

Stressors, Stress, and Distress

Getting past the surface

There are a few lucky people who seem to float through life, largely unaffected by the aggravations and hardships that others so often endure. They've got terrific jobs, a nice home and fancy car, a summer cottage, and a stash of cash based on investments made on their behalf starting the day they were born. They attend top universities, run in the best social circles, and have loads of good friends and alliances. We envy these luckiest people in the world, and might even delight when, on the odd occasion, they actually do suffer a setback, and we don't feel the least bit guilty about this *schadenfreude*. Yet, if you were to look beyond the surface, you might find that their lives aren't dust-free and they're not immune from life stressors. They might have multiple problems, including family and health issues, financial problems that are being covered up, children with a huge sense of entitlement, and they suffer the same diseases that other people do. I don't mean to make anyone feel sorry for the members of the country-club set who happened to have hit a few road bumps, nor do I want to compare their problems to yours. Instead, the point is that although life is hard for lots of people, but pretty sweet for others, at least on the surface, virtually everyone will encounter challenges that scar them. In dealing with our own problems, it's not profitable to look around to see how much better anyone else seems to have it.

What this book is about

When you encounter stressors, particularly those that are fairly disturbing, do you fret, get overly emotional, or get stuck in neutral just hoping everything will get better, eventually? Or, do you look at the situation logically and make efforts to solve the problem? The two aren't mutually exclusive, although for most individuals emotional reactions tend to occur more readily in response to stressful situations. In general, there isn't a right way or a wrong way to deal with stressors, since the best method often depends

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on the specific situation in which we find ourselves. However, using ineffective or counterproductive methods of dealing with stressors will usually result in our load getting progressively heavier and it might eventually increase vulnerability to any of several psychological and physical disturbances.

Whether it's heart disease, cancer, diabetes, or any of a number of psychological disturbances, there's a premise that holds true: the longer it goes untreated, the further the illness will progress, and the more difficult it will be to treat. Like physical wounds, those of a psychological nature will fester, and early detection and treatment is essential. Better still would be to preemptively intervene in the processes that lead to disease. My intention with this book is to provide information regarding the multiple processes that

Good thing you were here or I might have been far off track

When it comes to politics, fixing the economy, and the state of international relations, many people believe that they have some special insights, and that everyone ought to be sharing their opinion, and if you don't then you're obviously ignorant. This also seems to be true of stress processes and the relationship between stressful events and the development of illnesses. When they learn that I work on stress processes, some people feel compelled to offer me advice about what sort of research I should be doing, how it should be done, and why the approach I've been taking is way off base and even irrelevant. It's even come from a (non-blood) relative who suggested that "we need to separate ourselves from our brain, and think on a higher plain." I have no idea what that meant, but this was the same guy who was near apoplectic when I disagreed with his contention that we use only 10 percent of our brain. This notion has been around for a long time, and somewhere there must have been a teacher who started this widely disseminated and readily accepted myth. With the analogy to an iceberg in which only 10 percent is above the surface, that teacher likely influenced views of brain functioning to a greater extent than have 99 percent of neuroscientists.

Of course, all these stress experts are also competing with the advice concerning stress and coping offered by magazines in the waiting room of your doctor's office or at the checkout stand at the supermarket – 10 fast and easy steps to rid yourself of stress; 12 ways of coping with a cruddy relative; 34 ways to find balance; the 17 best ways of getting rid of bad karma, and contacting your inner self. I haven't seen it yet, but I'm anticipating "Want to feel better? – 81 ways to get even with the people you don't like." I'm really not all that down on self-help advice obtained from magazines, but it strikes me as odd that anyone would use this sort of advice to deal with stressful events. Given the health burden that can be created by stressful events, it's too important a matter to rely on advice offered in a magazine article written by someone who spoke to someone who sat on a bus beside a self-proclaimed expert in the field, possibly my non-blood relative. If you had a suspicious lump in your breast or fairly severe chest pain that radiated down your left arm every time you exerted yourself, would you rely on one of these magazine articles for treatment options? They might have some great cooking recipes, but don't rely on them for ways of coping to minimize distress.

influence the impact of stressors on well-being, after which we'll consider factors that can minimize the negative effects of stressor experiences. In this regard, we'll examine the right steps that ought to be taken at the first whiff of danger, thereby minimizing the negative impact that would otherwise occur. Moreover, we'll consider what can be done to limit the psychological and physiological disturbances that could emerge in response to various chronic challenges. The information provided is based on well-controlled research concerning the actions of stressors. As there's also a fair bit of incorrect information that gets passed around, as we go we'll also dispel some of these myths.

What do we mean when we talk about stressors?

Although it's often thought that stressors will have negative effects, this isn't always the case. In some instances, stressors may, in fact, cause us to be alert and ready to deal with events that could potentially cause harm, they can promote biological changes that facilitate coping, and they can facilitate learning about how to engage subsequent stressful events. In essence, our cognitive and biological systems help us deal with immediate challenges, and these experiences may leave us better equipped to deal with further insults. One issue that needs to be dealt with is how to know under what conditions stressors can have positive effects, and under what conditions do they cause damage? Answering this can be difficult, and there isn't a single rule that can guide us in relation to all situations or for all individuals. Among other things, the effects of stressors depend on when in the course of a person's development they occurred, and their effects can be modified further by a broad constellation of psychosocial and experiential factors. In some instances, stressor experiences can have transient effects that are soon forgotten. But they can also have far-reaching consequences, potentially marking us for decades, and as we'll see, some stressor experiences can even have intergenerational consequences, affecting our children and their children.

What we know concerning the impact of stressors has come from research conducted in both humans and animals (mostly rats and mice). Of course, the effects of various stressors and other manipulations in animals aren't always generalizable to humans, so interpreting the findings from animal studies and applying them to humans isn't simple or straightforward. Later, we'll consider when it might or might not be appropriate to make these generalizations, but for the moment the information will be presented with only occasional warnings about their relevance or meaningfulness.

Stressors, as most of us have discovered, can come in several forms. They can be purely psychological (sometimes referred to as psychogenic) or physical (neurogenic), and they might vary across several dimensions, such as their severity, controllability, predictability, ambiguity, uncertainty, complexity, volatility, chronicity, and intermittence. The response to stressors can also vary with several features inherent to the organism, including the species, strain, race/culture, sex, age, and personality factors, as well as previous stressor experiences, including those encountered prenatally or in early life. Some events or stimuli are appraised as stressors on the basis of our experiences, others are innately driven, such as predator odors. Innate and learned stressors can activate diverse neurobiological circuits and might thus have repercussions that are distinct from one another. Thus, pathological conditions brought on by one or another type of stressor might call for different remedies.

We typically don't think of viral or bacterial challenges as being stressors, and their actions are in many ways very different from those elicited by psychological or physical challenges. We don't appraise these "systemic" insults in the same way as we might

What's a stressor?

So that we're all working from the same playbook, let's define a few terms and concepts. A "stressor" is a stimulus or event that is appraised, judged, or perceived as being aversive and which causes a "stress response," which is often referred to as "stress." There isn't actually "a" stress response, but instead there are many stress responses that comprise cognitive, behavioral, and biological changes. These stress responses have multiple adaptive functions, helping us deal with and diminish the negative effects of the stressor. For instance, biological stress responses that occur in the brain may guide our appraisals of stressors and facilitate the adoption of appropriate coping responses, and they also act to direct energy resources toward places they are needed (e.g., muscles, so we can run from danger) and away from processes that are not essential at the moment (e.g., reproduction, eating, digestion). The term "distress" in this book refers to the biological and psychological states or responses that evolve as a result of a failure to adapt to stressor events.

There have been occasional discussions as to what constitutes a stressor. Is jumping out of a plane a stressor for an experienced skydiver given that some of the biological responses elicited are reminiscent of the stress response seen in other stressful situations? Frankly, I don't have the patience or interest in these largely academic discussions that are often boring and have no resolution. Instead, I often fall back on US Supreme Court Justice Potter Stewart's comment in dealing with the definition of pornography, "I can't define it, but I know it when I see it" (*Jacobellis v. Ohio*, 1964). Even this isn't entirely accurate in relation to stressors, but it shuts down debates that I don't want to get into. The essential issue is that what constitutes a stressor is highly subjective; what I see as being stressful might not be something you see in the same way.

There's also the issue of whether or not something can be stressful if we aren't consciously aware of its presence. There are, as we'll see, a variety of environmental challenges, including bacterial or viral infection, that can instigate biological stress responses, just like those elicited by psychological challenges, without our being aware of their presence. Likewise, stressors that we experienced as infants, even if we have no recollection of them, can have lasting repercussions and can affect responses to stressors encountered many years later. This challenges the often used definition that a stressor is something that is "appraised, judged or perceived to be aversive." So, unlike the pornography that Justice Stewart recognized when he saw it, there are occasions where stressors can elicit their effects even when they're unseen or unrecognized.

appraise psychological or physical stressors, and often we are unaware that our body has been infiltrated by these invaders. Yet, through their effects on brain neuronal activity, systemic challenges that involve activation of our immune system can affect cognitive processes and mood. Just as the pain elicited by a neurogenic stressor, such as a sprained ankle, makes us cautious and protective of the injured area so that the tissue can heal properly, we're blessed with a very clever adaptive network wherein the brain knows about the presence of a systemic challenge, such as the presence of a virus, well

before we actually become sick, so that we can behave in ways, such as slowing down, to preserve energy that will help us deal with symptoms that might be just around the corner.

Stress responses can arise as a consequence of an event that has already occurred, such as the termination of a romantic relationship, loss of a loved one, business failure, natural disaster, or being ostracized by your previous best friends. Stressors of this sort often diminish us, even if they do so in different ways, and in some instances may give rise to intense depressive mood. Other stressors, in contrast, don't reflect events that have already happened, but instead concern anticipated events, such as impending surgery, having to speak in a public forum, or even the fear of encountering the bully in the school yard or in the workplace. These anticipatory stressors are usually accompanied by anxiety, and if they go on long enough or are sufficiently severe, depressive mood might also arise.

The characteristics of stressors: comparing apples, oranges, and lemons

What makes some stressors appear relatively modest, whereas others are so severe that they are incapacitating? Although this seems like the type of question that can readily be answered, it's actually fairly complex given the broad constellation of factors that ultimately determine how a stressor affects us. The perceived severity of a stressor is, of course, closely related to the development of pathological conditions, but focusing on this alone is simplistic, and a direct linear relationship might not exist between the severity or intensity of a stressor and the negative consequences that follow. Besides, stressors come in many forms and vary across multiple dimensions, making it exceptionally difficult to define which stressors are more severe than others. How does one compare the negative attributes of illness, loss of a loved one, severe shame and ostracism, or the fear of harm coming to one's children? These stressors are different across so many domains that they can hardly be compared to one another, and there likely isn't much value in doing so.

As we're on the topic of stressor severity, let's also consider that it isn't just relatively severe stressors that have negative consequences. Day-to-day hassles frequently create considerable strain for some individuals and their impact shouldn't be underestimated. When there are enough of them, especially when they're superimposed on a backdrop of major stressors, they can be especially damaging. Many of us know the feeling of trying to deal with some fairly intense stressor only to be subjected to some trivial event that needs to be dealt with so that our resources have to be redirected to where they need to be. Unless we're able to compartmentalize emotions and issues, we might find our abilities to deal with important issues to be disturbed.

One of the most cogent factors concerning the impact of stressors concerns their perceived controllability. In studies conducted on animals during the 1960s and 1970s, Maier and Seligman (1976) revealed that stressor events that the animals could bring to an end by making particular responses did not have particularly negative effects on later behavior. However, animals exposed to a stressor that was identical, except that its termination was not under their control, subsequently demonstrated profound performance impairments when they were tested in a situation where they could escape from a physical stressor. These animals seemed to accept the stressor passively, exhibiting few efforts to escape. They were thought to have formed the cognition that "nothing I do matters," which essentially amounted to learning that they were helpless in controlling

their own destiny, and hence they gave up efforts of trying to escape. These uncontrollable stressor experiences had several behavioral consequences beyond simply affecting the animal's motivation or ability to escape from other stressors. Among other things, these animals displayed disturbed social interactions, with a diminished capacity to obtain positive feelings from stimuli or events that would otherwise have been interpreted as rewarding or pleasurable. It may be particularly significant that if animals were first trained in a situation in which they could determine outcomes, essentially learning that "I have control over this situation," then later uncontrollable stressor experiences did not lead to behavioral impairments. From a clinical perspective, these findings suggest that if individuals had the cognitive mindset established that control over events was possible, this would immunize them against the adverse actions that might otherwise be imparted by later uncontrollable events.

It's unfortunate that we might find ourselves in situations where we have limited control over our destinies, which could potentially result in feelings of helplessness. At the extreme, no doubt, are the experiences of those caught up in wars where they could do little but suffer as they and those around them were victimized. We've recently seen this happening in Syria, Sudan, and the Congo, and we've been witness to the establishment of concentration camps that were used for acts of genocide. Although these are instances outside of the norm of usual human experiences, many of us encounter relatively common stressors that could leave us feeling helpless. Consider, for instance, the dehumanizing experiences associated with intrusive medical procedures and severe illnesses, the distress created by natural disasters that range across floods, hurricanes, tornadoes, and earthquakes, or the distress caused by repeated bullying or experiencing repeated discrimination. Equally disturbing, but creating different types of emotions, is the distress that comes from watching the demise of a parent through dementia, or being unable to prevent the death of a child through cancer.

Beyond the severity and controllability of a stressor, the impact of a stressor on well-being is also influenced by its predictability. The occurrence of some stressors is perfectly predictable. University students know that when exam time rolls around they'll be feeling stressed, accountants know that March is going to be a hectic time, and when you've got an appointment at a colonoscopy clinic you know it's not going to be a picnic (maybe that isn't the best choice of words), but in each instance you have the opportunity to prepare yourself. There are, in contrast, occasions when the occurrence of stressors is entirely unpredictable, and our responses in these situations are likely to be quite

Going to the happy place

Oddly, I'm reminded of my youngest kid's experience of uncontrollability, saying "I hate school! I don't wanna go anymore. I just sit there ... bored ... It's my life, you know, and I don't have any control, or choice, or anything." His older brother then interjected with "You're going! You don't have a say in the matter. You just go! – Don't you get it? You're not in charge when you go to school. They're in charge and you just do what you're told. In fact, you're not supposed to like school. That's why they call it 'school'. If they wanted you to like it, then they'd call it 'the happy place.'" Somehow, that seemed to make a lot of sense.

different. Some of these stressors are somewhat unpredictable, such as being in a traffic accident and suffering a couple of bruises. I say that they're *somewhat* unpredictable as accidents happen all of the time, but there aren't warning signs that tell us that "today's the day." Other trauma events are far more devastating and are entirely unpredictable. Who could have predicted 9/11, or earthquakes, tsunamis, or the floods secondary to hurricanes in New Orleans or New York? As the well-known expression goes, "It's difficult to make predictions, especially about the future."

Let's look at yet another instance concerning unpredictability in relation to stressors. In Canada, where there is socialized medicine, an individual might need to have surgery to deal with a problem, such as a herniated C6 disc that creates considerable pain. However, the wait-list for most non-emergency conditions is invariably long, sometimes exceeding a year. So the surgery, which is distressing to say the least, will happen; however, it's unpredictable when this will happen, and aside from fretting, all that can be done is gobble Percocet (a combination of oxycodon and acetaminophen) for pain control, despite the high risk for addiction. Few among us care for this sort of suspense, and if given the option most people would choose to deal with predictable rather than unpredictable stressors. However, it is also the case that knowing precisely when an event will occur allows for anxiety to build up as the due date approaches, and so there are individuals who might choose unpredictability.

Predictability and unpredictability refer to events that will almost certainly occur, but we might not know when the event will occur. So, for instance, we know that we will die some day (it's an inherited characteristic!), but most often we don't know precisely when this will happen. It's unpredictable. Uncertainty is related to unpredictability, but it is usually considered in the context of events that might or might not occur (e.g., it's uncertain whether a particular flu virus will be transmittable between humans, and whether it has the potential to kill large masses of people). Once again, certainty promotes or allows for preparatory responses, whereas uncertainty might leave us in limbo, not sure if we should be engaging in particular behaviors to ward off the threat or whether this would simply comprise pointless action. As there isn't a certainty that the event will happen, we can fall back on the hope that it won't occur, providing us with a ray of hope in situations that are otherwise bleak, as in the case of individuals who are experiencing an illness that is usually fatal, but there is a chance of recovery, however small.

The brain abhors a vacuum

What happens to brain functioning when situations are either uncertain, ambiguous or unknowable? When brain activity was assessed under conditions that involve various levels of "knowability," neuronal activity in portions of the frontal cortex associated with executive functioning, such as planning and decision-making, markedly increased as the ambiguity and uncertainty of the situation increased. Essentially, the brain doesn't like ambiguity, and works hard to make sense of uncertain situations. One wonders, however, whether in filling in the blanks when insufficient information is available, the brain is actually making correct guesses or confabulating with any information that happens to serve the purpose.

Individuals differ appreciably in their intolerance of uncertainty, a characteristic (trait) that individuals bring into situations. Those who are relatively intolerant of uncertainty tend to display elevated levels of anxiety and distress in response to uncertain daily stressors, and express the desire to reduce uncertainty through persistent information-seeking in an effort to obtain factual certainties. Other individuals seem better able to cope with uncertainty, expressing the attitude of “whatever happens, happens.” We sometimes see these characteristics in the context of a particular gene or gene mutation (variant) that increases the probability of developing an illness but doesn’t guarantee that the disease will actually emerge. Women of certain ethnic groups (e.g., Eastern European Jewish women of Ashkenazi descent) are at increased risk of developing breast cancer owing to the increased inheritance of BRCA1 and BRCA2 gene mutations. Thus, if they had a close relative with this disease, increasing the odds that they too carry this gene, the person might not want to live in suspense, waiting for the shoe to drop, and might thus go for genetic testing to determine if they carry one of these mutations. If the tests are positive some women opt for a double mastectomy and ovariectomy to preclude the possibility of developing breast or ovarian cancer. Others, in contrast, even with a family history of the disease, might choose not to be tested. They prefer not to know and are seemingly able to vanquish these thoughts so that their daily routine is not affected.

Ambiguity, like its cousins, unpredictability and uncertainty, is a further characteristic of stressors that determines how powerful they can be. A situation is said to be ambiguous when there’s insufficient information available concerning the probability of an event occurring, or when multiple but inconsistent bits of information are available regarding a potential threat. For example, discomfort can arise as a result of a set of suspicious symptoms that don’t form a pattern that is sufficiently coherent to allow for a firm illness diagnosis. Likewise, most of us have heard that government agencies are on the alert for a terrorist attack when they encounter increased internet chatter, or when certain individuals or groups have suddenly dropped off the grid. However, these cues are vague and don’t give sufficient information about what might be happening, and hence they are especially potent in creating anxiety.

Reluctant symptoms

Cars sometimes make odd noises that seem to come and go. Computers often misbehave in a similar manner, first showing and then not showing puzzling characteristics. Often the symptoms disappear when you visit the auto mechanic or get the IT technician to look at your computer. Sometimes the same type of thing happens regarding chest, head or stomach pains. Frustratingly, the medical tests come back with a series of inconsistent results, or results that suggest that there’s nothing wrong with you and you’re viewed suspiciously as if you’re either very neurotic or a candidate for a diagnosis of Munchausen’s Syndrome. This isn’t uncommon and people are frequently sent home after visiting a hospital emergency room having been told that there’s nothing wrong with them, when in actuality they’re in a perilous condition. Of course, within an hour or so after leaving the hospital, the symptoms re-emerge, and you might wonder whether dropping dead will be the necessary clue to convince the doctors that there is, in fact, something amiss.

Both ambiguity and uncertainty occur frequently and many of us will have experienced the anxiety elicited by such events. For example, if you're over 60 then you may already have had medically related experiences where you're simply unsure what you should be doing. "This feeling in my chest seems like indigestion, but it might also be a heart attack. What do I do now? Do I rush off to the hospital and potentially make a fool of myself if it turns out to be a false alarm, or should I just sit here and hope it passes?" Often these experiences are "just" false alarms, and when the symptoms disappear we likely forget about them. If they reappear, we might then have tests done, and there are occasions where these tests yield distressing outcomes (oddly, the statement that "the test turned out to be 'positive'" is actually bad news). This is accompanied by considerable distress, including uncertainties pertaining to the illness prognosis, and the availability of a competent and experienced medical practitioner (Does this doctor have the experience and skill that will be needed or is he or she a new graduate who had to repeat the module on the kidney after figuring it wouldn't be on the exam?).

Some events that we encounter call for particular measures to be taken fairly quickly. If you feel pain in your chest or a suspicious lump upon a breast examination, then it's obviously advisable to seek medical attention. Other events, however, comprise much greater complexity, and as the situation plays out, uncertainty and unpredictability might increase rather than diminish. We simply can't get a grip on the situation; the chess pieces seem to be moving every which way, and finding a path through the phalanx becomes baffling. When we encounter complex situations of this sort, some individuals simply abandon active efforts to change things, letting fate decide outcomes. For some, this strategy is the worst of all worlds, even as we're being pushed by an inner voice saying "do something, anything, just do something." As we'll find in discussing decision-making processes, we have specific strategies that we use in these situations, although sometimes they're not particularly effective.

Related to some of these stressor characteristics is the volatility of a stressful situation, essentially meaning the extent to which the situation is unstable. Some stressors we meet tend to move along, getting somewhat better or somewhat worse, but generally following along a given trajectory. Other stressor conditions are more volatile, exploding suddenly in unexpected ways, or changing rapidly over time, making it difficult to adjust to or cope with the situation. Obviously, these situations require individuals to be nimble and able to change coping strategies readily.

Many of us seem to have a need to feel as if we're in control of our destiny. In fact, we might even go so far as to delude ourselves into thinking that we have control under conditions in which we most certainly don't. Most of us also behave as if life is predictable, and so we plan for the future, as we should, and act as if we can reasonably anticipate what's in store for us. Typically, we can make some fairly informed decisions about the future, often ignoring the possibility that our beliefs about the predictability and controllability of life events are actually illusory. It's not for nothing that we have expressions such as "mann tracht und Gott lacht," literally meaning "man thinks (plans) and god laughs" or Woody Allen's rephrased version, "If you want to make God laugh, tell him about your plans." We have a need for control, for order and for predictability so that we can operate to make sure our futures are secure and that our expectations and hopes are met. Because of our illusions of control over life circumstances, we might be unprepared to deal with unpredictable, ambiguous stressful situations when they do arise. These might comprise unforeseen challenges that affect us individually, such as being afflicted by rare illnesses or those that aren't rare, but weren't expected. There are also highly unlikely events that can affect people, such as becoming collateral damage when a part of a building suddenly collapses, or being hit by

Optimism bias or plain stupid

Individuals often have a sense of invulnerability (especially younger people), believing that bad things might happen to others, but not to them. In recent studies conducted with Sheena Taha, we observed an optimism bias in relation to severe illness (breast and prostate cancer) as well as in relation to being infected by a potential virus, such as H5N1, at some point in the future. In both instances, participants reported that it was much more likely that members of the general public would contract H5N1 or cancer (54% and 71%, respectively) than they would themselves (32% and 45%, respectively). They also believed that the chances of illness being contracted by their close friends were lower than those of the general population (34% and 50% for H5N1 and cancer, respectively), perhaps reflecting “immunity by proxy.” Interestingly, the individual’s optimism bias was entirely altered if they thought that an acquaintance or family member had contracted the illness. One sees these same optimism biases and the sense of invulnerability in relation to other illnesses, including the development of skin cancer among those spending time in the sun, and lung disease among those who smoke.

lightning, or having a helicopter crash out of the sky. There are also many unexpected events that affect whole communities and countries, including terrorist attacks, wars, nuclear plant meltdowns, hurricanes, famines, and floods. There are even “unknown unknowns” that can affect us. Given the sheer number of potential bullets that might be aimed at us, what are the odds of dodging all of them? Bad things do happen, and as we’ve heard in Robert Kushner’s book published many years ago, they even happen to good people.

Chronic stressors and allostatic overload

Many of the stressors we encounter are blessedly transient and not overly severe, and their effects on our well-being are limited and some of the experiences are quickly forgotten. However, some stressors, as brief as they might be, can have lasting ramifications, especially as the rumination that comes with some stressors can serve as a persistent reminder of negative experiences. By example, being publicly shamed and humiliated can have lasting effects, and it isn’t unusual for individuals to ruminate for lengthy periods, sometimes years, over events that led to these feelings.

The stressors we encounter are frequently chronic, and as aversive as they might be, when they occur on a predictable basis we might be able to find ways to adapt and contend with them, and many of our stress-sensitive biological systems likewise become less reactive. However, when stressors are chronic and unpredictable, occur intermittently, or are ambiguous and uncontrollable, adaptation is less likely, and it is difficult to establish adequate coping methods, or to take preparatory steps that enable effective coping. Persistent stressors, such as acting as a caregiver for a parent with Alzheimer’s or a child with exceptional needs, dealing with chronic illness, or financial problems, may comprise challenges that can change from day to day, thus straining our ability to cope effectively, and our biological coping resources may become overly taxed, eventually culminating in pathological outcomes.

We ordinarily encounter varied conditions that call for behavioral or physiological adaptations so that our internal environment remains stable, a process referred to as homeostasis. For example, body temperature is regulated, in part, by sweating or shivering in response to heat or cold, respectively, and regulatory processes are likewise present to make sure that our biological systems don't fluctuate wildly. To a significant extent, homeostatic changes are fairly slow-moving as the consequences aren't all that great if you sweat a few moments earlier or a few moments later. Many of the biological changes that occur in response to stressors operate on similar principles, but adaptive responses are more urgent and thus occur quickly. This process, referred to as allostasis, involves multiple biological mechanisms within the brain, as well as endocrine, immune, and peripheral nervous systems. As impressive as our adaptability might be, in response to stressors that are chronic, variable and unpredictable, the strain on biological systems may become excessive, resulting in *allostatic overload*, which may increase vulnerability to illness (McEwen, 2007). Another form of allostatic overload, termed "Type 2" allostatic overload, may also develop through more subtle and insidious challenges that comprise sustained social disturbances or social conflict. These social or community stressors can similarly undermine our well-being, unless measures are taken to modify the social structures that support them (McEwen and Wingfield, 2003).

Before you go...

Any number of disasters can befall us, but we really don't expect them to happen, at least not yet, and probably not to us. Yet, the probability of dying of heart disease is about 34% and that of cancer is about 16–17% (although survival has been increasing for several cancers), Type 2 diabetes occurs in about 3.5% of individuals and is climbing, autoimmune disorders occur at 3.1%, then there's kidney, pancreatic or liver disease, as well as serious automobile accidents that lead to severe disability or death. The list goes on and on, and although we don't know specifically how we'll fare in the future, we can pretty much count on not getting away untouched.

Each stressor we experience is different from every other stressor, and how each individual interprets or responds to a stressor is likely very different from how others see or respond to these stressors. Still, there are some features of stressors themselves that can influence their perceived aversiveness. These features, together with personality characteristics and biological sensitivity and reactivity, can influence the potential for pathological outcomes emerging.