The Impact of Trauma on Development and Well-being

Sandra L. Bloom, MD

Why This Matters

If we are committed to Reaching Teens using a strength-based approach that builds resilience, we must be equally as committed to understanding risk factors and the environmental and social forces that drive so much risk. Toxic stress and trauma are key underlying factors that explain much of the behavior we hope to address in order to prepare young people to thrive.

The numbers of youth exposed to overwhelming events during critical developmental periods is astonishingly high and requires us to take a public health approach that focuses on addressing the problems of the young people who have already been affected by traumatic events, building in resiliency skills for those already at risk, and educating everyone.

The American Academy of Pediatrics (AAP) published a sentinel article in 2012 crafted by Jack P. Shonkoff, MD; Andrew S. Garner, MD, PhD; and the AAP Committee on Psychosocial Aspects of Child and Family Health, the AAP Committee on Early Childhood, Adoption, and Dependent Care, and the AAP Section on Developmental and Behavioral Pediatrics that elucidated “The Lifelong Effects of Early Childhood Adversity and Toxic Stress.” It called for action to prevent the experiences in children’s lives that expose them to toxic levels of stress and steps to mitigate their consequences. Most importantly, it recognized that youth-serving professionals had a key role in addressing this issue.

This chapter is written as an orientation to the toll trauma takes on its victims. Chapter 22 will go one step further by discussing trauma-informed practice. It is worth noting, however, that much of Reaching Teens is trauma informed, as it is steeped in recognizing youth as experts in their own lives and recognizes that we are obligated to take the respectful steps needed to earn their trust and avoid instilling further shame or triggering reactions that are rooted in a trauma history.
A Word About Vocabulary

Currently, we have a problem with the English language in that there is no word that encompasses the topic of severe stress in childhood. The word "trauma" is being used as a shorthand term for far more complex phenomena. The best way to think about the broader concept is that there is a stress continuum, more like the continuum that we understand goes from excellent health to terminal illness, with no absolute points of demarcation and, until death, the possibility of moving back and forth on that continuum. Movement along that continuum is determined by many different factors, such as the state of preexisting health, the age of the person, the nature of the disease process, and a multitude of sociocultural factors.

Similarly, in the last few decades we have learned a great deal about the continuum of stress moving from positive stress to tolerable stress, toxic stress, and traumatic stress. Stress and health interact in complex ways so that, taken together, exposure to stress can be seen as a vast public health problem, particularly when too much stress is experienced in childhood.

Positive stress produces short-lived physiological responses that promote growth and change and are necessary for healthy development. Going to school for the first time, taking tests, performing a new activity, preparing for a big game, applying for college, going off to college—all of these and many other stressors experienced by children and young people can be stressful but are challenges that promote the young person’s abilities to deal with a changing world.

Tolerable stress occurs as the result of a more severe, longer-lasting difficulty, such as the loss of a loved one, a natural disaster, or a frightening injury. The stress is serious enough to activate the body's stress-management system, but if the activation is time-limited and sufficient social support buffers the young person’s central nervous system, the brain and other organs recover without long-term negative effects.

Toxic stress, on the other hand, is associated with prolonged and intense activation of the body’s stress response to such an extent that it can change the very architecture of a young person’s brain with problematic long-term consequences. Many factors determine the ways in which toxic stress affects a developing child—the nature of the stressor, the age of the child, the level of preexisting health and mental health, the family situation, the number and extent of protective factors that exist within the child and the child’s environment. Because human children are dependent on adult care for such an extended period, any experience of disrupted attachment can increase the likelihood that the child will experience toxic stress (Figure 6.1). Toxic stress exposure is being used as a way of

| FIGURE 6.1 |
| EFFECTS OF TOXIC STRESS ON BRAIN DEVELOPMENT IN EARLY CHILDHOOD |

| Impairs connection of brain circuits and in extreme cases, results in smaller brain development. |
| May cause development of low threshold for stress, resulting in overreactivity (chronic hyperarousal). |
| High levels of stress hormones, including cortisol, can suppress body’s immune response. |
| Sustained high levels of cortisol can damage the hippocampus, responsible for learning and memory. Cognitive deficits can continue into adulthood. |
| Verbal abuse from parents and from peers has been shown to interfere with development of gray matter and white matter. |
understanding the profound effects of situations, such as child physical abuse, sexual abuse, neglect, witnessing domestic violence, and being exposed to community violence, particularly when these events are repetitive, even chronic.1,2  

Traumatic stress occurs when a person experiences or witnesses an event that is overwhelming, usually life-threatening, terrifying, or horrifying in the face of helplessness. As with toxic stress exposure, the effects of traumatic stressors will be multi-determined and therefore are highly individual. The young person's preexisting vulnerability, the nature of the stressor, the child's immediate reactions to the event or events, and what happened after the event or events may play a contributing role in determining the complex outcomes that we witness in practice (Figure 6.2). Traumatic events that may be experienced directly by young people include, but are not limited to, violent personal assault (sexual assault, physical attack, robbery, mugging), being kidnapped, being taken hostage, terrorist attacks, torture, incarceration, natural or human-made disasters, severe automobile crashes, or being diagnosed with a life-threatening illness. For children, sexually traumatic events may include developmentally inappropriate sexual experiences regardless of whether there was threatened or actual violence or injury. Witnessed events include, but are not limited to, observing the serious injury or unnatural death of another person due to violent assault, accident, war, or disaster or unexpectedly witnessing a dead body or body parts. Events experienced by others that are learned about include, but are not limited to, violent personal assault, serious accident, or serious injury experienced by a family member or a close friend; learning about the sudden, unexpected death of a family member or a close friend; or learning that an attachment figure has a life-threatening disease.

![FIGURE 6.2]

**COMPLEX OUTCOMES OF TRAUMATIC STRESS**

<table>
<thead>
<tr>
<th>Hyperarousal</th>
<th>Second injury</th>
</tr>
</thead>
<tbody>
<tr>
<td>Memory problems</td>
<td>Loss of social support</td>
</tr>
<tr>
<td>Deficits information processing</td>
<td>Avoidance</td>
</tr>
<tr>
<td>Survivor guilt</td>
<td>Shattered meaning</td>
</tr>
<tr>
<td>Intrusions</td>
<td>Attitude change</td>
</tr>
<tr>
<td>Emotional dysregulation</td>
<td>Reenactment</td>
</tr>
<tr>
<td>Developmental interference</td>
<td>Maladaptive coping</td>
</tr>
</tbody>
</table>

Allostatic load is the term being used to describe the wear-and-tear on the body and brain resulting from forces such as poverty, bigotry, chronic hunger, and lowered socioeconomic status. All can have a profound effect on development and later health outcomes secondary to the constant stress on the child and on his or her caregivers, even in the absence of perceivable traumatic events.4,5  

In families with multiple problems, toxic stress, traumatic stress, and allostatic load may interact in a complex manner, potentially creating a wide range of problems for the young people in the family.
# How Big a Problem Is This?

The magnitude of young people's exposure to overwhelming stress is so great and such a threat to national well-being that the issue must be addressed as a major public health threat.

**Adverse Childhood Experiences: A Public Health Nightmare**

Adversity can be defined as a state, condition, or instance of serious or continued difficulty. It implies that the person who experiences adversity is under conditions of chronic stress, but individuals vary greatly in their response to adversity. Children often experience adverse experiences, sometimes over many years, and this exposure can have very detrimental effects on the body, mind, and spirit. However, the capacity to bounce back from adversity, also known as resilience, often is a response to adverse childhood experiences.

Nonetheless, one sobering illustration of the enormity of the problem posed by exposure to toxic stress comes from the Adverse Childhood Experiences (ACE) Study done by Kaiser Permanente and the Centers for Disease Control and Prevention. The purpose of the study was to examine the impact of exposure to toxic levels of stress across the life span. So far, this is the largest study of its kind to examine the long-term health and social effects of adverse childhood experiences. The researchers asked 18,000 willing participants—all members of the Kaiser HMO in San Diego—if they would take a survey. Most of the participants were white, 50 years of age or older, and well educated, representing a solidly white, middle-class population.

An adversity score or ACE score was calculated by simply adding up the number of categories of exposure to a variety of childhood adversities that the person had experienced before the age of 18. These categories included severe physical or emotional abuse; contact sexual abuse; severe emotional or physical neglect; living as a child with a household member who was mentally ill, imprisoned, or a substance abuser or living with a mother who was being victimized by domestic violence; or parental separation/divorce (Figure 6.3). So, for example, you could interview a young woman and find out that she was sexually abused by an uncle, her mother was hospitalized for depression, and her father drank heavily and used drugs. Her ACE score would be at least 4—score 1 point each for sexual abuse, parental divorce, mental illness in her mother, and substance abuse in her father. Or a young man tells you that his father spent time in prison when he was growing up, his mother was a drug addict and neglected him, and his stepfather beat him. His ACE score would be 5—score 1 point for living with someone as a child who was in prison, another for his mother’s drug addiction, 1 each for emotional and physical neglect, and 1 for physical abuse.

<table>
<thead>
<tr>
<th>ABUSE</th>
<th>HOUSEHOLD</th>
</tr>
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<tbody>
<tr>
<td>• Physical abuse</td>
<td>• Mental illness</td>
</tr>
<tr>
<td>• Sexual abuse</td>
<td>• Substance abuse</td>
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<tr>
<td>• Emotional abuse</td>
<td>• Domestic violence</td>
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<tr>
<td>• Physical neglect</td>
<td>• Parental separation/divorce</td>
</tr>
<tr>
<td>• Emotional neglect</td>
<td>• Incarceration</td>
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</tbody>
</table>

1 POINT/CATEGORY—ADD TO GET TOTAL ACE SCORE
Returning to the original ACE Study of this largely white, middle-class, older population, almost two-thirds had an ACE score of 1 or more, while 1 in 5 was exposed to 3 or more categories of adverse childhood experience. Two-thirds of the women in the study reported at least one childhood experience involving abuse, violence, or family strife. The researchers compared the ACE score to each person's medical, mental health, and social health data and found startling and disturbing associations. The higher the ACE score, the more likely a person was to suffer from one of the following: smoking, chronic obstructive pulmonary disease, hepatitis, heart disease, fractures, diabetes, obesity, alcoholism, intravenous drug use, depression and attempted suicide, teen pregnancy, sexually transmitted infections, poor occupational health, and poor job performance. Worse yet, the higher the ACE score, the more likely people were to have a number of these conditions interacting with each other. In other words, the higher the ACE score, the greater the impact on a person's physical, emotional, and social health.

According to the study findings, if you are a woman and have adverse childhood experiences, your likelihood of being a victim of domestic violence and rape steadily increases as the ACE score rises; if you are a man, your risk of being a domestic violence perpetrator also rises. The study showed that adverse childhood experiences are surprisingly common, although typically concealed and unrecognized, and that adverse childhood experiences still have a profound effect 50 years later, although now transformed from psychosocial experience into organic disease, social malfunction, and mental illness.

**Other Exposure to Violence Among Children**

A replication of the ACE Study—one that would take into account, for example, the other kinds of exposure that inner-city children have, in addition to the existing categories of adversity—is badly needed, but has not yet been attempted. We do know, however, that many children who live in conditions of urban poverty are exposed to dreadful experiences. A 1998 study of 349 low-income black urban children (aged 9–15) revealed that those who witnessed or were victims of violence showed symptoms of post-traumatic stress disorder (PTSD) similar to those of soldiers coming back from war. The Justice Department recently supported the most comprehensive nationwide survey to date of the incidence and prevalence of children's exposure to violence. The findings are extremely disturbing, confirming that most of our society's children are exposed to violence in their daily lives (>60% in the past year). Nearly half of the children and adolescents had been assaulted at least once in the past year. We have not even begun to address the long-term public health effects of this kind of violence exposure, nor have we dealt with the fact that in less than 20 years, the number of children with incarcerated parents has increased by 80%. We have not yet begun to reckon with the fact that, as of 2001, 1 in 6 black males had been incarcerated, and that, if current trends continue, 1 in 3 black males born today can expect to spend time in prison during his lifetime.

**Psychophysiological Pathways to Problems**

Exposure to toxic and traumatic stress often has long-term consequences for young people because of the many ways in which overwhelming stress interferes with healthy function, even while the physiological responses to these very events are intended to promote human survival. We do not have space here to fully explain the nature of the stress response, so we will summarize the key concepts.
Prolonged Dependency and Attachment Needs

Immature human beings are helpless for a longer period of their lives than any other species. This dependency has necessitated an extensive attachment system between adults and offspring that results in devastating deficiencies whenever the young person fails to receive this kind of protection. This reality poses a particular problem for modern family organization simply because in the past there was a much higher caregiver-to-child ratio than exists today. Because of the nature of our society, children have far fewer opportunities to bond with reliable and available adults. This shortcoming becomes a more pervasive problem in adolescence when the desire to separate from primary caregivers is developmentally natural but the only available relational substitutes are peers.

Fight–Flight–Freeze

The basic internal physiological protective mechanism, present in all mammals, is called the fight-flight-freeze response. This is not a planned, deliberately thought out reaction, but a rapid-fire, automatic, total body response. When we perceive that we are in danger, our bodies make a heroic and rapid response. Numerous neurotransmitters and hormones produce massive changes in every organ system. The brain sends instantaneous signals to the adrenal glands to secrete epinephrine or, as it is also called, adrenaline. At the same time, the brain releases a kindred substance, norepinephrine, which affects only the brain itself. Likewise, increased amounts of steroids flood into the bloodstream, as well as opioid substances that are pain relievers.

In the fight or flight part of the response, heart rate, blood pressure, and respiratory rate increase along with alertness and vigilance. Simultaneously a decrease occurs in feeding, reproductive activity, and immune response. This radical adjustment is in the service of survival, preparing us to make an immediate response to the dangerous situation. When this reaction is a response to a real danger, it is time-limited, and it is effective, it is lifesaving and highly adaptive. Problems arise only when this reaction is evoked in the absence of any threat, when the threat is prolonged, or when the organism can do nothing to protect itself from the threat. Then, the chemicals related to this response keep pumping out, negatively affecting our bodies and brains.

If there is no chance for survival if we try to run or fight, we may automatically freeze. The freeze response activates a very different sequence of autonomic nervous system arousal, slowing the heart rate, causing us to fall over and thus preserve blood flow, and even simulate death so that a predator loses interest.

Chronic Hyperarousal

The stress response is lifesaving in a true emergency. But, under conditions of chronic stress, something goes wrong as the body attempts to cope with a chronic overload of physiological responses. The effectiveness of the response diminishes, and the body becomes desensitized to some of the effects of the neurohormones and hypersensitive to others. The entire system can become dysregulated in many different ways. This results in a set of highly dysfunctional and maladaptive brain activities. The person experiences this as a state of chronic hyperarousal. Essentially, the baseline level of arousal for the person has changed and they cannot control their own responses to stimuli.

We all have a “volume control” over our level of arousal. If we are in a lecture hall and hear a noise at the back, we cease paying attention to the speaker and swivel our heads to appraise the source of the noise. Once we are assured that the noise was just a latecomer and that there is nothing to fear, our level of arousal rapidly returns to normal and we are able once again to attend to the lecturer. Our reaction is quite different if we hear a sound, turn our heads, and see a man with a gun heading toward the front of the room. In this
case we become hyperaroused. This is a clear and present danger, and the fight-flight-freeze response is triggered within each of us.

Young people who have been severely or repeatedly traumatized may lose this capacity to modulate their level of arousal. Their reaction to the benign latecomer is quite similar to their reaction to the threatening stranger: They stay hyperaroused and guarded; they are unable to calm themselves down even when they see that there is no danger. They feel embarrassed by their response, while at the same time they are irritable, angry, and frightened for no apparent reason. They are prepared to fight or flee, even though there is no danger. They may also become flooded with memories, images, and sensations that are overwhelming. As a result, they are likely to feel they are “going crazy.”

This reaction can be triggered by almost anything. Once we have experienced a stimulus that evokes fear, we become “fear-conditioned,” a state that is incredibly powerful and difficult for the logical centers of the brain to override. Because of the vast associational network of our brains, we can pair fear with virtually anything. This happens at the time of the frightening event, beyond conscious control, and very quickly. Later the person is usually not consciously aware of the connection between the fear-provoking stimulus, and the fear response has become completely automatic.

Each episode of danger connects to every other episode of danger in our minds, so that the more danger we are exposed to, the more sensitive we become to danger. With each fight-or-flight experience, our mind forms a network of connections that is triggered by every subsequent threatening experience or stimulus. Because we are so intelligent, these connections can be very widely linked to any stimulus that is paired with the dangerous experience.

Alcohol, drugs, sexual activity, violent acting out, risk-taking behavior, eating excessively, inducing vomiting, purposefully hurting the body, exercising, over-involvement in work—all of these behaviors can temporarily produce some relief from this highly unpleasant state of hyperarousal. The problem, of course, is that the relief is only temporary. After withdrawal from alcohol or other drugs, or other behaviors, the agitation rebounds with even greater ferocity. All of these behaviors can become habitual, even addictive, in such a situation. In this way, coping skills that were initially highly adaptive become maladaptive habits (see Chapter 31). Pair chronic hyperarousal with the failure to integrate all information during a traumatic experience and it becomes easy to understand otherwise perplexing symptoms.

# Failure of Integration

The hallmark characteristic of a healthy adult brain is integration of multiple complex functions. It takes at least 22 years for the human brain to achieve the wondrous network of associations that typifies healthy human maturity. Under normal conditions, the brain is constantly integrating the elements of every component of experience—behavior, emotions, sensations, and knowledge. As healthy adults, that integration occurs seamlessly and unnoticeably. In the immature human, the brain is still establishing the neural connections that will ultimately allow that seamless integration. Throughout that long developmental period, the brain is particularly vulnerable to the effects of stress because of the powerful chemical action of the stress hormones, particularly epinephrine, cortisol, and the beta-endorphins.

Under extreme stress, the brain stops properly integrating the components of experience. The psychophysiological mechanism that describes this loss of integration is called dissociation. Dissociation appears to be a central part of many traumatic experiences and is viewed by some as a state—a special type of consciousness that we all have access to under normal and traumatic conditions—and by others as a trait, that is, a characteristic
quality or property of an individual that may be heritable. There is still debate in the field about exactly what dissociation is and how important it is in understanding PTSD. However, like the stress continuum, dissociation falls along a continuum that goes from normal dissociation (as seen in daydreaming) to acute dissociation (commonly referred to as shock) to a wide variety of problematic and more maladaptive forms of pathological dissociation.\(^{15,16}\) As an acutely adaptive state, dissociation prevents a vulnerable and frightened human being from literally dying of fright. But in the longer term, the loss of integration creates significant and complicated problems.

The failure to fully integrate all the aspects of experience at the time of an overwhelming event helps to explain the multiplicity of symptoms that may occur afterward. The failure to integrate one or more sensations that were occurring at the time of the event can result in a wide variety of sensory intrusive experiences known as flashbacks. These commonly are experienced in the form of haunting images, voices, or even hallucinations involving sense of smell. Often missed are the flashbacks that are lodged in the bodily experience of the event or events, commonly known as body memories. Many persistent and repetitive physical symptoms actually represent unintegrated body experiences that occurred during the overwhelming event. Dissociated emotions are very common, resulting in impaired emotional regulation, emotional numbing, and inappropriate emotional responses, particularly when reminded of something traumatic from the past. Dissociated knowledge is evident in the many forms of amnesia that accompany trauma. Dissociated behavioral sequences are recognizable when a trauma survivor compulsively repeats behavioral sequences from the past that lead to traumatic reenactments.

Complicating this further are the cognitive impairments that accompany high levels of arousal, most particularly the “speechless terror” that characterizes moments of exquisite fear. During these times, the brain becomes incapable of properly encoding experience in words, leaving the victim with a void that has been called the “black hole of trauma”\(^{17}\), and thus disabling the person from speaking about, or even thinking about, the worse aspects of an experience.

After a traumatic event, most people experience acute stress, and if they come to medical attention may be diagnosed with acute stress disorder, which by definition must occur within 4 weeks of the traumatic event and be resolved within that 4-week period. Calling this a disorder may be a bit of a stretch, since so many people experience this after an overwhelming event.

According to the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5), published by the American Psychiatric Association (APA) and regarded as the standard for diagnoses, if acute stress-related symptoms persist for longer than a month, then a person is suffering from PTSD. If so, the person has experienced or witnessed a traumatic event; is suffering from intrusive re-experiences, such as nightmares and flashbacks; actively avoids encountering reminders of the traumatic event; and experiences symptoms of increased physiological arousal.\(^{18}\)

Complex PTSD or developmental trauma disorder as of this writing are not yet officially considered diagnoses as defined by the APA. Nonetheless, people working in this field believe it is necessary to understand the very complex changes in a person's body, mind, identity, personality, relationships with others, ability to differentiate right from wrong, and meaning-making that may be the result of exposure to toxic stress and disrupted attachment beginning in childhood, or to chronic, severe interpersonal violence that occurs at any age.\(^{19}\)
The Good News: Parents and Other Adults Can Be Protective

We may not be able to prevent every bad occurrence that happens to young people, but the good news is that a relationship with one adult in a child’s life may make all the difference in whether or not he or she ends up following a positive life trajectory. The basis of this may turn out to be related to yet another biological adaptation recognized in primates and humans, particularly among females, called “tend and befriend” and sometimes called “appeasement.” This happens when someone addresses a threat from another person by offering them something they might want or that would therefore change the emotional dynamic away from immediate danger, while allowing the threatening other to remain in control of the situation.

Research suggests that, by virtue of differential parental investment, female stress responses have selectively evolved to maximize the survival of self and offspring. As a result, females are more likely to respond to stress by nurturing offspring, exhibiting behaviors that protect them from harm and reducing neuroendocrine responses that may compromise the health of their offspring (the tending pattern), and by befriending (affiliating) with social groups to reduce risk. Researchers of social animals and humans hypothesize that females create, maintain, and use social groups, especially relations with other females, to manage stressful conditions and that these attachment processes chemically counteract the negative impact of the stress hormones.

The well-being of our children depends on many more adults—inside and outside of the family—adopting the strategy of “tend and befriend,” especially with young people facing the most adversity. Any of us can make a difference in a young person’s life. Central to the notion of positive stress is the availability of a caring and responsive adult who helps the child cope with the stressor, thereby providing a protective effect that facilitates the return of the stress response systems back to baseline status. When buffered by an environment of stable and supportive relationships, positive stress responses are a growth-promoting element of normal development.

Thus the essential characteristic that makes this form of stress response tolerable is the extent to which protective adult relationships facilitate the child’s adaptive coping and a sense of control, thereby reducing the physiological stress response and promoting a return to baseline status.

Pulling It Together: What Might Trauma Look Like in Our Young Patients or Clients?

The presentation of trauma and our response as caring adults who serve youth will be covered more thoroughly in Chapter 22 on trauma-informed practice. Here we wish to briefly establish how a state of hypervigilance or dissociation needed for survival might look in a teen we serve.

- It may be harder to forge a trusting relationship, because the young person has not experienced adults as consistently safe.
- Parents and teachers may describe the youth as easily upset, easily provoked, or highly reactive.
- The youth may display what others consider to be inappropriate emotions and behavior.
- The young person may be triggered by traumatic reminders in the environment, and the emotional responses may be occurring during an altered state during which the youth experiences flashbacks.
- The youth may be diagnosed as hyperactive or oppositional defiant.
- The teen may appear inattentive as he is focused on internal stimuli or hyperattentive to “danger signals” of which adults are not aware.
• A common post-traumatic presentation is dissociation. This may be reported as “lying,” which represents a confabulated reality produced to replace actual events that are too difficult to recall, or “zoning out,” which represents a behavior that has proven to be adaptive during unimaginable moments.

Recognizing these presentations allows us to better serve without judgment and to approach youth with the mindset of “what happened to you?” rather than “what is wrong with you?” It allows us to see resilience where others may view ineptitude, an oppositional personality, or brokenness.

**Group Learning and Discussion**

This chapter provides the basis of understanding on how stress affects physiology and behavior. Chapter 22 on trauma-informed practice offers strategies to better assess and serve traumatized youth. Consider reading these chapters together and having your group participate in the group learning and discussion exercises suggested in Chapter 22.

[Continuing Education]

If you are applying for continuing education credits, a test is available online. For more details, visit www.aap.org/reachingteens.

**References**


**Related Video Content**

See Chapter 22.
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