidence is instilled in children and families as they embark on treatment.

That being said, when working with health care colleagues, you will find variability in terminology and diagnostic approach between children or even within the same child, which usually reflects a different focus and training between providers. It is good to remember that a mental health provider *does not need to be a medical expert* in the underlying biomechanics of these presentations or bear the responsibility of coming up with the one true diagnosis for symptoms. No matter what the symptoms are called, there is always a role for CBT to help children manage and cope with symptoms to improve function. Staying focused on those larger goals avoids the confusion that can result from the variety of terminologies used for symptom descriptions.

Neurological Symptoms

Neurological symptoms present as conversion disorder, functional neurological symptom disorder, psychogenic nonepileptic seizures (PNES), nonepileptic seizures, pseudoseizures, functional movement disorder, functional gait disorder, functional gait imbalance, psychogenic movements, spells, numbness, tingling, paresthesia, and psychogenic blindness. The descriptions and diagnoses in the neurological symptoms category are largely consistent with a fundamental diagnosis of conversion disorder. They represent different presentations of a deficit of motor movement or sensation that are not due to an underlying organic neurological disease process (e.g., brain tumor, multiple sclerosis, epilepsy, meningitis). Assessment includes examination of motor and sensory symptoms, looking for neurological signs that are present and those that are conspicuously absent, including laterality, inconsistency in presentation (e.g., gait normal in room vs. abnormal in hallway), weakness, sensory disturbance, speed of gait, triggers, changes in center of gravity, speech, and visual/auditory function (Stone et al., 2005).

In specialty care, children see neurologists, and diagnostic tests are those of *exclusion*, meaning that a *lack* of test results supports a functional diagnosis after organic disease is ruled out. These include electroencephalogram (EEG), video EEG, and magnetic resonance imaging (MRI) of the brain. Treatment includes referral to psychiatrists, psychologists, and/or physical therapists. If children are significantly impaired (e.g., cannot walk or care for themselves), they may be referred to an inpatient rehabilitation program, although this occurs less frequently.

Cardiac Symptoms

Cardiac symptoms present as neurocardiogenic syncope, neurally mediated syncope, vasovagal syncope, vasodepressor syncope, neurally mediated hypotension, syncope, passing out, fainting, psychogenic syncope, presyncope, dizziness, shortness of breath, noncardiac chest pain, dysautonomia, postural orthostatic tachycardia

syndrome (POTS), and orthostatic intolerance. Somatic symptoms that are cardiac in nature include feelings of heart rate change, dizziness, or fainting. Neurocardiogenic syncope, also called vasovagal or vasodepressor syncope, is the most common cardiac somatic symptom (Strieper, Auld, Hulse, & Campbell, 1994). This is a condition where, in response to a stressor (e.g., pain, emotion, sight of blood), there is an abrupt release of epinephrine, which causes rapid heart rate (tachycardia), followed by a rapid slowing of the heart rate (bradycardia) that drops blood pressure, limiting oxygenated blood flow to the brain and causing fainting (syncope) or dizziness (presyncope), either of which can be associated with blurry vision, weakness, sweating, or nausea. Psychogenic syncope, the presence of symptoms without accompanying heart rate or blood pressure change, may occur without a triggering event or in unexpected circumstances (e.g., lying down; Grubb et al., 1992). POTS is another type of cardiac symptom related to dysregulation of the autonomic nervous system. It is associated with sustained increase in heart rate upon standing, which is usually the more unpleasant symptom rather than accompanying dizziness (Raj, 2013; Grubb & Karabin, 2008). POTS is more common in people with connective tissue disorders (e.g., Ehlers-Danlos syndrome, joint hypermobility; Keller & Robertson, 2006).

In the diagnosis of cardiac symptoms, children typically see cardiologists. Testing may include an electrocardiogram (EKG) to rule out problems with electrical activity in the heart, an exercise or stress test to examine heart function, or a tilt-table test, which uses a mechanical table that slowly moves children from a prone to a standing position for 30 minutes or until symptoms are produced (e.g., fainting, dizziness, nausea, low heart rate, hypotension; Strieper et al., 1994). Treatment includes symptom management (e.g., sitting down), counterpressure movements to increase blood return to the heart (e.g., tensing lower leg muscles, flexing/crossing arms and legs; van Dijk et al., 2006), improving overall conditioning (aerobic and strength exercises), healthy habit improvement (increasing hydration and improving sleep), as well as medications such as midodrine, a vasoconstrictor that raises the blood pressure, or fludrocortisone, a mineralocortoid that promotes fluid retention.

Pain Symptoms

Pain symptoms present as amplified musculoskeletal pain syndrome (AMPS), chronic widespread pain, fibromyalgia, complex regional pain syndrome (CRPS), reflexive sympathetic dystrophy (RSD), chronic migraine, chronic headache, any type of functional pain disorder, any type of chronic pain syndrome, and primary pain disorder. A chronic pain syndrome is characterized by recurrent or chronic pain that has persisted for 3 or more months in the absence of identifiable organic disease or that lasts longer than what would be expected from an organic cause (Merskey & Bogduk, 1994). Chronic pain syndromes are understood to be disorders of the nervous system in which the brain regards a part of the body as acutely damaged when it is not. It is also understood through processes of central sensitization and pain amplification, in which pain signals become magnified, sometimes for unknown reasons, or persist instead of quiet down after an initial insult, such as an acute injury that has healed. The pain is real, it's just not happening for a protective reason. Some physicians have suggested adoption of the term "primary pain disorder" to account for chronic pain

syndromes to make the terminology less confusing and to better explain the primary role of the nervous system in chronic pain as opposed to identifying the disorder by body location (Schechter, 2014).

Tests for chronic pain syndromes also are tests of exclusion, in which injury or disease is ruled out (e.g., X-ray, MRI, blood test). Many children initially see rheumatologists for systemic concerns, neurologists for headache, or orthopedists for musculoskeletal concerns. Children are either treated by those providers or referred to multidisciplinary pain centers with anesthesiologists, psychologists, and physical therapists who specialize in chronic pain management. Treatment includes medication (typically *not* narcotic or opiate pain medicines, but rather medications in the antiseizure or antidepressant category, such as gabapentin or amitriptyline that address nervous system dysfunction), physical therapy, and CBT/biofeedback.

Gastrointestinal Symptoms

Gastrointestinal (GI) symptoms present as functional gastrointestinal disorders (FGIDs), disorders of brain–gut interaction, functional abdominal pain (FAP), functional bowel disorder (FBD), irritable bowel syndrome (IBS), gastroparesis, belly pain, rumination, functional nausea, functional vomiting, and abdominal migraine. These somatic symptoms all share the hallmark feature of persistent or recurring GI symptoms—such as vomiting, nausea, abdominal pain, bloating, diarrhea, or constipation—resulting from abnormal GI *functioning* rather than a structural or disease-based abnormality. Somatic GI symptoms are well researched, with positive, symptom-based criteria for FGIDs known as the Rome Criteria, understood to stem from a central mechanism of disordered brain–gut interaction (Drossman, 2016). Children typically see pediatricians or gastroenterologists for these concerns. In addition to the positive Rome Criteria signs, tests of GI symptoms are also tests of exclusion (e.g., colonoscopy, stool test). Treatment includes pharmacological management to address symptoms hydration and good nutrition intake to support proper digestive function, and referral for CBT/biofeedback to help children cope with symptoms and improve function.

Having gone through the four major somatic symptom categories, it is probably easy to see from where some of the confusion regarding what to call somatic symptoms stems. No wonder children and families are confused about these diagnoses—the array of medical terminology describing somatic symptoms is astounding. For these reasons, to eliminate confusion and streamline communication, we recommend picking a single terminology for the symptoms that children are experiencing, which can be as simple as asking the child and family what they usually call it, and use that consistently throughout treatment.

Psychological Terminologies

From a psychological standpoint, there are several diagnoses that can apply to children with somatic symptoms. Many somatic symptoms can be accounted for within a larger psychological diagnosis, such as depression, anxiety, or adjustment disorder, if the symptoms occur in the presence of other concerns. The fifth edition of the

Diagnostic and Statistical Manual of Mental Disorders (DSM-5) has a specific category, called "Somatic Symptom and Related Disorders," that includes diagnoses with prominent physical complaints, associated psychological distress, and impaired function (American Psychiatric Association, 2013). There are seven diagnoses in this category: somatic symptom disorder, illness anxiety disorder, conversion disorder (functional neurological symptom disorder), psychological factors affecting other medical conditions, factitious disorder, other specified somatic symptom and related disorder, and unspecified somatic symptom and related disorder. Common features of these disorders include prominent physical symptoms together with abnormal concern about them, impairment in daily life, and persistence of the symptoms for between 3 and 6 months, depending on the disorder. It is important to note that a chief feature of somatic symptom disorder is that the associated psychological distress and impairment is *excessive*; children would *not* qualify for this diagnosis based on the presence of symptoms and normative concern alone. To illustrate this difference, a large population study of Swedish youth found that while 22.7% of adolescents reported at least one persistent somatic symptom, only 10.5% of the population—fewer than half of those experiencing symptoms—met criteria for a somatic symptom disorder (van Geelen, Rydelius, & Hagquist, 2015).

There was a significant revision to the "Somatic Symptom and Related Disorders" category in DSM-5 to emphasize the importance of making a positive diagnosis based on the *presence* of symptoms and distress rather than basing the diagnosis on the absence of medical explanation (American Psychiatric Association, 2013). Changes from previous editions of the DSM also included shifting away from the term "somatoform disorder," which placed more emphasis on mental illness, to "somatic symptom disorders," which places more emphasis on a biopsychosocial presentation. Previous diagnostic criteria for somatoform disorders focused on the prominence of symptoms being "medically unexplained," with more attention placed on the mental health contribution to the symptom presentation. As the medical and psychological community has recognized that there are limits to how reliably one can determine that a symptom is truly medically unexplained, a more balanced approach has been struck between the role of physical *and* psychosocial factors contributing to these presentations in DSM-5; as such, somatic symptom disorders can accompany medically explained or unexplained symptoms. Additionally, grounding a diagnosis on the *absence* of something reinforced the biomedical approach (mind vs. body), while basing it on the *presence* of something is consistent with a biopsychosocial approach (mind *and* body). This is a critical difference that aids in the understanding of somatic symptoms that we review in more detail in the next chapter.

While this biopsychosocial language facilitates a better understanding of somatic symptoms from a mind–body perspective, the biomedical terminologies that make a stronger distinction between medical and psychological causes for symptoms are still used in the medical world, and you will still encounter them when seeing children in this population. The medical community uses the *International Statistical Classification of Diseases and Related Health Problems* (ICD), a diagnostic manual, and the current 10th revision still includes somatoform disorder and other "psychogenic" conditions as diagnoses for somatic symptom disorders (World Health Organization, 2015). Future revisions of the ICD are expected to align more with DSM-5

conceptualizations. From our base of operation as psychologists, our use of terminologies for somatic symptoms reflects the terminology in DSM-5, with corresponding diagnoses assigned based on those criteria. For a mental health provider working in a medical setting, health and behavior codes can be used for the corresponding medical diagnosis as an alternative to using a DSM-5 diagnosis.

Both medical and psychological terminologies for somatic symptoms have changed and will continue to change over time, mirroring the evolution of our understanding of these symptom presentations and the corresponding changes in diagnostic criteria. Many times, terminologies are used interchangeably; it is beneficial to be familiar with historical *and* current terms to provide the best possible understanding of these disorders and communicate it effectively to providers, children, and families. There is a remarkable amount of discussion in the somatic symptoms world regarding the labeling of these symptoms, including whether they should be diagnosed in a medical or psychological context, and the threshold at which they move from being a physical symptom that causes appropriate psychological concern to one with a highly distressing level of psychological concern. Although it can be very easy to get caught up or lost and confused in what diagnosis to use for these symptoms, remember this: regardless of the label, somatic symptoms cause impairment in children's lives, and the treatment described in this book will help them understand their symptoms and improve their function.

SOMATIC SYMPTOMS IN THE POPULATION

Somatic symptoms are quite common in children, prevalent in both primary and specialty medical care settings and observed in nearly every body system (Campo & Fritsch, 1994; Stone et al., 2005). The most common somatic symptoms include headache, fatigue, dizziness, aching muscles, limb pain, nausea, abdominal pain, and neurological symptoms (e.g., changes in eyesight, balance, sensation, or gait; Beck, 2008; Campo, 2012; Fritz, Fritsch, & Hagino, 1997). A review of patient records indicated that 38% of pediatric and adult patients seeking care at an internal medicine clinic presented with a primary somatic symptom complaint; after further examination and testing, 85% of those cases had no identifiable disease that accounted for symptoms (Kroenke & Mangelsdorff, 1989). In other words, about one-third of patients seen in that outpatient care environment had somatic symptoms. In pediatric specialty care, the percentage of children who present with somatic symptoms ranges from 15 to 90%, depending on the area (Carson et al., 2000). For example, pediatric patients with FGIDs account for up to 50% of gastroenterology clinic referrals, syncope and unexplained chest pain account for 90% of cardiology referrals, and chronic widespread pain accounts for up to 40% of referrals to rheumatology (Anthony & Schanberg, 2005; Rouster, Karpinski, Silver, Monagas, & Hyman, 2016; Stone et al., 2005; Tunaoglu et al., 1995). Although the initial focus may be on one body system, the presence of one somatic symptom usually predicts more, with headache and abdominal pain representing the most common combination (Campo, 2012).

Studies of children with somatic symptoms have confirmed that these problems are rarely found to be associated with identifiable disease later (Kroenke &

Mangelsdorff, 1989). In fact, a review of the pediatric literature reported that fewer than 10% of children initially presenting with somatic symptoms were later found to have disease that could have accounted for those symptoms (Campo & Fritsch, 1994). From these studies, we can conclude that somatic symptom presentations are prevalent and do not mean that we are simply "missing something" from a medical standpoint.

Organic Overlap

There can also be overlap between organic disorders and somatic symptoms. Children who have an organic disease can later develop somatic symptoms, or conditions can be comorbid and present at the same time, for example, comorbid nonepileptic and epileptic seizures, postviral dysautonomia, an orthopedic injury that heals but evolves into AMPS, or inflammatory bowel disease and comorbid IBS. Studies have found that there may be a central nervous system explanation for these overlapping conditions. For example, among patients with inflammatory bowel disease in remission, abnormal brain activity was identified in patients who also had abdominal pain but not in patients without pain, showing that pain can be present in the absence of active disease (Bao et al., 2016). A possible mechanism for this is autonomic nervous system activation, which happens when the body fights off disease and eventually heals but forgets to turn off, and somatic symptoms result. These connections will be discussed in more detail in Chapter 3. As diagnostic technology improves, more overlap between somatic symptoms and organic disease is discovered (Drossman, 2016).

When organic disease and somatic symptoms overlap, it can be an exquisitely difficult situation clinically because it leads children and families to believe that there is something organically wrong—there was before, after all—and it can be particularly challenging to explain somatic symptoms under these circumstances. For example, consider the case of a child who had a brain tumor that presented as headache and gait disorder. After the tumor was removed, he had residual headaches in the area of tumor removal, making it difficult for him and his family to attribute the pain to anything other than tumor regrowth, despite multiple clear scans. Close collaboration with his oncology team was critical in terms of assuring all parties in moving forward with a CBT approach that focused on functional improvement and coping with pain.

Demographics

Both children and adolescents experience somatic symptoms. While younger children (ages 3–5) can have somatic symptoms, they are more common among school-age children, ages 6–18. Girls are more likely to have somatic symptoms than boys, although this may differ based on age; there is a more equal gender presentation during childhood, with increasing frequency of girls presenting with symptoms during adolescence (Campo, 2012). The onset of puberty may play a role in the development of somatic symptoms, such that mood and behavior interact with physiological factors (e.g., hormones), all of which are changing during this point in development (Susman, Dorn, & Schiefelbein, 2003). There are a host of social factors that likely contribute to gender differences in symptom presentation as children get older. Research

has shown that somatic symptoms can carry over into adulthood. For example, children with functional abdominal pain were more likely as adults to have other chronic pain problems (Walker, Dengler-Crish, Rippel, & Bruehl, 2010), somatic symptoms (Dengler-Crish, Horst, & Walker, 2011), and anxiety (Shelby et al., 2013), compared to children who did not have a history of abdominal pain.

For somatic symptoms to be considered as rising to the level of a clinical problem, *significant impairment* from these symptoms must also be present. If children have these symptoms at a low intensity or frequency and/or cope with them well, the symptoms are not considered clinically impairing and no diagnosis—medical or psychological—is made. However, children who experience symptoms with more frequency, intensity, and/or are coping poorly in terms of exhibiting emotional distress and functional impairment are considered to have a clinically significant problem worthy of diagnosis. For some somatic symptoms diagnoses, there is a time consideration. Recurrent or chronic pain symptoms have to exist for 3 months or longer to be classified as a chronic pain condition. Other somatic symptoms, such as functional neurological disorders, require symptoms to be present for 6 or more months to meet diagnostic criteria.

Impairment

Children with somatic symptoms experience high levels of disability and psychological distress (Campo & Fritsch, 1994). Functionally, somatic symptoms are associated with physical impairment, social difficulties, and activity limitations that can range from minimal to moderate, such as missing a few days of school or sitting out a sports practice or two, to severe, such as no longer attending school, dropping out of sports and social activities, and using an assistive device to get around (e.g., crutches, wheelchair).

Children with somatic symptoms can have more impairment from symptoms than children with organic disorders. A study of children with inflammatory bowel disease, a serious organic gastrointestinal disorder, found that they were *less* disabled by their symptoms than children with functional abdominal pain (Walker, Garber, & Greene, 1993). A possible reason for this is that children with an organic diagnosis received corresponding medical treatment that more effectively managed their symptoms compared to children with somatic symptoms, or that the organic medical problems were less chronic than somatic symptoms once treatment was received, or that the diagnosis was less uncertain and therefore less worrisome once identified.

In terms of psychological distress, somatic symptoms can occur on their own or in addition to common mental health disorders of childhood and adolescence (Campo, 2012). The most frequent co-occurring diagnoses are anxiety and depressive disorders, or subclinical presentations of these symptoms; however, children with somatic symptoms rarely have other psychiatric conditions (Campo, 2012). Some research has indicated a higher rate of learning disorders specifically in children with nonepileptic seizures (Sawchuk & Bucchalter, 2015). Assessment and treatment of comorbid psychological concerns are crucial for successful outcomes. For instance, if a child has abdominal pain and also has generalized anxiety disorder, the child's physiological arousal and distress may be too great for him to benefit from CBT

alone, and a referral to a psychiatrist prior to or during treatment would likely result in a better treatment outcome. Similarly, a child with untreated ADHD may have difficulty engaging in relaxation strategies due to attentional dysregulation and may not gain as much benefit if those symptoms remain untreated. For all children, the goal of treatment is to manage symptoms and return to function, while also accounting for the degree to which psychological factors impact impairment and referring for or providing intervention for those additional concerns as needed.

Health Care Utilization

It is common for children with somatic symptoms to undergo multiple, costly medical procedures to rule out disease and return for multiple follow-up medical visits in continued pursuit of the cause of the symptoms (Kaplan, Ganiats, & Frosch, 2004). This pattern of increased health care utilization has economic importance in terms of the cost of health care as well as the effect of the lost educational time for children and productivity at work for parents (Levant, 2005; Kaplan et al., 2004).

Research within specific somatic symptom populations has examined the effects of psychological treatment on health care utilization patterns. For instance, children with nonepileptic seizures frequently undergo many medical and diagnostic procedures, which can delay referral to effective therapies such as psychological intervention (LaFrance, Reuber, & Goldstein, 2013). In Sawchuck and Bucchalter's (2015) retrospective review of nonepileptic seizures in children, they found that there was a *sevenfold* decrease in emergency room visits after initial psychology intake, and partial to full remission of symptoms in children who received psychological care in their model. Teaching children how to improve their ability to manage symptoms and reduce impairment has the potential to reduce overall health care costs to the system and to the families; this is the role of CBT.

Treatment Setting

As noted in the first chapter, the strategies outlined in this book are geared toward delivery in an outpatient treatment setting. The assumption is that the children are able to effectively learn the treatment strategies in this setting and apply them in their daily lives (i.e., symptoms are not so impairing as to affect the child's ability to attend sessions or learn skills). However, some children struggle to gain benefit within those parameters and require a higher level of care. Determining the treatment setting requires clinical judgment, taking into account assessment of functioning, duration of symptoms, and impairment level. If a child has daily headaches that are distressing but do not impair school attendance or participation in activities, this child would be appropriately served in outpatient care. Another child with daily headaches that cause significant mood changes, prevent school attendance, and persist despite medical, psychological, and other intervention may require a more intensive approach, either through more frequent outpatient sessions or referral to a partial day treatment, or inpatient psychiatric or pain rehabilitation program. The strategies in this book are applicable to treatment in any of those settings; the difference is the structure the higher levels of care provide to the child to better facilitate learning or

application of the treatment strategies to improve function and symptom coping that is often necessary when impairment is severe.

So far we have covered the basics of somatic symptoms: they are biological in nature, not due to an acute or identified disease process, can occur on their own or with other medical or mental health diagnoses, and go by many different names. Somatic symptoms present in primary and specialty care with great frequency in every body system, occur most frequently in school-age children, and during adolescence, more often in girls than boys. They are associated with significant impairment and high levels of health care utilization. While they may be effectively treated in outpatient settings, children with more significant levels of impairment might require a higher level of care. After understanding what somatic symptoms are, next up is why they develop.

THEORY AND RESEARCH

Several theoretical explanations have been offered for the nature and development of somatic symptoms through a small but growing body of research. Biologically, one possibility is that an underlying disease *is* present that is not detectable with current medical techniques (Aronowitz, 2001). Additionally, individual differences in physiology, stress reactivity, attention, and sensitization to symptoms may account for onset and maintenance of somatic symptoms (Mayer, Naliboff, Chang, & Coutinho, 2001; Tache, Martinez, Million, & Rivier, 1999). Psychologically, there is a strong association between somatic symptoms and internalizing disorders that, in combination with the experience of physical symptoms, may overwhelm coping efforts (Walker, Smith, Garber, & Van Slyke, 1997b). Environmental and behavioral factors that children experience in their interaction with others, reinforcement, and secondary gain also contribute to symptom presentations (Walker & Zeman, 1992). In sum, the somatic symptoms that children experience are likely the result of a combination of all of these factors.

It is important to note that there are also cross-cultural differences in the presentation and understanding of somatic symptoms. Reviews of research in this area have concluded that there are some patterns of somatic and mental health symptoms that can be thought of as universal signs of distress, particularly for physical symptoms associated with depressive disorders (Bagayogo, Interian, & Escobar 2013). The way in which these symptoms are reported, identified, discussed, understood, accepted, and treated varies across cultures due to a host of sociocultural factors (Escobar & Gureje, 2007).

While there is not enough research to make concrete claims about the exact set of factors that combine to put children at risk for developing somatic symptoms, applying these theoretical bases to clinical presentations in children with somatic symptoms, the following general patterns can be described; they are hypersensitive to bodily signals (biological), have a difficult time identifying or coping with emotion (psychological), and experience modeling of symptoms or secondary gain/reinforcement of disability (social). Each of these factors is addressed in detail to more fully understand the influence of each one.

Biological Factors

A number of theories have been proposed with regard to biological factors involved in the development of somatic symptoms, including preexisting disease (Rangel, Garralda, Levin, & Roberts, 2000), automatic responses in pain perception and autonomic nervous system reactivity including arousal and hypervigilance (McGrath, 1995), and the relation of stress reactivity to internalizing disorders (Boyce et al., 2001). Theoretically, the role of "stress" has been studied in a variety of ways in terms of the biological effects of this process on the body and the strong role it plays in the development of somatic symptoms. Stress can be defined as "an event or experience that expends the resources of an individual" (Blount et al., 2008), which can be physical or emotional in nature. Stress is associated with poor biological outcomes, including immune function (Kiecolt-Glaser, McGuire, Robles, & Glaser, 2002) and psychosocial function (Kanner, Feldman, Weinberger, & Ford, 1987). Stress can be associated with objectively distressing events (e.g., acute threat) or subjective ones (e.g., perceived threat; Blount et al., 2008). It is common for somatic symptoms to be present after a physical illness or injury as well as after an emotionally stressful event (Garralda, 1999). Research has demonstrated that in predisposed individuals, stressors activate *and* change the reactivity of the nervous system, both central and autonomic, such that individuals may develop somatic symptoms that are retriggered or exacerbated in reaction to subsequent stressors (Mayer et al., 2001). We now consider the evidence for the biological and stress factors related to different somatic symptom presentations.

There is a long history of research in the field of conversion disorder on the relation of biological factors to somatic symptoms. Prior to the 20th century, conversion symptoms were thought to arise in context of threatening situations that resulted in an intense emotional experience that was then translated or "converted" into a physical expression of symptoms (Kozlowska, Scher, & Williams, 2011). Initially, it was not well understood how and why strong emotions produced conversion symptoms, or why some people were more susceptible to developing them than others. During the 21st century, advances in technology made it possible to use neuroimaging techniques, which advanced research in this and many other medical science fields. This allowed scientists in the fields of neurobiology and information processing to investigate conversion symptoms from new perspectives, including study of the role of sensorimotor, cognitive, emotional, and motor processes (Black, Seritan, Taber, & Hurley, 2004; Vuilleumier, 2005).

While research has not determined that any one of these processes alone results in conversion symptoms, interconnections *between* these processes likely contribute to conversion disorder presentations. For instance, research has shown that distressing feelings can result in neurological activity that changes sensorimotor processes (Kozlowska et al., 2011). Clinically, this explains how a stressful situation could trigger a process of neurological activation that results in symptoms such as gait impairment. Cognitively, children with conversion symptoms have been found to demonstrate deficits in executive functioning tasks, memory, and attention (Kozlowska et al., 2015). Conversion symptoms also can be triggered on an arousal, hormonal,

autonomic, or cardiovascular level. For instance, children with conversion disorder have been found to have higher arousal, a greater startle reflex, and inability to habituate compared to healthy children (Kozlowska et al., 2011). Similarly, children with nonepileptic seizures had lower heart rate variability and increased cortisol levels compared to healthy controls (Bakvis, Spinhoven, & Roelofs, 2009). In sum, this research shows that it is more than just an emotional process that drives the development of conversion symptoms.

In addition, research has examined the role of physiological and autonomic arousal in children with other somatic symptoms. Children with psychogenic movement disorders, nonepileptic seizures, and syncope have intensified physiological responses in situations associated with a perceived threat compared to healthy peers (Kozlowska et al., 2011). In addition, the autonomic nervous system and limbic hypothalamic–pituitary–adrenocortical system have been shown to be hyperresponsive to stressful events in children with somatic symptoms (Gunnar, Bruce, & Hickman, 2001). Increased physiological reactivity also has been associated with internalizing symptoms during childhood (Bauer, Quas, & Boyce, 2002; Boyce et al., 2001). Children experiencing impairment related to somatic symptoms may also have an increased focus on both internalized physical *and* emotional symptoms (Beck, 2008).

There are many identified biological factors associated with chronic pain syndromes, as well. Specifically, neurological processes including functional differences, structural changes, and attention play significant roles in pain perception. Regarding functional factors, while traditional theories of neurological pain perception focused solely on the somatosensory cortex, functional magnetic resonance imaging (fMRI) technology has enabled the discovery that pain perception occurs in many areas of the brain (Coghill, Sang, Maisog, & Iadarola, 1999), which expand over time as the brain continues to experience pain in a process called central sensitization (Woolf, 2011). Abnormal changes in pain pathways and sensory processing have been found to affect both the initiation and maintenance of chronic pain conditions (Diers et al., 2008). Simply put, the more pain the body feels, the more areas the brain recruits to think about it, which increases the overall perception of pain.

Neuroimaging work in children with chronic musculoskeletal pain has shown that there are also structural changes associated with chronic pain in some brain areas, such as the amygdala, which can be reversed through integrated therapies (Simons et al., 2014). fMRI research in children with IBS demonstrated both structural *and* functional changes in the brain compared to healthy children, and these changes related to pain intensity and functional impairment (Hubbard et al., 2016). Finally, research on attention has shown that some people seem to be biologically wired to attend to pain, thereby increasing the amount of pain felt, whereas others are biologically wired to attend *away* from pain (Legrain et al., 2009). Overall, research shows good evidence that chronic pain is a real, true signal produced by structural and functional changes in the nervous system and attended to differently by some people than others that can be changed through treatment.

In sum, research demonstrates that there are biological factors underlying somatic symptoms. This evidence has significantly advanced the thinking about and understanding of somatic symptoms, enabling us to go beyond the initial assumptions of

"it's all in their heads" to realizing that biological factors *do* play a role in somatic symptom presentations, although they may not be the "easy" factors to identify through standard medical testing. How to explain these biological contributions to somatic symptoms to children and families in the clinical sense is reviewed in Chapters 3 and 5.

Psychological Factors

Psychological factors and coping ability also play a strong role in the development and presentation of somatic symptoms. Theoretically, the cognitive-behavioral model posits that the symptom experience results from an interplay between cognition, emotion, and behavior in response to or in association with symptoms (Beck et al., 1979; Lazarus & Folkman, 1984), whereas psychodynamic theory assumes symptoms are unconsciously produced from a desire to avoid a situation or inability to express distress (Husain, Browne, & Chalder, 2007).

Anxiety and depression do not always preclude somatic symptom development. There is some evidence for anxiety and depressive symptoms predicting the development of somatic symptoms; however, further research is indicated to better understand the exact nature of this connection over the lifespan (Campo, 2012). Overall, there is variation in somatic symptom presentation, course, and outcome in terms of the association with psychological factors; there is not consistent evidence for specific psychological risk factors related to the development or trajectory of somatic symptoms (Beck, 2008). Clinically, psychological factors associated with somatic symptoms must be accounted for, though do not assume that children will have a more or less difficult course based on the presence or absence of comorbidities.

Regarding research on specific somatic symptoms, investigation into the role of cognitive and emotional processes in children with conversion disorder revealed two patterns: employment of cognitive inhibition to manage strong emotions (i.e., masked their emotions) and development of "exaggerated" responses that resulted in getting comfort from caregivers (i.e., overshowed their emotions; Kozlowska et al., 2011). In this way, extreme forms of emotional expression have been associated with functional neurological symptoms. These processes occur on a subconscious level, but associations are built over time and the body and mind learn that symptoms allow escape in situations with high levels of perceived threat. In providing treatment, the goal is for children to unlearn this connection that has been reinforced.

Among children with syncope, children with a history of unexplained fainting had higher rates of internalizing symptoms than children without a history of fainting (Byars, Brown, Campbell, & Hobbs, 2000). In adults with syncope, despite similar reports of psychological distress, those with unexplained syncope (i.e., who did not have symptoms on the tilt-table test), reported greater perceived distress than those with a positive tilt-table result (Rafanelli, Gostoli, Roncuzzi, & Sassone, 2013). Another study of adults with syncope showed an overall high rate of psychological distress, including anticipatory fear of syncopal episodes and negative consequences of fainting, which led to severe disability (McGrady, 1996). These types of psychological stressors likely fuel the arousal of physiological changes that underlie cardiac

symptoms. In that sense, this process can be viewed as a self-fulfilling prophecy: just *thinking* about the feared event produces enough physical arousal to actually make it happen. It is important to teach children with syncope or any type of cardiac-based somatic symptom about these connections between psychological and physiological states, as it will help them understand why strategies for both responses improve symptoms and impairment.

Another psychological factor that is highly relevant in its contribution to the onset and maintenance of somatic symptoms is coping. Coping can be defined as a process that includes the thoughts and actions used to manage demands of situations that are perceived as stressful (Lazarus & Folkman, 1984). There are many theories of coping and ways to categorize coping responses. For example, coping responses can be voluntary (e.g., goal-directed behavior) or involuntary (e.g., change in heart rate), emotion focused versus problem focused (e.g., "I cannot handle this" vs. "There is nothing I can do"), engaging versus avoiding, and repressive versus sensitizing (Blount, Davis, Powers, & Roberts, 1991; Compas, Connor-Smith, Saltzman, Thomsen, & Wadsworth, 2001). Across all definitions, both cognitively and behaviorally driven coping responses to stress have been found to affect children's adjustment to somatic symptoms overall.

In a study of children with abdominal pain, passive coping efforts were most strongly associated with high levels of somatic and depressive symptoms compared to active or accommodative strategies (Walker et al., 1997b). In other words, children who elected to rest or retreat or who felt defeated in the face of symptoms were the most likely to continue struggling. This finding has been replicated in children with chronic pain syndromes: more active coping styles and fewer catastrophic thoughts and actions in the face of pain were associated with less impairment and better psychological outcomes (Vervoort, Goubert, Eccleston, Bijttebier, & Crombez, 2006). Overall, what children think and feel in response to their symptoms relates to their overall adjustment; research supports the adoption of an active coping style and resilient thinking pattern to improve children's experience with all types of somatic symptoms.

Finally, while some case examples have suggested that there is a common personality type among children with somatic symptoms (e.g., perfectionistic or "Type A"), systematic, population-based research has not found a specific personality type consistently associated with somatic symptoms. Participants in a retrospective study on nonepileptic seizures completed personality inventories, and the most frequent personality traits identified were inhibited, submissive, and introverted, consistent with other research in the field of coping indicating a more passive/avoidant coping style among children with somatic symptoms in general (Plioplys et al., 2014; Sawchuk & Buchhalter, 2015).

Social Factors

In addition to the influence of biological and psychological factors, social and contextual factors also contribute to somatic symptoms, including modeling of illness behavior in the family as well as exposure to adverse events at home or school (Beck,

2008). Behavioral theory explains how contextual factors influence somatic symptom presentations. For example, through classical conditioning, children can acquire conditioned responses to initially neutral stimuli, and through operant conditioning, behaviors are reinforced if followed by pleasant consequences or the successful avoidance of unpleasant consequences (Skinner, 1953). Social learning theory provides explanations for how social influences contribute to symptoms, such as the modeling of a family member whom the child sees receiving attention or reinforcement for symptoms (Bandura, 1986). And finally, structural models focus on how the family environment is involved in the development and maintenance of symptoms, illustrating that all people—especially children—rarely function alone and are influenced by the larger system; if something in the system allows the symptoms to happen or the system benefits in some way, symptoms will be more likely to persist (Minuchin et al., 1975). Thinking in these behavioral and systemic terms allows you to consider assessing and intervening with challenges a child may be facing in the family, school, or peer environment.

In general, stressful social–environmental factors, including school difficulties (e.g., starting/changing schools, poor academic performance), difficulty getting along with peers and teachers, and bullying, are associated with high somatic symptom reports among children (Due et al., 2005; Eminson, Benjamin, Shortall, Woods, & Faragher, 1996; Taylor, Szatmari, Boyle, & Offord, 1996). In one study, children's most common life stressors were identified as peer insecurity, family conflict, learning difficulties, and bullying (Sawchuck & Buchhalter, 2015). Stressful life events can negatively impact symptoms: children with higher levels of impairment from abdominal pain were those who had experienced more negative life events in the past year (Walker & Greene, 1991b).

Although there is some evidence from retrospective adult reports of somatic symptoms and a history of childhood abuse or trauma, it is difficult to demonstrate the same links concurrently in childhood and adolescence (Eminson, 2007). Certainly among children who have been through abusive situations, there is often somatic symptom involvement (Friedrich & Schafer, 1995); however, research does *not* suggest that the reverse is true, and there is not support for the notion that a majority of children with somatic symptoms have been abused. Although it is important to assess for trauma history when meeting children with somatic symptoms, as in any psychological intake, it is not considered as a primary associated concern.

Overall, research has shown that biological, psychological, and social factors interact to produce and maintain somatic symptoms. This evidence base lends support to the importance of the biopsychosocial model in understanding and treating somatic symptoms, addressed in the next chapter. Throughout the book, keep in mind that there are always unique differences and individual factors that contribute to each child's symptom presentation. This is consistent with research on individual responses to stress. While this theoretical and research review focused mainly on the negative biopsychosocial aspects of somatic symptoms, there are also areas where children may show positive qualities. Two children may undergo the same stressor, but one is back at school the next day and the other is in bed with a stomachache. There is resiliency in addition to pathology; it is as important to understand the areas where children *are not* doing well as it is to understand areas where they *are* succeeding.

MYTH BUSTING

There are many providers in the health care and therapeutic fields who wonder about the "realness" of symptoms or the legitimacy of somatic symptom disorders. It is a natural response to question a new concept when first learning about it, particularly for a construct that is gray and murky at best. Discussion of what somatic symptoms *are* is just as important of what somatic symptoms are *not*.

In this chapter, the ways in which somatic symptoms are real have been identified and supported through the scientific literature. Children do have pain and they do feel dizzy. They do experience leg paralysis and gait imbalance. They are not intentionally producing symptoms and the symptoms are involuntary. No matter the cause, *the child has the symptoms*. Skipping ahead to the treatment section, it would be evident that regardless of what is causing the symptoms, everyone's focus, especially the mental health provider's, is to return children to normal function. Ultimately, this is what makes any physical symptom better and easier to cope with. This is true whether a child has a gait disturbance related to conversion disorder with no associated injury, or a gait disturbance related to chronic pain from a (now-healed) broken ankle. It is true whether a child has syncope that was diagnosed via tilt-table test with orthostatic signs and treated with medication, or a child who did not demonstrate clinically significant cardiac changes but continues to experience dizziness. And it is true for a child with nausea and abdominal pain that arose after a nasty viral infection but never went away, as it is for a child with anxiety who throws up each morning before school with no such infectious history.

When questioned by colleagues who wonder about working with children with somatic symptoms, we say, "We work with children with medical problems that are real, but are not from diseases, to help them understand their symptoms and learn coping strategies to get back to their lives." In going beyond questioning the reality of symptoms, accepting that they are real, and understanding the related factors that affect children's lives, a mental health provider can help children overcome *both* the symptoms and impairment.

Despite the very best descriptions of somatic symptoms and efforts to explain this type of intervention, at times it is hard for parents, health care professionals, and even other mental health providers to believe that children are not producing these symptoms on purpose. Sometimes the message conveyed to children and families is that the referral to a therapist is being made because the symptoms are believed to be "all in your head." Unfortunately, this sets mental health providers up for failure, as they are not any more in control of the symptoms than the child. Usually, the idea that somatic symptoms are made up or untrue is due to confusion between malingering and secondary gain. It is important to address these myths about somatic symptoms, as they out there in the public consciousness. The majority of children with somatic symptoms do not falsify symptoms, but there can be secondary gain in symptom reinforcement.

Malingering/Factitious Disorders

In some circumstances, it can be the case that children are not actually experiencing the symptoms they are reporting, but are in fact making up their symptom

presentation. By definition, a factitious disorder is the falsification of medical or psychological symptoms where the person is taking deliberate action to misrepresent or actually cause illness or injury to him- or herself (or others, as in Munchausen syndrome by proxy) in order to satisfy a need, such as the need for attention or nurturance (American Psychiatric Association, 2013). Malingering, while not classified as a psychiatric disorder, shares the same definition as factitious disorder, with the addition that symptoms are reported primarily for personal gain or reward. While there is no methodologically sound way to estimate the incidence of self-induced factitious disorders or malingering in children, the clinical opinion is that it is uncommon in clinical settings (Bass & Halligan, 2014). Because the evaluation of illness falsification requires careful behavioral analysis using medical records, it is a time-consuming and challenging task that is rarely pursued. It is recommended that clinicians believe children's symptom reports unless there are warning signs present that require further evaluation. Children who falsify illness in themselves are also distressed and require a biopsychosocial treatment approach for recovery, similar to children with somatic symptoms. Additionally, it's possible for these disorders to coexist. Finally, children with either diagnosis may have a parent who interferes with care to such an extent that a suspected child abuse report is required.

Unintentional Secondary Gain

It is not a key feature of somatic symptoms that children seek secondary gain based on their symptoms. However, it is certainly the case that this *unintentionally* happens. For example, a child with multiple symptoms (nausea, vomiting, fatigue) may discover that her parents fight less when she is in the hospital; thus, while the child may not *make* herself vomit to the point of hospitalization, she is reinforced for having symptoms because of the family harmony her illness achieves. In this way, bodily responses can be unintentionally classically conditioned.

Sometimes, when these patterns are noted, it is suggested that perhaps children are making up their symptoms or getting sick "on purpose" in order to receive the benefit that has been identified. Acknowledge that while these secondary gains and reinforcement patterns exist and may maintain the symptom presentation, they are not the sole reason for the symptoms in the first place and the child is not producing symptoms intentionally. Children with somatic symptoms often have an extremely high, sustained degree of symptoms and impairment; it is not our experience that children sit around plotting their next distressing malady just so they can stay home and get that new video game they have been wanting. The impact of somatic symptoms on family relationships and children's behavior is reviewed in Chapter 9, as are strategies parents can use to uncouple these associations and form a healthier pattern of interaction with their children.

CHAPTER SUMMARY AND TAKE-AWAY POINTS

- Somatic symptoms are common in primary care and specialty care settings and are seen in every body system. They are common among school-age children 6 to 18 and happen in both boys and girls in

childhood, with higher incidence in adolescent girls. Somatic symptoms are impairing and associated with psychological distress and high levels of health care utilization.

- The most common somatic symptoms include headache, fatigue, dizziness, aching muscles, limb pain, nausea, abdominal pain, and neurological symptoms (e.g., changes in eyesight, balance, sensation, or gait). Somatic symptoms are real, they are not intentional, and they are involuntary.
- Theory and research demonstrate that somatic symptoms are produced and maintained by the contribution and interaction of biological, psychological, and social factors.

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