The Body Remembers

Volume 2

Revolutionizing Trauma Treatment

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CHAPTER TWO

Precision ANS Regulation

What to Look For

Everything in physiology follows the rule
that too much can be as bad as too little.
—Robert M. Sapolsky

Three or so decades ago, one of my clients, Greta, after much preparation, was ready, we agreed, to process memories of a very traumatic childhood incident. This was the first time she had wanted to talk about it and I was interested. Too interested. We both became so engrossed in her account that it was only when she was finished that either of us realized something had gone terribly wrong. Rather than feeling better from the telling, she was extremely anxious and so stiff she could barely move. During the next week she was plagued with panic attacks and called me multiple times for support and stabilization. For her, what should have been an exciting progression in her therapy backfired into regression.

In another situation, a new client, Hans, easily answered all of the usual intake and assessment questions and told me he was "fine." Nonetheless, when he left my office he became very confused and lost his way several times on his familiar route home. He was so distressed that he canceled the next appointment we had scheduled and never returned.

Could I have prevented these therapeutic disasters? I believe so. In those days I was brand new to traumatic stress studies and had not yet been exposed to theory or tools that would have helped me to monitor autonomic nervous system (ANS) arousal. I wish that I had that knowledge then. Likely, I would have noticed as Greta's facial expression gradually lost its animation, her respiration quickened,

and her skin tone slowly blanched. Those observations would have led me to slowing down or stopping her narrative, *putting on the brakes*, to reduce arousal and stabilize before she went on. It might even have meant pacing her memory processing in a different way, taking it slower and in smaller pieces. Likewise, with the necessary information and greater understanding, I might have seen that Hans was *not* "fine," that his pupils were dilating. I could have inquired about the temperature of his hands and feet, and I may have noticed as his posture became more collapsed.

Nevertheless, I did learn from those costly mistakes and, as a result, became interested in knowing more about identifying the effects of ANS arousal. My observational skills gradually improved—for example, for a long time I just could not see changes in skin tone, but did eventually with persistence. And I learned, as well as created, interventions for *putting on the brakes*. Consequently, the therapy I provided became safer and more digestible for my clients and, as a side effect, my own professional balance benefited from self-observation as well.

Such experiences piqued my interest in passing on what I learned about making trauma treatment safer through observation and modulation of the ANS. Therefore, the purpose of this chapter is to review and then update and integrate current understanding and observation of the ANS. In particular, I aim to give trauma therapists a new and improved tool that they can use to gauge and monitor their clients'—*and their own*—level of autonomic arousal at any given moment in time. By doing so, therapists will always be in the position to know whether their clients are able to safely manage what is happening and if they are able to integrate what is being worked on in therapy. Likewise, the therapist will also know if she herself is able to think clearly despite the level of stress in herself and her client. To this end, I want to expand your knowledge of *what to look for* and what to do about what you see and hear from the client, as well as what you sense in your own body. There is a full-color insert following page 38 that contains one table and one chart that will be fully explained within this chapter. I hope they will contribute to the understanding of ANS arousal states so that clients can be better monitored, evaluated, and regulated.

You may want to take your time with this chapter. Many of my colleagues read earlier versions of it, helping me to better explain the concepts and make it more accessible without diluting it. Nonetheless, it is dense. Do not be concerned if you need to read it more than once to grasp the particulars.

At least where the treatment of trauma is concerned, there needs to be a great

deal of precision in the therapy, perhaps even more than with other types of counseling and mental health issues as in the examples, above, of what can go wrong. You have probably already encountered the volatility of trauma treatment. Clients can easily get triggered, come unglued, and flip into flashback and other types of dysregulated states. That is because traumatized individuals are prone to extreme disruptions of their nervous systems which can sometimes lead to unpredictable emotional and somatic responses. ANS arousal levels can suddenly skyrocket or plummet, causing enormous discomfort, threatening emotional stability, and risking retraumatization. On the emotional side these responses may include anxiety, panic, dissociative episodes, confusion, and flashbacks. Examples of bodily disruptions can consist of extremely high or low heart rate or blood pressure, palpitations, hyperventilation, fainting, and the like. Over the last few decades, multiple methods for helping individuals recover from traumatic incidents have been developed. Though they emerged from divergent disciplines, these methods all have at least two things in common: structure and precision. To heal trauma, many in the field of traumatic stress have independently discovered that a therapist must be able to monitor and direct the process at all times. That includes being able to quickly identify when ANS arousal is at a safe or dangerous level, and then having the knowledge and tools to quickly intervene to maintain emotional and physical safety as well as optimal integration of the treatment process where required.

To assist with the care necessary for effective and responsible trauma treatment, more precise tools are required to help practitioners in their work. They need to be able to assess the client's state of nervous system regulation from minute to minute, and repeatedly intervene to keep ANS arousal within manageable levels. Moreover, the therapist must constantly observe his own internal state lest a trigger, vicarious trauma, or countertransference overactivate his own nervous system. If that happens, it could render him incapable of the clear thinking necessary to conduct safe, precise, and effective trauma therapy. *No matter which method of therapy or trauma treatment you are using, being able to track your client's and your own arousal level will make the therapy safer for you both.* In this chapter, I hope to clarify questions such as:

- When is arousal at a level where integration is possible?
- How will I know when my client is on the verge of a freeze state so that we can avoid it?

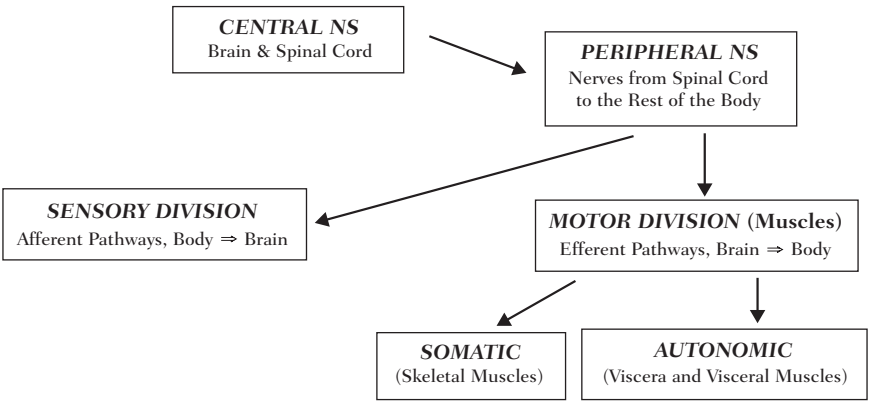
- When is it okay to continue what we are doing in the therapy?
- What would indicate it is time to put on the brakes?

Bottom line: The goal is to keep both the therapist and client thinking clearly and able to integrate and make sense of what is happening throughout the entire therapy session. First and foremost, that will help to ensure that the therapy is safe. In addition, monitoring ANS arousal will lay a foundation for optimum effectiveness of the therapy and achievement of short- and long-term goals.

REVIEWING THE ANS

The body's nervous system is understood as divided into multiple parts. The two main branches are the central nervous system (brain and spinal cord) and the peripheral nervous system, which contains the motor and sensory divisions. The sensory nervous system will be discussed in depth in the next chapter. The motor division is made up of nerves that communicate from brain to body (efferent) to stimulate muscles including the somatic part that activates skeletal muscles, those that move bones (such as bending your leg), and the autonomic part (the topic of this chapter) that regulates the viscera and visceral muscles such as the heart, lungs, and stomach. Below is a simple chart that illustrates these relationships (see Figure 2.1).

Figure 2.1. The body's nervous system.



Autonomic Nervous System: The Basics

The ANS was first named at the turn of the 20th century (Langley, 1903). Since that time, it has been widely acknowledged in physiology and neuroscience to be composed of two distinct branches: the *sympathetic nervous system* (SNS) and *parasympathetic nervous system* (PNS). It has been commonly accepted that SNS activation is involved in states of stress, from mild activation to the extremely aroused responses associated with threat: flight, fight, and freeze. The PNS, on the other hand, is most activated in states of rest and restoration. At times the SNS has also been referred to as *excitatory* or the *accelerator*, and the PNS as *inhibitory* or the *brake*. These two branches usually work in balance, like the arms on a scale of justice—when one rises, the other suppresses and vice versa. When, for example, the SNS is predominantly activated, the viscera and visceral muscles will be stimulated to send large amounts of oxygen to the muscles for quick and strong movement. That is why SNS arousal is characterized by increases in pulse and respiration, and also the reason that the mouth goes dry (no need for digestion when speed and strength are the priorities). Primary activation of the PNS is different. In that state the main concern is to send blood flow to the digestive system to absorb nutrition and to the skin to keep the body warm. To accomplish that, pulse and respiration slow, and the nervous system becomes calm. This simplified understanding of the ANS has been applied for more than a century. It is this theory that I learned when I was first studying the neurophysiology of trauma. While it makes sense and is useful to a point, it is also limiting.

Background

In my first book, *The Body Remembers*, Volume 1 (Rothschild, 2000), I began a discussion of *what to look for* in clients in order to increase the safety and precision of trauma treatment through more accurate regulation of ANS arousal. In that book, I adapted a fairly typical table for understanding the ANS. These types of tables are readily available in nearly every physiology book and in the images section of an online Google search. As is usual, that one has two columns, one for each of the two acknowledged (at that time) ANS branches: parasympathetic (PNS) and sympathetic (SNS). The observable characteristics listed under each branch reflected the most accurate indicators that were known and

speculated at the time of the book's publication, gleaned from basic physiology texts and the then most recent work of Peter Levine (1992, 1997) and Gordon Gallup (1977). It is reproduced below (see Figure 2.2).

In addition to that table, some pages later, I suggested guidelines for recognizing progressive states of arousal, from "relaxed" to "endangering."

- *Relaxed system:* primarily moderate activation of parasympathetic nervous system (PNS). Breathing is easy and deep; heart rate is slow; skin tone is normal.
- *Slight arousal:* signs of low to moderate PNS activation combined with low-level sympathetic nervous system (SNS) activation: breathing or heart rate may quicken while skin color remains normal; skin may pale and moisten slightly without increases in respiration and pulse, etc.
- *Moderate hyperarousal:* primarily signs of increased SNS arousal: rapid heart beat, rapid respiration, becoming pale, etc.

Figure 2.2. Autonomic nervous system (smooth muscles) (involuntary)..

SYMPATHETIC BRANCH	PARASYMPATHETIC BRANCH
Activates during positive and negative stress states, including: sexual climax, rage, desperation, terror, anxiety/panic, trauma	States of activation include: rest and relaxation, sexual arousal, happiness, anger, grief, sadness
Noticeable signs	**Noticeable signs**
Faster respiration Quicker heart rate (pulse) Increased blood pressure Pupils dilate Pale skin color Increased sweating Skin cold (possibly clammy) Digestion (and peristalsis) decreases	Slower, deeper respiration Slower heart rate (pulse) Decreased blood pressure Pupils constrict Flushed skin color Skin dry (usually warm) to touch Digestion (and peristalsis) increases
During actual traumatic event OR with flashback (visual, auditory and/or sensory)	**During actual traumatic event OR with flashback (visual, auditory and/or sensory)**
Preparation for quick movement, leading to possible fight reflex or flight reflex	Can also activate concurrently with, while masking, sympathetic activation leading to tonic immobility: freezing reflex (like a mouse, caught by a cat, going dead). Marked by simultaneous signs of high sympathetic and parasympathetic activation.

- *Severe hyperarousal:* primarily signs of very high SNS arousal: accelerated heartbeat, accelerated respiration, pale skin tone, cold sweating, etc.
- *Endangering hyperarousal:* signs of very high activation of both SNS and PNS, for example: pale (or reduced color) skin (SNS) with slow heartbeat (PNS); widely dilated pupils (SNS) with flushed color (PNS); slow heart rate (PNS) with rapid breathing (SNS); very slow respiration (PNS) with fast heartbeat (SNS), etc. (Rothschild, 2000, p. 111)

I received much positive feedback on the table and the guidelines. However, useful as these tools were, I was aware that there were still many situations that were not yet understood.

Over the last decades, I and my colleagues and students have done our best with what we had, but I always hoped that such a basic table could be bettered. However, until recently, I was just not sure how. And then, a couple of years ago, while updating multiple training program handouts, some "bricks" fell into place. I realized that some of the missing pieces might be filled in by *adding* important points from the alternative ANS theory proposed by Stephen Porges (2001, 2011). Many in the fields of traumatic stress studies, psychotherapy, and body psychotherapy have fully embraced Porges's *polyvagal theory*. My position is sort of middle-of-the-road. I see value in *both* the old and the new theories. Porges's view *adds* to and betters our ANS knowledge, but is not a complete replacement for the traditional views. This is one of those areas where, as mentioned in my disclaimer, disagreement fuels growth. No matter which side of the debate your opinion falls on, I hope you will be open to considering the advantages of a synthesis of the two rather than having to adhere to one or the other. Particularly with regard to my goal for this chapter, that is, sharpening the therapist's ability to observe and monitor the client's nervous system arousal—as well as to monitor his own arousal—integrating Porges's theory with the standard ANS theory is a huge advantage.

Porges's Polyvagal Theory

Steven Porges (2001, 2011) has made the single most progressive contribution to the understanding of the autonomic nervous system in recent times. There is a lot

to this theory, enough to warrant a book of over 300 pages. As a result, there is no way I will be able to discuss it in its entirety in this brief chapter. I will, therefore, be focusing on the points I have found most relevant to trauma treatment.

Porges's major theory concerns identification of separate actions of two distinct complexes of the vagus nerve on the ANS: the *ventral* branch (at the front of the body) and *dorsal* (at the back of the body). His theory has helped both researchers and practitioners to make better sense of what is happening in individuals when they are calm (ventral vagus) and when they collapse under the most extreme stress, threat to life (dorsal vagus).

Porges's theory challenges and expands the traditional scientific understanding of the ANS (per the chart previously discussed above). He has proposed that the vagus nerve has two separate branches that operate in distinctly different ways on the ANS. In his view, activation in the ventral branch of the vagus nerve associates to the action of the calming aspects of the parasympathetic nervous system. When the parasympathetic, ventral vagal, is most active, the nervous system is in a mostly calm state. Critical to Porges's theory, it is important to note that also in such a state, social engagement, that is, contact with self and others, is most possible.

On the other end of the spectrum, Porges ascribes activation in the dorsal branch of the vagus nerve to the extreme trauma response of flaccid-muscle freezing. He sees this dorsal-vagal freeze as a hypoaroused state connected to an excessive activation of the parasympathetic nervous system. The result is a dramatic shutdown of traumatic hyperarousal which leads to immobilization and collapse.

Reconciling the Old With the New

I, like many of my colleagues, have been struggling to reconcile and integrate these overlapping but differing views of ANS function for many years. I endeavor to view them as complementary rather than conflicting. And, primarily, I want to extract the most vital information from each to increase my understanding of what I see and hear when I am working with a client (and also sense in myself). To that end, I have completely revised and expanded the traditional ANS table. In doing so, it has become a new tool that can be employed to enhance the pre-

cision and safety of trauma treatment. I recommend using it to simultaneously monitor a client's and therapist's ANS arousal. The aim is to make possible a more nuanced and better-regulated treatment for the client and the reduction of adverse events for both therapist (vicarious trauma, compassion fatigue) and client (overwhelm, collapse, retraumatization).

SEXTUPLE ANS THEORY

Those older ANS tables that assign the characteristics of the two branches, the SNS and the PNS, are very limiting for those who work with traumatized individuals on a regular basis. To be able to precisely monitor clients and themselves, practitioners need to be able to identify a greater range of nuance that distinguishes levels of arousal *within* each of those branches. For example, PNS activation, which is usually thought of as a good thing—calm and restorative—can actually be dangerous if the PNS activates too high, and it can be very draining if the arousal goes too low.

In the hopes of solving many of the aforementioned ANS table problems (or, at the least, making a significant contribution in that direction), the following table represents an updated and integrated representation of the organization of the ANS. The best way to view it is in full color on the glossy foldout following page 38. I suggest that you put a placeholder of some sort with the table so that you can easily refer to it and follow along as the details are explained. Within the text I will reprint the line or column from the table that is under discussion so that you can see what I am talking about. However, those will be in black and white. You will need to refer to the table itself to see the associated color scheme being described.

The main purpose of this table is to help practitioners to specifically identify *what to look for* when observing ANS states in clients and in themselves. For the client this will mean increasing opportunities to reduce or even (eventually) prevent dysregulation, catching a rise in arousal *before* it gets out of control. For the therapist, it will make it possible to more accurately monitor her own arousal so that she can ensure her ability to think clearly and prevent vicarious trauma. The table also provides general guidance on how to intervene therapeutically depending on what is observed. Here it is in black and white:

Yellow *Green* *Blue* *Orange* *Red* *Purple*

AUTONOMIC NERVOUS SYSTEM: PRECISION REGULATION
** WHAT TO LOOK FOR **

		LETHARGIC Parasympathetic I (PNS I)	CALM Parasympathetic II (PNS II) *Ventral Vagus*	ACTIVE/ALERT Sympathetic I (SNS I)	FLIGHT/FIGHT Sympathetic II (SNS II)	HYP*ER* FREEZE Sympathetic III (SNS III)	HYP*O* FREEZE Parasympathetic III (PNS III) *Dorsal Vagus* Collapse
			"Normal" Life			Threat to Life	
PRIMARY STATE		Apathy, Depression	Safe, Clear Thinking, Social Engagement	Alert, Ready to Act	React to Danger	Await Opportunity to Escape	Prepare for Death
AROUSAL		Too Low	Low	Moderate	High	Extreme Overload	Excessive Overwhelm Induces Hypoarousal
MUSCLES		Slack	Relaxed/toned	Toned	Tense	Rigid (deer in the headlights)	Flaccid
RESPIRATION		Shallow	Easy, often into belly	Increasing rate	Fast, often in upper chest	Hyperventilation	Hypo-ventilation
HEART RATE		Slow	Resting	Quicker or more forceful	Quick and/or forceful	Tachycardia (very fast)	Bradycardia (*very* slow)
BLOOD PRESSURE		Likely low	Normal	On the rise	Elevated	Significantly high	Significantly low
PUPILS, EYES, EYE LIDS		Pupils smaller, lids may be heavy	Pupils smaller, eyes moist, eye lids relaxed	Pupils widening, eyes less moist, eye lids toned	Pupils very dilated, eyes dry, eye lids tensed/raised	Pupils very small or dilated, eyes very dry, lids very tense	Lids drooping, eyes closed or open and fixed
SKIN TONE		Variable	Rosy hue, despite skin color (blood flows to skin)	Less rosy hue, despite skin color (blood flows to skin)	Pale hue, despite skin color (blood flow to muscles)	May be pale and/or flushed	Noticeably pale
HUMIDITY	Skin	Dry	Dry	Increased sweat	Increased sweat, may be cold	Cold sweat	Cold sweat
	Mouth	Variable	Moist	Less moist	Dry	Dry	Dry
HANDS & FEET (TEMPERATURE)		May be warm or cool	Warm	Cool	Cold	Extremes of cold & hot	Cold
DIGESTION		Variable	Increase	Decrease	Stops	Evacuate bowel & bladder	Stopped
EMOTIONS (LIKELY)		Grief, sadness, shame, disgust	Calm, pleasure, love, sexual arousal	Anger, shame, disgust, anxiety, excitement, sexual climax	Rage, fear	Terror, may be dissociation	May be too dissociated to feel anything
CONTACT WITH SELF & OTHERS		Withdrawn	Probable	Possible	Limited	Not likely	Impossible
FRONTAL CORTEX		May or may not be accessible	Should be accessible	Should be accessible	May or may not be accessible	Likely inaccessible	Inaccessible
INTEGRATION		Not likely	Likely	Likely	Not likely	Impossible	Impossible
RECOMMENDED INTERVENTION		Activate, Gently Increase Energy	Continue Therapy Direction	Continue Therapy Direction	Put on Brakes	*Slam on Brakes*	*Medical Emergency* *CALL* PARAMEDICS

***Observe client states: To modulate arousal with brakes. Adjust in yourself: To think clearly & prevent vicarious trauma & compassion fatigue.**

 Sources: Multiple medical & physiology texts; P. Levine, 2010; S. Porges, 2011

How to View This Table

With this table I am hypothesizing six distinct (though overlapping) degrees of ANS arousal, three levels each within SNS and PNS: SNS I, II, III and PNS I, II, III. The left-to-right color scheme is inspired by both the United States' and United Kingdom's terror threat warning-level posters. They both use green to represent low or no threat, blue to stand for a state of guarded alert, orange to mean high alert, and red to warn of the most imminent severe threat. In the sextuple-ANS theory, those colors are used to indicate four of the graduated phases of ANS arousal response (see the horizontal row labeled Primary State). Yellow has been added to the far left column and purple to the far right column. Detailed explanations will follow.

	Yellow	*Green*	*Blue*	*Orange*	*Red*	*Purple*
PRIMARY STATE	Apathy, Depression	Safe, Clear Thinking, Social Engagement	Alert, Ready to Act	React to Danger	Await Opportunity to Escape	Prepare for Death

Yellow indicates a state of arousal that is too low, a type of *hypoarousal*, though this low-energy state is *not* the result of traumatic stress. Green represents the ANS in a state of safety and calm. Blue designates the rise in arousal that is needed to meet the demands of daily life. Orange represents arousal response to perceived or actual threat that one can fight or flee. Red indicates an activated freeze state that may, eventually, allow escape. Purple specifies the most dire situation when threat of death appears to be imminent and complete overwhelm results in collapse, which is a second (and more recognized) type of hypoarousal. (The two types of hypoarousal will be discussed in more depth below.)

With this new table I am hoping to resolve difficulties and fill in gaps that are not addressed with the standard two-column ANS chart. As discussed above, the SNS and PNS are activated, to varying degrees, in both desirable and undesirable states. For this reason, I have added labels at the top of the table, one to indicate that the arousal levels of PNS II and SNS I are associated with *normal daily life* and that SNS II, SNS III, and PNS III are associated with *threat to life*. That appears as below in the table:

	Yellow	*Green*	*Blue*	*Orange*	*Red*	*Purple*
	LETHARGIC Parasympathetic I (PNS I)	**CALM** Parasympathetic II (PNS II) *Ventral Vagus*	**ACTIVE/ALERT** Sympathetic I (SNS I)	**FLIGHT/FIGHT** Sympathetic II (SNS II)	**HYPER FREEZE** Sympathetic III (SNS III)	**HYPO FREEZE** Parasympathetic III (PNS III) *Dorsal Vagus* Collapse
		"Normal" Life		Threat to Life		
PRIMARY STATE	Apathy, Depression	Safe, Clear Thinking, Social Engagement	Alert, Ready to Act	React to Danger	Await Opportunity to Escape	Prepare for Death
AROUSAL	Too Low	Low	Moderate	High	Extreme Overload	Excessive Overwhelm Induces Hypoarousal

People with normally regulated nervous systems and life situations routinely swing between low and moderate levels of arousal depending on whether they are at rest (eating and digesting, hanging out with friends, sleeping) or are mildly stressed with everyday kinds of situations or demands (cleaning house, meeting a deadline, running a race, having sex) and so on. The stress of moderate challenges such as conflict with a spouse or a work dilemma would usually fall within the blue SNS I. It is only during exceptional situations where there is a threat to life or limb that an individual moves into higher arousal states represented by the orange SNS II (*high*), red SNS III (*extreme overload*), and purple PNS III (*excessive overwhelm*) columns. It is these *rare* situations that we call *traumatic*. Arousal in the *threat-to-life* range dysregulates and pushes the ANS to the reactions of flight, fight, and freeze. On the other end of the spectrum, the yellow PNS I column represents a state where arousal is too low to function well. Depression, apathy, lethargy, chronic fatigue, and such would fall into this category. The PNS I column does not fall under either the "normal life" or "threat to life" banner because it does not qualify; it is a state unto itself.

I am hoping that dividing the SNS into three stages of increasing arousal will clarify some of the confusion about how the SNS could be involved in both desirable kinds of stress (such as having sex) and likewise in the most horrible types of incidents (such as assault). Identifying three levels of SNS arousal helps to distinguish these differences. It can also help a therapist to notice when arousal is on the rise and may be moving into a zone that could threaten her own or the client's clear thinking, or worse. Likewise, dividing the PNS into three stages should help to illustrate the extreme difference between desirable PNS II activation and life-threatening PNS III activation.

Of course the lines and colors dividing the columns are not meant to represent rigid boundaries. And within each column the range of arousal can vary. For example, within the blue column might be response to demands that require very little arousal, say working in the garden, to situations that stimulate fairly high, though not hyperarousal, for example a failed house sale or dealing with major plumbing problems. That overlap and progression are represented in the row labeled Primary State by the rainbow graduation of color changes throughout the six columns from yellow at the far left to dark purple at the far right. You will note, for example, that the color in the blue SNS I column fades from greenish-turquoise at the left of that column through pure blue in the middle to a darker blue mixed with a little orange at the right.

Keeping with the goal of the chapter, that is, guiding helping professionals in *what to look for* to be able to gauge arousal in clients and themselves, each column includes a list of typical physical states (on the buff-colored background) that coincide with each level of arousal. Look, for example, at the row labeled Heart Rate:

	Yellow	*Green*	*Blue*	*Orange*	*Red*	*Purple*
HEART RATE	Slow	Resting	Quicker or more forceful	Quick and/or forceful	Tachycardia (very fast)	Bradycardia (*very* slow)

Slow pulse in PNS I yellow, resting pulse PNS II green, and the quick or forceful pulse when threat is involved indicates SNS II orange. Scanning across the row labeled Integration in the cognitive and emotional states section (on the light gray background), you will see:

	Yellow	*Green*	*Blue*	*Orange*	*Red*	*Purple*
INTEGRATION	Not likely	Likely	Likely	Not likely	Impossible	Impossible

This means you can anticipate when your client is calm (green) or moderately activated (blue) that cognitive integration will likely be possible, and so on.

Likewise, each column indicates probable observable physical, cognitive, and emotional states associated with that level of arousal. Read down the orange Flight/Fight Sympathetic II column:

		FLIGHT/FIGHT Sympathetic II (SNS II)
PRIMARY STATE		**React to Danger**
AROUSAL		**High**
MUSCLES		Tense
RESPIRATION		Fast, often in upper chest
HEART RATE		Quick and/or forceful
BLOOD PRESSURE		Elevated
PUPILS, EYES, EYE LIDS		Pupils very dilated, eyes dry, eye lids tensed/raised
SKIN TONE		Pale hue, despite skin color (blood flow to muscles)
HUMIDITY	Skin	Increased sweat, may be cold
	Mouth	Dry
HANDS & FEET (TEMPERATURE)		Cold
DIGESTION		Stops
EMOTIONS (LIKELY)		Rage, fear
CONTACT WITH SELF & OTHERS		Limited
FRONTAL CORTEX		May or may not be accessible
INTEGRATION		Not likely
RECOMMENDED INTERVENTION		**Put on Brakes**

The primary state is *reaction to danger*; arousal is *high*; muscles are *tense*, and so on down the column. The bottom row includes a *recommended intervention*, which in this case is to *put on the brakes*. In the same way, each column highlights the characteristics associated with that arousal level. When looking at your client, or monitoring your own internal state, observations that primarily fit in the one column or another will guide you in identifying current arousal level and also give you a recommendation for how (or if) to intervene.

Two Categories of Freeze

It is generally agreed that when faced with threat to life, both animals and humans assume a *state of freeze*, that is, the organism becomes completely muscularly immobile, with diminished awareness. For a long time, it has been believed that the freeze state is a single condition (Gallup, 1977), even though in some situations the immobility appears with muscle stiffness and in others with muscle flaccidity. However, increasingly in the last decade or so, I and some of my colleagues have been wondering if there might be *two* functionally different states of trauma-induced freeze. Porges (2011) has certainly contributed to the understanding of the flaccid muscle collapse. But what about the stiff muscle paralysis? I have represented two possible differing states of freeze in the red SNS III column, indicating a hyp*er* freeze state where muscles are rigid and heart rate is very fast, and the purple PNS III column representing the hyp*o* freeze state where muscles are flaccid and heart rate is very slow. Because differing actions of the PNS are involved in the yellow lethargic, green calm, and the purple hypo freeze/collapse states, they are distinguished as PNS I, PNS II, and PNS III respectively.

It is believed that traumatic freeze states serve at least two purposes. *Hyper freeze*, in the red SNS III column, is common in the wild when, for example, a deer or kangaroo becomes stiff in a car's headlights or a predator catches up to its immobilized prey. Hyper freeze appears to be a survival strategy since a stiffly motionless prey might appear to the predator to be dead. *If*, as a result, the predator then abandons the prey, it may have a chance to quickly revive and escape. The other type of freeze, *hypo freeze* in the PNS III purple column, may serve as a preparation for death by dampening consciousness and reducing perception of pain. The PNS III hypo freeze state is also sometimes referred to as *hypoarousal*.

Let me give you examples of how these two states of freeze might look in the therapy room. But first a caveat: It is best to avoid freeze states altogether as they are not therapeutically beneficial. When clients' activation goes that high, they are seriously at risk for retraumatization, decompensation, and even, possibly, actual death. This is a major reason why monitoring the ANS is so important, to be able to catch and reduce arousal before it rises to such a dangerous level.

Clients in (or approaching) an SNS III hyper freeze state will become immobile from tensed muscles. (Think of my client, Grete, described at the beginning of this chapter.) They may look stiff in the chair. Their facial expression will become decreasingly mobile; breathing will become more rapid; and their pupils will dilate. They may be able to respond to questions, but thinking will not be clear. In this situation, the best response is to *slam on the brakes*. That is, do whatever you can to reduce stress and provocation. That might mean insisting on contact with exteroceptors (per the next chapter), or, perhaps, moving your chair to give more space. Firm reassurance that the client is with you and not at the scene of the trauma should also help.

First responders and those who work in hospital emergency rooms will likely see someone collapse in a PNS III state, but it is rare during trauma treatment. I have never witnessed this in therapy myself. The only situations I am aware of where hypo freeze has occurred during trauma therapy were the result of clients being forced to face memories of near-death experiences without any preparation, grounding, resourcing, development of therapeutic relationship, and so on. Hopefully, that means that anyone practicing even the bare minimum of safety precautions will likely avoid such a calamity. However, it is certainly possible, depending on where you work, that an individual could arrive in the immediate aftermath of, for example, a car accident, being raped, a shooting, and so on. In that type of circumstance, hypo freeze is definitely possible. You will recognize this dangerous situation if the client collapses or faints with muscles flaccid (instead of stiff). If you check the pulse, you will likely find it *very* slow. Hypo freeze immobility is actually a potentially life-threatening situation. The only responsible intervention is to call for paramedics and remain with your client until they arrive.

The understanding of hypoarousal does not stop here. In the next section I will be proposing that there are two distinct categories of what is often referred to as hyporarousal.

Two Types of Hypoarousal

I have a confession: For a long time I rejected Dan Siegel's (1999) concept of a *window of tolerance* because everything I read, saw, and heard in discussions confused me. Generally, hypoarousal has been thought of as one thing, a collapse that is the result of dorsal-vagal stimulation, an extreme PNS arousal. I do agree with that and have represented this state in the purple PNS III column. Despite the knowledge that such a collapse was the result of some kind of extreme threat to life, the commonly recommended intervention has been to stimulate and energize the collapsed person in an effort to bring him or her out of that state. That recommendation has never made sense to me and I have seen it have adverse results. If someone is collapsed in terror, completely overwhelmed, why add more provocation? Recently, another of those bricks fell into place. I realized that there may be a confusion between the low energy of PNS III collapse and a lethargy or withdrawal that might result from chronic (though *not* traumatic) stress, depression, bereavement, apathy, and the like. So here is another hypothesis: There are *two* distinct types of hypoarousal. The one is, as described above, the result of over-the-top PNS III traumatic arousal that causes a possibly life-threatening collapse. In addition, there is a second type of hypoarousal that is *not* the result of trauma, but is akin to apathy or lethargy, perhaps a kind of giving up. I have represented this non-trauma-related hypoarousal on the ANS table in the first, PNS I yellow, column.

There is a critical difference between the low energy of someone who is very sad, aggrieved, or depressed, and the state of hypoarousal collapse that may occur during or in the immediate aftermath of a life-threatening event or, more rarely, in one suffering from severe PTSD. The first one, PNS I, is the result of a deficit of energy. PNS III hypoarousal is, on the other hand, the result of overwhelming arousal which causes a nervous system shutdown that leads to collapse. PNS III hypoarousal is the result of arousal going *over the top.* Thinking in those terms will help you to distinguish that as a state of excessive overwhelm rather than an absence of vigor.

Here is a computer analogy that will help to make this distinction. I am going to compare the PNS III hypo freeze state of hypoarousal to the all-too-common computer crash. A computer crash can occur for a myriad of reasons, the three most common are:

- Too many programs or applications running at the same time, overwhelming the operating system.
- The hard drive becomes too full, causing overload.
- An electrical surge blows out the system or precipitates a protective shutdown.

Consider the PNS III hypoarousal collapse as similar. Neither is the result of too little arousal, energy, or movement. They are both precipitated from *too much* of something. In the case of the computer, it is too much data or electricity. PNS III hypoarousal collapse follows SNS III hyperarousal when the threat becomes so intense that death may be imminent. Neither of these situations (human or computer) will be eased by increasing activity, load, or charge. You would not want to further overload an already overloaded computer system. What the computer needs is some sort of reduction in activity, data, or electricity. Likewise, for PNS III hypoarousal, someone in that condition needs a *reduction* in the level of provocation and threat that they are under, feeling, or perceiving, not more.

PNS I hypoarousal, the one that stems from a lack of verve, is more akin to a computer battery that has lost charge or a slowdown because the Wi-Fi signal has dropped off. In these cases, some kind of energy boost would be necessary and appropriate. The same goes for lethargic people. Increasing their energy would be in order, so long as it is gentle and well-paced (Brantbjerg, 2008).*

One critical key to differentiating between these two states of low energy is to pay attention to what, exactly, *preceded* the hypoarousal: Is the person tired? Is this the result of a chronic or acute depression? Or, instead, has arousal been on the rise? Has the person just experienced a traumatic event? Was there provocation from a trigger or an episode of flashback? These are among the important questions to be asking before choosing an intervention. The PNS I state needs gently increased stimulation; PNS III requires reduction in stimulation. It will also be critical to note if the person is conscious, in contact, has fainted, and so on. In the case of fainting or losing consciousness, check the pulse. Is it fast or slow? A reminder: If this is a hypo freeze collapse, the safest intervention is to call the paramedics.

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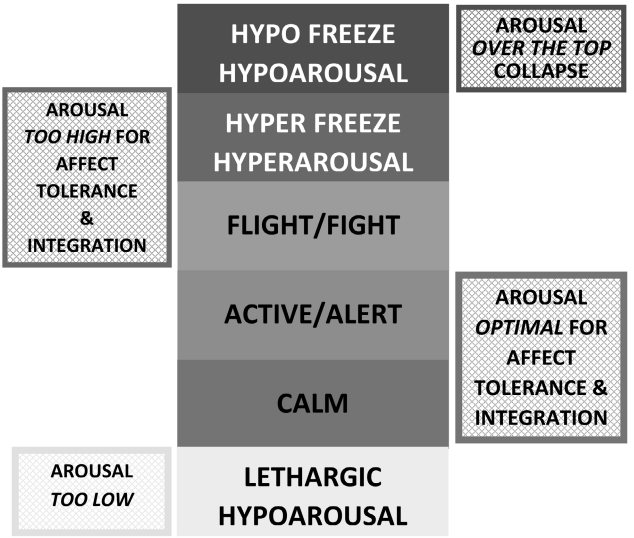
* Merete Holm Brantbjerg has an understanding of, and skill in working with, the lethargic, low energy, state like no one else to my knowledge. I highly recommend this rare article as there is nothing even close to it available, at least that I could find.

Figure 2.3. Window of affect tolerance and integration.



To further illustrate the difference between these two types of hypoarousal, I have drawn a second view of the ANS table on its side and have integrated some of the concepts from the *window of tolerance* proposed by Daniel Siegel (1999) and popularized by Pat Ogden and colleagues (2006) (see Figure 2.3). A full-color version of this table is also viewable on the glossy insert following page 38.

As you can see from this chart, hypo freeze hypoarousal *arises* from increasing threat and arousal until those become so massive and severe that the body collapses, literally *over the top*. On the other end, the lethargic hypoarousal state is, literally, on the low end of the arousal scale. In that instance arousal is just too low.

Emotions and the ANS

Reading across the Emotions (Likely) row, you will notice that most of them are assembled into the yellow PNS I, green PNS II, and blue SNS I columns. This is because the usual range of human emotions (sadness, pleasure, love, shame, disgust, anger, anxiety, and so on) coincides with the lower ranges of ANS arousal. Rage, fear, and terror are all extreme emotions that are associ-

ated with the more highly stressed states of orange SNS II, red SNS III, and purple PNS III.

	Yellow	*Green*	*Blue*	*Orange*	*Red*	*Purple*
EMOTIONS (LIKELY)	Grief, sadness, shame, disgust	Calm, pleasure, love, sexual arousal	Anger, shame, disgust, anxiety, excitement, sexual climax	Rage, fear	Terror, may be dissociation	May be too dissociated to feel anything

I had the greatest difficulty, as well as the most colleague discussions and online searching, in placing the emotions of shame and disgust. For the first, there is little discussion or research on the association between emotions and the ANS. Those who research the neurophysiology of emotion appear to be more concerned with what is happening in the brain than in what it feels or looks like in the body. Therefore, this is an area where anecdotal and personal experience had to be my main guide. Consensus among my colleagues gleaned from client and self-observation as well as the limited available literature led to the conclusion that disgust and shame had features of both yellow PNS I and blue SNS I. Perhaps when I am or someone else is ready to update this table, there will be additional or clearer research to guide more accurate placement of these emotions.

How to Use This Table

Each of the six levels of ANS arousal is represented by separate columns. Reading from left to right, the level of arousal increases with each step: PNS I, PNS II, PNS III, SNS I, SNS II, SNS III, and PNS III. Likewise, when reading from right to left, arousal is decreasing. Down the left side of the table are listed common features that, in varying degree, help to evaluate which arousal level is currently active. Physical indicators are on a light yellow background, and cognitive and emotional indicators are on a light gray background, for example, if you read down the list of features to the indicator of Muscles then follow that across the columns to the right:

	Yellow	*Green*	*Blue*	*Orange*	*Red*	*Purple*
MUSCLES	Slack	Relaxed/toned	Toned	Tense	Rigid (deer in the headlights)	Flaccid

Under the heading of yellow PNS I the muscles will likely be slack; in green PNS II the indication is that muscles in that state will be relaxed; under the heading of blue SNS I, muscles will be toned; when the arousal is at the orange SNS II level, muscles will likely be quite tense; and when arousal is extremely high—inducing a state of freeze—the muscles could either be very rigid (red SNS III) or completely flaccid (purple PNS III).

When the physiological, cognitive, and emotional indicators on this table are committed to memory, it becomes possible to quickly identify what is happening in a client and in oneself. (However, do not worry if memorization of this sort is not in your skill set. You can always refer to the table.) Some of the characteristics are easy to identify through visual observation: nuances of skin tone (no matter the base color of a person's skin), variations in pupil size, and differences in breathing patterns. Others require inquiry (asking clients if they can identify the speed of their pulse, feel the temperature in their hands and feet) and listening for which emotions are being named or expressed during the session. In this way the table can become a treatment tool of value to aid modulation of the therapy session, keeping the pace and stimulation within parameters that the client can manage and integrate. Likewise, learning these characteristics and how they feel in your own body will make it possible to monitor your own arousal level, enabling you to keep it in a range where you are alert and able to think clearly.

Something as detailed as identifying ANS characteristics can be difficult to weave into already demanding situations of trauma treatment. Changing your therapeutic routine to include attention to such factors can be challenging. When I was first learning to identify ANS signs in my clients and myself, I had particular difficulty remembering to notice what was happening. I solved that hitch by taking a file card and drawing a big ANS on it in bold red letters. I stuck it on the wall behind the chair where my clients usually sat. It was hard to miss and helped to remind me to check on my own and my client's ANS arousal during sessions. Most clients ignored my sign. But a few asked what it meant or what it was for. The discussion that then resulted was usually rich for the client and for me. We furthered a stronger partnership as the clients also gained knowledge and skill in identifying ANS arousal in themselves. And once in a while one would surprise me with an observation of my arousal state! Unnerved at first, I became accustomed to and eventually looked forward to my clients being able to gauge my arousal. It meant they had gained a tool for themselves to use, not only in the session, but in their daily lives as well. Not a bad idea to be able to gauge the arousal in another, for example, while confronting a difficult issue. For many that can be very empowering. And, periodically, I would introduce the ANS to a client who had not noticed the sign because it seemed she might benefit from that bit of knowledge. If dealt out in digestible portions, it can be useful information for just about anyone.

Once you are able to identify the current state of a client's (or your own) arousal, you will be in a much better position to intervene to modulate the arousal level. Often (but not always) that could mean *putting on the brakes*, slowing things down, grounding, and so on to reduce arousal to a lower, safer level, one where clear thinking is optimized.

I have now presented and taught versions of this updated ANS table to a good many groups of trauma therapists during large training lectures and smaller training programs around the world. The response has been exceedingly positive. From the anecdotal feedback I have received to date, it appears this new ANS table facilitates a more accessible and useful conceptualization of what a therapist sees in a client and observes in herself. Trainees have spontaneously begun to describe their own and client states within the color scheme:

- "I am feeling mostly in the green right now, calm and clear thinking."
- "Now I understand that my difficult client is mostly in the orange during sessions. That must be why he is not remembering what we did."
- "When I am working I am usually moving between green and blue."
- "What do you do for a client who suddenly shoots into the red?"

In this way, they have told me, they can much better see the differences between arousal levels, and immediately understand the meaning because of the color associations. And more than one psychiatrist has told me they wished they had such a clear and comprehensive tool in medical school.

MAKING SENSE OF MONITORING THE ANS IN PRACTICE

I know from my own experience that no matter how accessibly presented, learning and digesting the complexities of the ANS can be a lot to absorb, organize, and remember. In an effort to help with that, below I will narrate an example of what putting this knowledge to use might look like in practice.

My client, Jennifer, arrives late. She seems in a rush and her skin tone is pale and her pupils are dilated. When she sits I can see her breathing is shallow but quick. Her muscles are tense and shaking and she looks ready to bolt from her chair. Upon inquiry, she responds that she is feeling "very scared."

These are signs of high arousal, corresponding to the Flight/Fight orange SNS II column. I do not dare ask her what is upsetting her as I predict that either she would be unable to reply or that encouraging her to think about what is distressing her could drive her arousal even higher. I decide to help her *put on the brakes*. I first fall back on my "go to," which is to encourage mindful body awareness and ask what she notices in the hope that paying attention to her body sensations right now will help to ground and calm her.

In a quavering voice Jennifer tells me that her hands and feet are cold. But when I ask about her heart rate, she becomes unable to speak and just pats her chest rapidly to show me that it is beating fast. Though her face remains pale, her ears begin to flush.

Of course, no intervention or strategy works for everyone, nor even every time with the same person. I become concerned that asking about her body has driven her arousal even higher. She is now edging into the hyper freeze, red SNS III state. Sometimes using body awareness can be a way to gently put on the brakes, but not always. In this instance, that strategy has further destabilized her. I realize that if I am to prevent her from becoming completely frozen, I must *slam* on the brakes using a different strategy. Since body focus increased her dysregulation, I decide to move away from that and have her turn her attention to me and the room, drawing on her exteroceptive sensory system (per Chapter 3), helping her to focus outward rather than inward.

I ask Jennifer to identify the color of my hair, the time on the clock, and the number of flowers in the vase. In addition I direct her to notice the noise outside the window. She is able to follow all of these directions. As she does, her breathing starts to slow, she sits back in her chair, and her tense shoulders drop slightly.

These responses tell me her arousal is easing back to orange SNS II and starting to move toward the Active/Alert blue SNS I. Not there yet, but on the way.

Encouraged, I ask Jennifer if I am doing anything that is frightening her. She tells me no, "but you must not come closer."

The fact of that considered reply tells me that she is becoming able to think clearly and speak in her own defense. That indicates she is even more into the blue SNS I than I had realized.

I want to take advantage of her increased clarity and ask if I should move my chair back to give more space between us. She tells me she doesn't know if it matters, but it might be good to try. When asked how far I should move she indicates about one foot (30 centimeters). Once I have scooted backward, she takes a long breath and exhales deeply, almost like a sigh. I draw her attention to this and she affirms, "It's easier to breathe when you are not so close."

That deeper, slower breath also tells me that her arousal has come way down, fully in the blue SNS I and on the way toward the green PNS II of calm. We work in a similar vein for a few more minutes until I can see by all somatic indicators that she is, indeed, PNS II calm (green), and that she experiences that also. It is useful for Jennifer, as for most traumatized individuals, to be able to experience what calm actually feels like. Some have forgotten; others have rarely, if ever, experienced calm. Developing a *somatic marker* (Damasio, 1994; see Chapter 6 for a detailed discussion) for calm is like establishing a safe home base. She will now know what to aim for to be able to think clearly and function better.

This process has taken up merely the first 8 minutes of the session. With her nervous system calmed and her cortex fully available, she is now in a good position to be able to make sense of what was distressing her when she first arrived. We agree to address this and I continue to monitor her arousal in the same way, keeping her as much as possible in the green PNS II calm and blue SNS I active/alert areas (calm and moderate arousal) so that she can make use of and integrate what we are discussing.

Periodically, while working with Jennifer (and, hopefully, all of my clients) I am also monitoring my own arousal levels. It is important that I keep my own activation in check, in the green PNS II calm and blue SNS I active/alert areas so that I, too, can think clearly. If I let myself become overly activated, dysregulated into flight/fight SNS II orange or worse, I will not be of any use to my client. Further, I could risk vicarious trauma or decompensation myself, neither of which would do me (or my client!) any good at all. Likewise, if I succumb, for example, to tiredness or grief over a recent loss, I could sink into the PNS I

lethargic state where clear thinking is also compromised. So when I am checking on Jennifer's arousal, I'm also, at least some of the time, checking on my own as well. When she first arrived in that distressed state, I could feel my own heart rate go up and my hands cooled. As she calmed, my pulse slowed and my hands warmed up, so I knew I had resonated with her distress and then was calming as she did. It is not always the case that the therapist's arousal level will mirror the client's, though it is a common phenomenon. This is one of the reasons to monitor yourself. If my client's arousal had not come down, it would not do either of us any good for mine to also remain high. I would need to intervene with myself to reduce the resonance (which will be discussed in Chapter 8) so that my arousal level would reflect my own state and not my client's. However, the therapist can become triggered in his own traumatic past (many, if not most, trauma therapists are wounded healers), another reason for keeping tabs on one's own state. It can be critical for keeping one's personal history contained and out of the way of the client's therapy.

SUMMARY

Though the tables and hypotheses discussed here are concerned with observable parameters, they have not been confirmed through rigorous research. Nonetheless they are still clinically useful. As stated in the disclaimer at the beginning of this book, these are my best, current approximations. I hope that I and others will continue to improve on them. There are many topics discussed in this chapter that could benefit from further study.

Paying attention to arousal levels per the ANS table and intervening to maximize calm and integration will ensure that a client is able to maintain contact and relationship with himself and with the therapist—a prerequisite for safe trauma treatment.

When working with traumatized individuals, I am always tracking and then regulating what is happening in the ANS of my client and myself. The same goes for all of the illustrative demonstration sessions that are transcribed and annotated in subsequent chapters. Where appropriate, I will include those observations in the notes that accompany those transcripts.