Autism and Trauma: Calming Anxious Brains

By Lara Palay, Senior Fellow posted October 5, 2012

Hannah[1] is 6 years old. She likes numbers and enjoys music. She has started piano lessons and shows an unusual tolerance for the repetition of scales, sometimes sitting at the piano for hours. After her sixth birthday, her attraction to counting and repeating songs has become more marked, and at the same time she has grown more socially withdrawn. Always a shy and soft-spoken child, as Hannah entered first grade she did not make friends, and usually sits by herself during recess, playing counting games and humming songs she plays at home on her CD player as soon as she returns from school. The more Hannah engages in these socially isolating and repetitive behaviors, the more she gets absorbed and withdraws from others. Hannah knew her numbers well at the beginning of the school year and learned computations before any of the other children in the classroom. She gets praise for this from her teachers, but it further isolates her socially. When asked why she likes numbers and counting so much, she says, "Numbers have no feelings".

At home, Hannah prefers to know ahead of time what is happening in the family schedule and becomes anxious if the routine is disrupted. Recently Hannah's parents decided at the last minute to stay overnight at a hotel after a late dinner with college friends while Hannah stayed with her grandmother for the evening. Upon hearing of this change of plans, Hannah became so distressed that she threw up, and eventually Grandmother became so concerned that she called the parents and asked that they return home that night.

Hannah has always been a picky eater, and her reluctance to eat has grown more severe. She now refuses to eat most foods except for apple slices and chicken nuggets.

Hannah has difficulty articulating her feelings, and will retreat to her room to draw "number pictures" and listen to music when upset. If pressed, Hannah will shut down and be unresponsive; if pushed further she becomes extremely agitated. She has bitten her own arms almost to the point of breaking the skin when in this state of distress. Only being allowed to return to her room and count and listen to music calms her.

Easy to diagnose, right?

Hannah easily fits a cursory profile of many autism spectrum characteristics. She shows advanced ability in linear thinking and math, but her social skills are lacking. When upset she displays stereotyped motions and behaviors such as rocking, humming, and self-injurious behavior. She self-soothes with socially isolating activities such as counting and practicing scales. She shows marked sensitivity to food texture, is rigid in her eating demands, and handles spontaneity poorly. When overwhelmed, Hannah

either shuts down or becomes hysterically agitated.

Here's the rest of the story. Tyler is Hannah's 14-year-old neighbor. He began babysitting Hannah two years ago. Tyler began showing her pornographic videos, calling them "grown-up movies". He gave her treats and made her promise not to tell about "letting her act like a big kid" when he visited, so that he would still get to babysit. At first Hannah enjoyed the extra attention from an older child, and was thrilled to be treated as "more grown-up". She also responded enthusiastically to "keeping a big-kid secret". Eventually Tyler persuaded Hannah to perform fellatio on him in front of some other neighborhood children, as the "games" advanced. This occurred a number of times until Tyler's family moved away and he no longer babysat for the family. Hannah never disclosed what was happening while the abuse was occurring, though she became less excited and eventually extremely reluctant when Tyler came to babysit, an event that used to be greeted with enthusiasm.

Hannah, always somewhat shy, became even more isolated and withdrawn soon after the abuse began. She became increasingly anxious and dependent on routine, becoming overwhelmed with anxiety and fear if routine was disrupted, especially if her parents were absent. Social interaction grew more difficult to manage, and she grew to rely more and more on soothing, repetitive activities such as counting, music and rocking. The more they calmed her, the less she explored other skills such as interacting with others. Expressing her feelings became increasingly difficult, as she felt she could not reveal the most important part of her story-the abuse. Over time it became easier for Hannah to not express any internal thoughts or feelings at all. The less skill she developed, the more anxiety-provoking social interactions and self- expression became, worsening the cycle of isolation and withdrawal.

For Hannah, food and eating was quickly associated with the sexual abuse. Eventually almost all foods became triggering for Hannah. When asked to eat some mashed potatoes as part of subsequent trauma treatment, and to describe how she feels when eating it, Hannah said "I don't want it in my mouth, please don't make me swallow it".

In Hannah's case, she initially felt comfortable and "special" with Tyler, but these feelings were quickly replaced with fear. As the "games" with Tyler progressed he moved out of a grooming phase, which focuses on befriending the child and gaining trust, and into a more coercive phase, using intimidation and threats to ensure Hannah and the neighbor children's compliance and maintain secrecy.

Here's what happens in the brain during trauma

To understand some of what has happened in Hannah's brain during these episodes, we need to understand how the brain works, and we will start with the limbic system. The limbic system, which is made up of two structures, the hippocampus and the amygdala, has to do with emotion, memory and other things we will explore in more depth later. For the moment, we are concerned with one of its functions-

responding to danger. The limbic system receives a stimulus; for example, a loud noise. It then has to answer the question, 'Is this safe?' The limbic system routes the response process in one of two directions: if safe (the noise is a fire drill) it is going to the cortex to work it out (remember to leave the building through the fire exit, but there's no need to be afraid, everything is ok). If not (smoke is pouring under the door), the brainstem will react to it by changing the breathing and heart rate and other basic-function systems to prepare for the threat. This also depends on individual perception; someone who has been injured in a fire may still find his or her autonomic systems responding to "danger" , even during a drill. This, in fact, is one way to characterize Post-Traumatic Stress Disorder: responses that are out of proportion or inappropriate to the situation.

When we feel threatened, the amygdala signals the brain that we are in danger, and floods the brain with adrenaline, norepinephrine and cortisol. These chemicals prepare us to survive the danger by giving us the energy and focus to fight, flee or freeze. Our cortex, which does our abstract thinking and complex decision-making, is slower to respond when the amygdala is activated. Once we have escaped the threat or realized we are not really in danger, the amygdala calms down, the stress chemicals in our brains subside and the cortex becomes active again, allowing us to think more clearly. If this happens only occasionally, the cortex is "off-line" only until the danger is over, and recovers quickly and fully after a few seconds. With occasional repetitions of this circuit, there is little or no change in the brain. If, however, the fear is very intense and happens over and over again, the brain starts to adjust, actually "rewiring" itself and devoting more space to the structures that are used the most. The amygdala and brainstem can become enlarged, and the cortex can compress or shrink. The fear cycle gets faster and stronger, and this makes the fear even easier to trigger and the cortex slower to reactivate. (DeBellis, 2001; Schore, 2003)

If the cycle becomes strong enough, just thinking about the events causes the cycle to start, and over time the cycle can "start itself". It becomes a vicious circle, as the brain becomes more and more primed to be set off by very little or seemingly nothing to launch the sequence. It's like an electronic alarm system that is a little over-sensitive and goes off too easily, and soon stays on almost all the time, or in other instances becomes damaged and fails to go off when it should.

Associations with that fear can become more and more generalized, as in the case of "Albert". In a classic set of experiments, a little boy (given the pseudonym Albert) was conditioned to fear white rats, though he had never displayed fear of them previously. The first time he was presented with various animals, nothing happened. Then experimenters Watson and Rayner paired the appearance of a white rat with a loud noise, startling Albert. Eventually, Albert would flinch and exhibit fear when shown the white rat, even without the noise. Over time, the experimenters noticed that Hans exhibited the same phobic behaviors with stimuli that were increasingly unrelated to the original object. Anything white and furry, like a white rabbit, and then anything white *or* furry (animals, cotton) caused the fearful response. In other words, over

time Albert's brain expanded the list of objects that caused him to react, or as we will see, the "map" in his brain expanded to include wider territory, including more general objects that now caused fear where none existed previously (Watson and Rayner, 1920).

Even when she is not around Tyler, Hannah's brain can be easily reminded of the trauma. For Hannah, food is closely linked to the experience of the oral sexual abuse. At first, only foods that strongly evoke the experience trigger the brain response. As her brain gets more efficient with each trigger, "learning" the fear response, more and more neural space is given to the response. Less space is given to associations with food that are neutral or pleasant. Over time, the response generalizes, until almost all food sets off the fear response.

Autism or trauma?

Autism is a pervasive developmental disability that affects communication, social intelligence and processing. Effects range from mild to devastating. Causes are unknown; heredity and environmental factors seem to be the primary elements under study. Is autism a single disorder, or a symptom cluster with many roads? No one knows. In yet another parallel with trauma, autism may also have, as DeBellis, below puts it, infinite causes (or in this case subtly varied combinations of vulnerabilities and stressors) with limited neurological results. Eventually, as science understands more about what is happening in the brain of a person with autism, we will be closer to knowing the answer.

As Hannah becomes increasingly absorbed in the behaviors that calm her brain, she is more socially isolated and teased by her peers. If word is out about her situation, she might even be ostracized or stigmatized about the acts committed against her. The Social Pain Overlap theory postulates that Hannah would experience that social pain on the same neural pathways as physical pain (Eisenberger and Lieberman, 2003, Riva et al, 2011). Essentially, her body would not distinguish between being physically hurt and emotionally or socially hurt. This pain might drive her further into her dissociative, self-soothing behavior, reinforcing the neurological pathways that reward those activities with serotonin, a chemical that produces feelings of calm and safety. This stress-reward pattern can then make her "odd " behavior more habitual or even compulsive. This behavior in turn increases her isolation, causing social pain, strengthening her urge to self-soothe, and so on and on. A perfect vicious circle develops.

If Hannah does indeed have a developmental disability like autism, research suggests that the accumulated stressors produce the same neurological effects over time as the devastating effects of a trauma such as sexual abuse. In other words, the daily stress of feeling overwhelmed, unable to do what other people can do, "different" or lacking the control over daily choices (where to live, what work to do, what staff and roommates one has, etc.) can create ongoing "small" stressors that, over time, produce effects in the brain (specifically anxiety responses) that look very similar to trauma and in fact may be neurologically identical. In the absence of trauma, these effects can be called "daily anxiety producing life experiences" (Sobsey, 1994). Sensory defensiveness,

common in children on the autism spectrum, may increase this level of daily stress and even be exacerbated by trauma (Heller, 2002)

In terms of potential changes in the brain after stress, Hannah's age matters. We know that the younger the brain, the more devastating the effects of repeated stress (De Bellis, 2001). The extent of the effects of trauma is a complex interaction of genes, psychosocial environment, critical periods vulnerability and resilience.

Michael DeBellis describes three key assumptions about trauma:

- there are infinite causes of trauma, but finite responses
- trauma is worse for kids than adults, neurologically
- interpersonal stressors like abuse are worse than non-interpersonal ones (community violence, natural disaster, e.g.), as they are more likely to be ongoing, and include loss of trust as well as actual traumatic event.

In Hannah's case, what came first: autism spectrum traits inherently vulnerable to, and made worse by, trauma, or trauma-created, spectrum-like traits? This is hard to say. While more research is needed, many of the interventions address the "finite results". We don't need to answer the question of ultimate cause to take action. For Hannah and children like her with suspected trauma, therapists and treatment providers need to put aside attribution for the moment, target reducing anxiety and fear. Then they can work through the "spectrum" barriers to communication, gain trust, and work through the trauma. Only then we accurately assess ongoing needs that may be autism spectrum-related.

Neuroplasticity: Our changing brains

To fully understand the impact of trauma on a growing brain, we first have to understand how our brains develop. Our brains have periods of growth and retreat, just like other systems; trees produce leaves and shoots, then let leaves fall, and then grow them again. There are comparable periods of growth and pruning in the human brain. At birth there are 50 trillion connections between neurons (synapses) in the brain. By ages 3-10 that has grown to 1000 trillion connections. By age 20 there are only 500 trillion connections left (Rintoul, 2005). This period of pruning is an important part of brain functioning; repeated activities are strengthened by multiplying neural connections, literally taking up more space in the brain. The ones that do not get used as much (for example, neurons that respond to speech sounds that do not commonly occur in one's native language) eventually are pruned away. Literally, if we do not use it, we lose it, as our brain efficiently decides what to keep and what is no longer needed, so that it can use the space most effectively.

We are born with innate receptivity for love and connection. Our brains grow the capacity to understand the emotions of others and to experience pleasure in interacting with others 3 months before we are born (Schupp, 2004). The ability to trust, and the brain chemistry connected with it, begins at one month of age in the amygdala section of the limbic system. The

amygdala completes its development at 18 months, just about when we are mobile enough to start venturing away from our parents, secure in our emotional connection to them.

What does trauma do to the brain?

Severe or repeated trauma can re-route emergency systems that are meant to be used only occasionally, and leaves them active, like a switch stuck in the "on" position. This can shrink or damage the part of the brain that thinks and plans, and potentially damages the brain's ability to feel love and safety in the presence of others.

To deal with this pain and stress, the individual may become more rigid and inflexible in his or her thinking and develop tunnel vision and selective listening. Over time to compensate for the damage done to the short term memory and ability to sequence by continued exposure to our fight or flight response, or allostasis, the individual may develop rituals, become rigid and controlling or "oppositional", shut down, withdraw, rage, retreat into a special place, or become over-involved in things that help the individual to escape. In Hannah's case as we have seen, this escape may come in the form of her obsessive counting and, when severely agitated, skin-biting.

As Eliana Gil, an expert in childhood trauma puts it, "Everything an abused child does after the abuse is designed to give them a sense of safety." We know that much of what a child with autism does is designed to relieve anxiety i.e., feel safe. Behaviors that look bizarre, inappropriate or combative are most likely responses to triggered anxiety, or efforts to make sure the anxiety isn't triggered in the first place. For some children, we can assume that they rock because they need to block out stimulation and send calming chemicals through the brain-not because they want to look weird or annoy adults or because they "just do that".

Psychopathology and trauma

Trauma can be a predisposing factor for many forms of psychopathology. Table 1 below contains a few of these pathological experiences. This also illustrates the overlap (and at times mistaken attribution of) of trauma-related psychopathology (Rossman et al, 2000). The right column lists some symptoms associated with autism spectrum disorders.

Adults and children who have experienced interpersonal violence may have lower social competence, less empathy for others, difficulty in recognizing others' emotions, less ability to recognize their own emotional states, are more likely to develop insecure or disorganized attachments. Many of these traits are also shared with autism.

As noted above, autism either causes or co-occurs with many of the behaviors or pathologies listed above, i.e. self-injurious behavior. And as we shall see, in the case of fearful, rigid, overwhelmed children, it may be more important to target the brain system that needs calming than delaying treatment to explicitly identify the cause.

Treatment for Hannah

Therapists working with Hannah first had to patiently learn her "autistic" symptoms; to be

with her calmly to establish a sense of trust without entering into power struggles by requiring her to stop her self-soothing behaviors. They began this process by treating her in a day program with a peaceful, calming environment, with a manner that was warm without being intrusive, and above all, consistent. For Hannah, it took about six months to trust the staff enough to begin real trauma work. Clinicians report that this is a typical time frame for children with trauma, and the period may be related to brain change, i.e. the time to build trust is actually time needed for neural re-mapping, i.e. learning to trust (Mary Vicario, LPCC-S, personal communication, 2012).

After they worked on trust and relaxation, clinicians introduced the issue of food, and asked the question about how she felt when eating. This revealed a lot about her traumatic experiences, but more importantly it gave them an idea of what she would need to re-learn; i.e., positive associations with food. While not being overly reliant on "factual" information (this was not a legal inquiry or deposition) they slowly gained access to Hannah's reconstructed emotional story, the "implicit memory" of the abuse, coded into her right cortex. At this point, having worked past some of the isolating, autistic-looking behaviors that had rebuffed others, the therapists were able to begin the trauma recovery work.

The first of three elements of trauma recovery can be described as re-experiencing the trauma. When this occurs, Hannah is able to process the trauma in a realistic way, experiencing whatever levels of pain, anger, loss, or other emotions are elicited by a detailed memory of the event. With guidance, she can learn not feel irrationally responsible for having caused the event.

The second element is releasing the trauma. At this stage Hannah understands that the experience occurred in the past and does not see or react to the experience as a clear and recurring danger in the present. This is the cognitive part of Hannah's emerging ability to self-regulate her behavior without acting out.

Hannah no longer feels devastated by the memory of the event. This is the element of Hannah's emerging emotional self-regulation; she becomes less dependent on compulsive ruminating on numbers or other isolative techniques to manage frightening or painful feelings.

The third element is reorganizing one's life. Hannah now begins to live her life without feeling compelled to relive or repeat the traumatic event either consciously or unconsciously. She can also define her life without the trauma being the central organizing piece of who she is, and how she lives her life; consciously, unconsciously, and chemically.

Hannah's implicit memory is of critical importance here. Implicit memory includes sensory (visceral or body), emotional and procedural (picture) memory. The majority of our memory is implicit. This is often called "early memory". The most important social and emotional lessons occur during our earliest years, so we have little or no explicit (picture) memory of these events, because our hippocampus is not yet mature.

Implicit memory has more input from the amygdala, which enhances memory storage by stimulating the release of and glucocorticoids in negative emotional situations. (Quirke et al 2003, Pare et al 2004). "Implicit memory processes are faster, automatic and guide explicit memory and conscious experience. By the time we are consciously aware of someone our experience has been shaped by past experience." (Cozolino, 2006). It takes our brain 400-500 millionths of a second to bring sensations into conscious awareness, but it takes only 14 millionths of a second to implicitly react to and categorize visual information.

Explicit memory is language-based. As a child matures, explicit memory starts and is woven together with implicit memory. Our implicit "early lessons" when woven into explicit memory become "facts of life" belief systems that we seldom think to question. It is these implicit memories that often must be addressed in trauma therapy.

Why work from the inside out?

When working with behavior, we often assume it's important to shape the behavior rather than address internal forces, which may be hard to imagine or predict. However, a purely behavioral approach in these cases is misguided and ineffective. Redirecting or controlling behavior without addressing the feelings or thoughts that cause it is a temporary solution at best; when the feelings and thoughts recur, so will the behavior, or it may be replaced with a worse one (Harvey, 2012).

Particularly in the case of people who have been traumatized, it's imperative to avoid aversive interventions. While they can be effective for a short time from a behavioral standpoint, there are significant problems with them from others. Leaving aside the ethical considerations, aversive interventions, even mild ones, can release corticosteroids that shut down dopamine. When dopamine is depleted, the brain may respond with a dopamine craving which may be met through bad behavior, which is often a source of excitement or attention for the individuals we work with (Schore, 3003).

This does not mean that modalities that use aversive interventions should be abandoned, but merely that they should be expanded to take into account the neurological basis of learning and rewards, perhaps exchanging the aversive intervention for a different strategy. This is true for Hannah, whose brain has been altered by trauma, but it is true for everyone else too. Humans learn better, in a state of focused attention, when learning is associated with positive emotion (Rintoul, 2005).

Many teaching methods use a repetition-and-reward pattern that exploits the brain's natural tendency towards change though positive association. A good example is Sesame Street. When introducing a new letter, they repeat it several times, then do something to make their young viewers laugh: a Muppet appears, or someone throws a pie. The rush of dopamine accompanying the laugh may prime the brain to retain the information better than simple repetition on its' own. Some psychotherapeutic models such as the Teaching-Family Model use a similar ratio of positive interactions to corrections to teach (Wolf et al, 1976). It's

important to remember that "learning" does not mean merely new factual information, like a new number or letter. It also means new coping strategies and, in a broader sense new responses to stimuli. The brain learns better when it is not hijacked by the amygdala, and retains new information better when it is bathed with dopamine and other neurochemicals associated with connection. The better the sense of connection, the better the learning. The better the learning, the more connected one feels-each loop of input strengthens and deepens the other). Experiences that strengthen connection are:

- frequent, regular and predictable
- occur in the context of a safe, warm, supportive relationship
- are associated with positive emotions (fun, humor, excitement, comfort)
- involve several senses
- are responsive to an individual's needs, interests or initiative (Rintoul, 2005).

If people learn better with these associations, and aversive interventions can actually increase negative behaviors in attempts to replace dopamine, then it is nothing less than common sense to reframe some behavioral approaches. For children with developmental or other disabilities, occupational therapy has an arsenal of techniques that sooth the limbic system, including light and deep pressure, joint compression, large-muscle movement and rhythmic movement. These interventions, by calming the amygdala and creating feelings of comfort and safety facilitate connection, which enhances learning and neural re-mapping.

The opposite of traumatic damage is resilience. Studies of resilience factors in children have identified 5 major components to resilience in the face of chronic or overwhelming stress such as Hannah experiences. These factors are:

- Autonomy (what I have control over, and how I make things happen)
- Self-Esteem
    - sense of self: likes and dislikes, values, qualities
    - sense of self-worth: when you feel loved and valued
    - sense of self-efficacy: how do I affect change?
- External support Systems (can be people, a pet, a fantasy)
- Affiliation (connection to and identification with a cohesive supportive group: church, volunteering, scouts)
- Positive experiences with people outside a stressful environment, especially people in authority

To better understand what helps with preventing or mitigating the effects of traumatic stress, it helps to look at the emerging understanding of recovery from trauma, or "Post-Traumatic Growth". Post-Traumatic Growth suggests that trauma survivors, rather than merely healing from the injuries, can actually integrate the experiences in a transformative way that changes them for the better; they may experience greater feelings of resilience, self-confidence, self-awareness and a wider range of coping skills than they might have without the obstacle of trauma to overcome. This is not to say that trauma is good; merely that even after trauma, good things are possible.

Using approaches that emphasize creating positive experiences and building trust may be an effective way to systematically introduce growth-conducive goals into existing supports for children with autism. Authors Jones and McCaughey suggest that such methods (in their example, Gentle Teaching) can be integrated into Applied Behavioral Analysis (Jones, McCaughey, 1992).

What about drugs? The issue of psychotropic medication for children is fraught; the maxim that "What fires together, wires together", suggests that mood and anxiety disorders should be treated aggressively to prevent adverse mapping for depression and anxiety. On the other hand, over-medication of children is a concern in all areas of pediatric psychiatry. With trauma, one particular form of medication must be examined closely and warily. Children may be at risk for being given antipsychotics, especially if their behavior is disruptive and bizarre. Some brain researchers speculate that When children with traumatized brains are given stimulants, their brain may be kept in a dissociative state, never allowing the system to recalibrate itself, causing more lasting damage (Vicario, personal communication, 2012). To prevent the effects of trauma or chronic high levels of stress, we must first reduce the stress. To do this, we must first understand two important things. First, many things cause "toxic" levels of stress, especially for neurologically fragile children. Don't assume that because a child hasn't (to anyone's knowledge) been physically or sexually abused, trauma is not a factor. Learn to think in terms of frequent, "little t" traumas or stress-causing conditions that accumulate. Second, when protecting children from danger, look in the right places. Children are far more likely to be abused by someone they know than by the archetypal "stranger in a van". Child abusers very often are known to the child and are charged with some level of oversight or responsibility for him or her (Oesterreich and Shirer, 1998; Delaplane and Delaplane).

While data are inconclusive, researchers suggest that having a disability may make a child more vulnerable to abuse (Howlin and Clements, 1995; Ammerman, Van Hasselt and Hersen, 1988). This may be due to limited mobility, limited ability to speak and report, less likelihood of being believed, greater social gullibility, and greater reliance on a greater number of people, many of whom may change jobs frequently and not have thorough background checks. Finally there is the looming issue of bullying. Remember, if the social pain overlap theory holds true, then the body registers social pain on the same neural pathways as physical pain, then daily emotional bullying has the same neurological effect as daily beatings.

What does research need to do next?

The theory of neuroplasticity and "regionalization" of the brain is ushering in a new era of neuroscience. Psychiatry is becoming ever more biologically based. There is no need to state in this article the need to continue this work, or the imperative to apply science to clinical interventions: with children who have been traumatized, with children on the autism spectrum, and of course with children who are both. One thing to consider, however heretical it

may sound, is how hamstrung policy funding can be by insisting on "evidence-based" practices when funding projects and services. Evidence-based does not necessarily mean most effective; sometimes the practices and approaches with the most studies behind them are the ones most easily quantified and "countable"; this may be one factor in the overwhelming preponderance of behavioral approaches in disability services in the U.S. If we had relied only on "evidence-based", fully documented and perfectly known practices, antibiotics would never have been developed.

This is not to suggest that we should abandon efforts to establish which approaches work and which ones don't. It just means that we should widen our scope to include reasonable trials of promising approaches (the science makes sense that it would work), consensus-based (clinicians are experiencing success using it) as well as evidence-based, evaluate often, consider taking elements of mixed results to strengthen the whole, and see what emerges.

There are other problems in terms of integrating a neuroscientific, trauma-based orientation to autism services. I do not propose to address the controversy around ABA and other models; I believe that there are many paths to the same destination. Rather, as noted above, it makes sense to consider existing approaches in light of neuroscience and trauma studies, and to find ways with which to enrich them, as we noted above when we suggested adding neuroplastic techniques and amygdala-calming strategies to an ABA approach, for example.

Conclusion

Some children with autism also have "Big T" trauma. Some traumatized children look autistic, but aren't. Autism can be stressful and traumatic in itself. Not all autistic symptoms represent Big T trauma. Not all traumatic symptoms will mimic autism spectrum. However, we know there is overlap in how they appear, because they are related to the same systems in the brain. We know that interventions that calm a traumatized brain will calm (or at least will not harm) an autistic brain. We know that some individuals, whether by virtue of their autism disorder or not, will actually experience abuse and other traumatic events. Finally, we know that having an autism spectrum or other developmental disability creates everyday stresses and anxiety that can cause the same cumulative effects.

For all these reasons, we need to assume that every child on the spectrum carries some load of toxic stress. We should make trauma-informed interventions a universal precaution. In healthcare settings, universal precautions translate to simple steps: treat everyone as if he or she has a communicable disease. Wear gloves, clean bodily fluids with bleach and so on. If the patient is sick, these precautions keep others safe, and if he or she isn't sick, these measures won't hurt them or interfere with other treatment. Trauma-informed care should be used the same way. Treat every child as if toxic stress is a potential factor, and that feeling safe and in control are of paramount importance. For children overloaded with stress, this will be critical; a child who does not have significant levels of stress will still respond well and not be harmed in any way.

Finally, we should offer children with suspected

significant trauma treatment that takes into account the autism symptoms that may be idiosyncratic or off-putting in typical treatment settings, and work through the autism symptoms to address the trauma.

Is Hannah on the autism spectrum, or were her symptoms and odd behavior caused solely by the trauma of the sexual abuse? When treatment began that question was impossible to answer, and as we have seen, was not really the point at the time. Helping Hannah learn to calm herself more appropriately, to express distressing memories and to repair a sense of safety and trust were the priorities. As her trauma symptoms subside, she may still have symptoms severe and persistent enough to qualify her for a diagnosis of an autism spectrum disorder. Or, she may have some residual traits and behavioral habits reminiscent of autism, but they may be so mild that she does not meet the criteria for a full-blown disorder. Finally, she may no longer "look autistic" at all. Clinicians who work with children who have been diagnosed with autism spectrum disorders and traumatic stress have seen all three scenarios at different times (Vicario, personal communication, 2012).

These distinctions about cause and effect will be important for Hannah and her parents as they meet ongoing challenges and plan for her future. They should matter much less to the professionals we treat children like Hannah. What it all comes down to is this: Calm the brain. Use interventions that stimulate connection and associate limits with safety and comfort. The more positive associations, the larger the neural map allowing for those associations to take hold. The more negative interactions, the more efficiently the brain will set off the 'alarm system' and the agitation/acting out/shutting down sequence. On this level, it almost doesn't matter why the brain is over-reactive. Trauma or autism; triggering, toxic stress or sensory overload: an anxious brain needs to be calmed, to feel safe and in control. When the brain is calmer and stress responses are manageable, other diagnoses will emerge, if they are present, and can be addressed accordingly. If a diagnosis has already been made and treatment has begun, these approaches can be woven into existing treatment. Science cannot yet tell us if the brains of autistic children are more, less or equally plastic as the brains of non-autistic children. In the absence of evidence suggesting otherwise, we should proceed as if they are equally so, with neuroplastic interventions at the forefront. We don't have to delay to start tapping into the potential of the brain to redirect its energy from anxiety to growth. Hannah and children like her, whose developing brains experience chronic, damaging stress, can't afford to wait.

Notes

1This case example is a composite and does not refer to any actual individuals living or dead. For this composite, as well as help with source material, the author gratefully acknowledges the assistance and expertise of Mary Vicario, LPCC-S.

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