Lærebog i Kranio-Sakral Terapi

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The importance of improving breathing capacity: It can be helpful for some autistic children

KAPITEL 24

One of the advantages of heading a large school of body therapy and cranio-sacral therapy is that I have professional contact with many teachers and practicing therapists. People tell me about useful applications of techniques that they have discovered, many of which I did not know before. Often, after I hear something, I say to myself, "Of Course" and think that I should have known that.

The mother of an 11 year old boy started taking courses with us. Her son, Jakob, had been diagnosed as autistic with compulsive, repetitive behavior. For example, before he started receiving treatments, he washed his hands 100 times a day, ate by himself in his room, broke his toys and hit himself. He often walked back and forth restlessly for hours. He did not play with other children.

The prognosis from the health care system was that there was no hope that his condition would improve. They instructed his family to treat him in ways that make things run as smoothly as possible for everyone. They were not offering any treatments that helped him directly with his condition.

Then, about a year and a half ago, he had his first session in our form for cranio-sacral therapy, the Social Engagement Protocol. His very first treatment helped him tremendously. To all intents and purposes Jakob began to function normally.

The first three treatments that Jakob received improved his function to 80% of what is normal for a boy of his age. His hand washing went down to 20 times a day, he ate with the family and he started to play with other children of his own age. He stopped hitting himself and breaking his things.

The treatments kept him in balance for about two months at a time. Then he needed another treatment to get him functioning normally again. (You can see a video of the effects of the treatment on our web site at www.stanleyrosenberg.com or at www.bodyhelp.dk.)

The treatments for Jakob had been so remarkably effective that improvement was noticed not only by his mother and the teachers at his school, but also by the doctors at Glostrup Hospital (in Copenhagen, Denmark) when he came in for his annual check-up. The staff was both surprised and impressed. They invited his cranio-sacral therapist, Henrik Bruhn, to meet with them and to tell them what he had done that had helped the boy so much.

Our cranio-sacral approach is based on techniques from the French osteopathic tradition as developed by Alain Gehin. The selection of techniques and evaluation of our methods was inspired by a new understanding of the function of the autonomic nervous system. The Polyvagal Theory was first presented by Dr. Stephen Porges (USA) in 1994.

Most of the diagnoses of autism, Asperger, DAMP, hyperactivity, etc. are based on careful observations of the patterns of behavior. The Polyvagal Theory gives us insight to help us to understand the differences between normal and abnormal behavior, but rather than looking at the surface, at the behavior, we get a glimpse of the underlying physiology.

Dr. Porges postulates that normal, social behavior requires the proper function of five cranial nerves. We will look at these five cranial and their functions at the end of the article.

Jakob's mother is a teacher in special education working with handicapped children. She was so excited by the improvements in her son that she started taking courses with us. Recently, Jakob exhibited signs of starting into a bad period again. Susanne had come far enough along in her own training that she had growing confidence in her own ability as a cranio-sacral therapist. Rather than making an appointment with his cranio-sacral therapist, she decided to try to treat him herself.

She noticed that his neck was tight. She told me that the restriction was at the level of C3-C4 (the middle of his neck). She worked with a very light touch on the skin of the neck over the 3rd and 4th vertebrae of his neck. She was stimulating the nerve endings in the skin (dermotomes). Suddenly, after a minute or two, his breathing got better and he popped back up to functioning normally.

Her story made a lot of sense to me. The phrenic nerve to the respiratory diaphragm comes from the neck at the levels of C3, C4 and C5. We work with a technique at C3 and C4 in our KST VII course. But she had not taken that course yet. On her own, she discovered the possibilities of working in the skin (dermatomes) at that level of the cervical spine.

She saw that his breathing improved immediately and was again involving the respiratory diaphragm. He popped out of his negative, withdrawn, self destructive, compulsive state. The symptoms which had plagued him disappeared and his behavior was again normal.

What was new for me was the insight of how important a simple change of improved breathing can be for children with problems. For years, I started my treatments of children with developmental and behavioral problems at the atlanto-occipital joint (C0-C1) and continued with several techniques on the sutures between the occiput and the temporal bones. This restored function in the vagal nerve. I got such a major improvement in their general condition including breathing that I usually stopped with these techniques without thinking of treating the phrenic nerve at C3 and C4. Therefore, I was surprised by her discovery, that in her son's case, working at C3 and C4 was enough on its own to make the important shift in his nervous system.

In retrospect, her discovery makes perfect sense. To be socially engaged, a person has to feel safe. If the person was being choked and could not get enough air, then they will sense that they are in

serious danger or in a life threatening situation. If someone was choking them, they would respond by fighting that person, or trying to get away, or going limp (parasympathetic) to conserve energy.

But what can they do if their lack of oxygen stems from a dysfunction of a nerve in their own body? Who can they fight? Where can they run to?

In addition to the social engagement protocol which usually improves function in the vagal nerve, I will now include working C4 to ensure proper function of the phrenic nerve in my treatments of children with special needs.

From the premise of osteopathy, that "structure can affect function", a rotation of the vertebrae of the neck at the levels of C3 and C4 could put a pressure on the tissue surrounding the spinal nerves C3 and C4. This can reduce blood supply into the connective tissue sheath (perineural tissue), which surrounds the spinal nerves. This in turn could reduce the blood supply to the nerve cells resulting in dysfunction of the target muscle, in this case the respiratory diaphragm.

In India, there is a tradition which goes back at least 4000 years of teaching breathing exercises, pranayama. By working with different patterns of breathing, people can regulate their autonomic nervous system and change their emotional state: they can enhance social behavior, and reduce aggressive behavior (fight), fear (flight), or withdrawal (apathy and helplessness).

In religious dance, meditation and other practices in spiritual traditions in other parts of the world, there is a similar awareness of the power of breath and movement to affect emotions. In China, people practice tai chi and chi kung to cultivate their "chi", in Japan, people practice techniques to increase their "ki" – in the middle east, several traditions promote increasing "kath". In our modern Western culture, in order to reduce stress, people are often advised to "take a deep breath, relax and let go of the tension".

But what if people cannot physically take a deep breath with their respiratory diaphragm because of dysfunction in their phrenic nerve?

Normal breathing can be observed when most people sleep. There is a steady, uninterrupted rhythmic fluctuation between breathing in and breathing out.

When people are awake and mentally concentrating, or when they are in emotional states of stress or withdrawal, their breathing changes from this relaxed pattern observable during sleep. When people sit at a computer, attend a meeting, or concentrate intellectually they often hold their breath.

People in stress states generally hold their breathing on an in-breath. Anger is generally held in the belly. People feel pumped up, ready to explode. Fear is usually accompanied by holding the in-breath in the upper chest by lifting of the upper ribs (high costal breathing). In both fight and flight, people have a hard time breathing out and letting go.

When people are depressed (predominantly parasympathetic activity), they generally hold their breath on an out-breath. They have difficulty breathing in. They literally have difficulty being inspired.

One interpretation of the difference between "normal" and "abnormal" behavior has been described in a paper by Stephen Porges, "Neuroception". Neuroception is the response of our nervous system to meet the challenges and possibilities of our environment to help insure our survival. If our nervous system functions normally we will respond appropriately to three different kinds of situations: 1) where we feel safe, 2) where we sense that we are in danger, or 3) where we anticipate that we will soon be overwhelmed by a life threatening event.

Our behavior should be able to shift immediately if there is a shift in our environment. In situations of safety, we can be open, friendly, loving, and socially engaged. We enjoy being with family and friends. We do not have to do anything. We can be immobilized. We have nothing to fear. Together with someone else, we can watch the sun set, or look at the flames in a fireplace – quietly, without needing to talk, but yet sensing the feeling of togetherness.

If the safe situation changes and we are suddenly in danger, then it could be life-saving if we entered a stress state and were mobilized for fight or flight. And if we are suddenly overwhelmed by life-threatening situations, we might go limp, feigning death immobilized by our fear and terror.

To maximize our chances for survival, we should be able to modulate our behavior to respond appropriately to situations of safety, danger or overwhelming threats. This movement up and down the scale of emotional responses requires flexibility in our nervous systems.

If this flexibility is lost, then the person can get stuck in a state of stress (fight/flight) feeling aggressive or anxious or a state of withdrawal feeling overwhelmed, hopeless and helpless. The person can no longer move freely up or down the scale of possible physiological and psychological responses.

People who are in chronic stress are "stuck" in mobilization from fear or anger. People who are "depressed" are "stuck" in immobilization with fear. People, who are chronically stressed or in chronic apathy, are not able to get back up to the level of social engagement, even when there is no real, external threat to their survival. Objectively speaking, they are "safe", but because of inflexibility of their nervous system, they do not feel safe. They do not always respond normally or appropriately. They might respond to a friendly, loving and open communication with hostility, anxiety or withdrawal.

In our other articles on social engagement, we have stressed the importance of the function of Cranial Nerves V, VII, IX, X and XI. But in this article, we consider another possible physiological cause for a lack of flexibility of response. There could be a dysfunction of the respiratory diaphragm, due to pressure on the nerve roots C3-C4.

If the children have not breathed properly for a long time, or in many cases for their entire lives, then their tissues can be depleted of oxygen (low oxygen pressure, i.e. low PO2). The brain gets its metabolic energy from both oxygen and sugar. Lowering of oxygen levels in the blood can reduce brain function. They might become lethargic because of a lack of energy – or they might become hyperactive, because activity would be better than sitting still as a way to get the body to breath and to get oxygen to the brain.

Measuring PO2 levels is done routinely in operations. If the level falls below a certain level, the anesthesiologist will administer oxygen to the patient.

On airplanes, the level of atmospheric oxygen is controlled. Airlines generally turn down the level of oxygen in the cabins during the flight. Most of us have noticed that people fall asleep in airplanes

soon after take-off, even if they have had a good night sleep and it is still early in the day. When most passengers are asleep or drowsy, there is a reduced need for cabin personnel.

Most of the cabin personnel get adjusted to periods of low levels of oxygen. One of the ways of doping in sports is to increase the number of red blood cells. The red blood cells carry the oxygen in the body. The more red blood cells available, the more oxygen he/she will have available for metabolism of in their muscles.

Forty years ago when I was competing in rowing, people said that the higher the breathing capacity, the better the sports performance. Our club champion was number two in the Olympic Games. He had the highest breathing capacity in the club.

At that time, some of the teams trained for a period at high altitude in the mountains. The air was thinner. The body had do adapt to low levels of atmospheric oxygen by producing more red blood cells. When they came back down from the mountain, they had a higher red blood count. Today, we hear about an illegal practice of blood doping. A doctor takes some of the blood from the athlete long before the competition, separates out the red blood cells, freezes them and stores them. Then just before the race, they put these blood cells back into the athlete – who now has higher levels of red blood cells and has more oxygen available.

If there is a reduction of red blood cells as occurs in anemia, people feel extremely tired and cannot think clearly. This is the condition for many children with autism, Asperger, ADH (DAMP), learning problems and behavioral problems.

Our bodies affect our emotions

One of the first American psychologists, William James, asked the question, "Do we run because we are afraid, or are we afraid because we run?" In other words, does our emotional state determine our behavior, or does our behavior determine our emotions.

Obviously, neither one nor the other is true. Both are true. We run because we are afraid and we are afraid because we run. However, in our culture, we generally believe that our thoughts come first, then our emotions, and then our behavior.

In our culture, we believe that there is a reasonable explanation for our emotions. Typically, we ask someone, "Why did you get angry?" "Why were you afraid?" We expect that there was a reason behind the reaction.

If we can convince the person that their reason for their emotion or for their behavior was wrong, or that there is a better way to solve the issue, then we believe that they will change their behavior. We believe that we can bring about change in our pattern of emotional reactions by talking with a psychologist, a coach or a counselor. This approach is widely accepted in our culture. If we can only get to an understanding of why we had an emotion and why we acted in certain ways, then we can change our reactions and our behavior in the future by changing our mind set. In some cases, this is true.

In contrast to this psychological model, the concept of neuroception as set forward by Stephen Porges implies that in a well functioning person, the reactions of fight, flight or withdrawal occur instinctively, immediately and before thought formation. For example we might be enjoying ourselves with family and friends and feel relaxed, open and loving. But if our organism suddenly senses that our environment is no longer safe – if someone threatening comes in the room, if there is a fire and we smell smoke, or if there is an explosion from a terrorist bomb, then we would respond immediately, instinctively and without having the time to think about.

In nature, when a danger suddenly presents itself, there is no time to think. On television, I have seen videos of herds of zebras crossing crocodile infested rivers in their migrations across the African plains. The crocodile swims quietly under water and sneaks up on the fringes of the unsuspecting herd. When the animal of prey is close enough to the unsuspecting animals, the crocodile suddenly opens its jaw and thrusts its body forward at one of the zebras. The zebra moves instantaneously away from the threat. If it is lucky, it avoids the jaws of the crocodile and gets across the river.

The zebra responds immediately by reflex. There is not time for the zebra to figure out what is causing the disturbance, recognize the splash in the water as a "crocodile", "think and decide" what to do, or consider which way to go. Without much time spent in mental activity, the zebra moves as far away in the opposite direction as fast as it can. If there is enough room, it might get away or it might be able to turn and kick with its hind legs. But if it bumps into another zebra, it is all over.

In human beings, our response can be just as fast as the zebra if we have a well functioning neuroception. But our thinking often gets in the way.

We sometimes test what we call "reflexes" in people taking a driving test. When a red light blinks, they are instructed to push a button. This takes nine tenths of a second from when the light blinks until they actually push the button. An Olympic sprinter can run 10 meters in 9/10 of a second. Compared with the immediate response of the gnu, this response to the red light is very slow. Neurologically, it involves recognition, decision and a pathway from the brain to the muscle to execute the movement.

If a zebra waited for nine tenths of a second from when the crocodile suddenly made a splash before it moved, the zebra would always be a good meal for a crocodile. But sometimes, a zebra gets away because it has a faster reflex than what we call a "reflex" at a driving test. The zebra has perfectly functioning neuroception.

Although as a species, human beings spend a lot of time thinking, we have the same built in instinctive mammalian nervous system for survival as the zebra. If we were really afraid, really angry or suddenly went limp and withdrew - and if that response was appropriate, when asked "why" we were angry, afraid or apathetic, we could simply say that our response was the result of our perfectly functioning neuroception. We responded instinctively to a sudden change in our environment as it changed from "safe" to "dangerous" or to "life threatening". This would not leave us with much to "understand" intellectually about the reasons for our behavior when talking with a psychologist.

In his article, Stephen Porges also discusses the concept of "faulty neuroception". In this case the response is not appropriate to the situation. Perhaps we did not notice a danger and continued to act as if we were in safety. Perhaps we were safe, but responded as if there was a danger or a life-threat. "Faulty neuroception" is an interesting concept.

One reason for faulty neuroception can be associations from past trauma. Our present experience reminds us of something that we experienced before. We respond not to present time, but to something that happened in the past. Another cause for faulty neurocep-

tion can be chronic dysfunctions of the nervous system, hormonal disorders, alcohol or drugs (legal or illegal). The person is affected by physiological states or chemical influences.

How can we change from faulty neuroception to appropriate responsiveness?

Some people go to a psychologist. Talking about past perceptions and behaviors to a psychologist works for some people to help them to make the changes they want in their life, but it does not work for everyone.

A psychiatrist will often prescribe drugs to bring about changes of states and try to modulate feelings, emotions and behavior from changes in the blood chemistry.

If talking to a psychologist, psychiatrist or a friend does not work, then some people try to change from undesirable emotions themselves by changing the state of their body chemically by taking drugs (legal or illegal) or drinking alcohol.

In other cultures, people have different beliefs about feelings and emotions. In India for thousands of years, people have released themselves from unwanted emotional states by doing breathing exercises, pranayama. In China, the emotions are related to the five elements which in turn can be treated by acupuncture, exercise, diet or traditional Chinese herbs.

In our hands-on applications of the Social Engagement Protocol, we use techniques from French cranio-sacral therapy in order to release physical tensions that have disturbed the proper function of five cranial nerves (V, VII, IX, X and XI).

In Stephen Porges' recent research project, which he called the Listening Project, he reported positive changes (cures) in the behavior of 80% of autistic children in five 45-mintue sessions delivered over five days. By using specially designed computer distorted music, he stimulated at least two cranial nerves (V and VII), which are part of the social engagement nervous system. By restoring the proper function of these nerves, he brings about normal behavior in the children.

One of the therapists that I trained in cranio-sacral therapy is a psychologist. She works with immigrants to Denmark, who had been victims of torture in their homelands in the Middle East and Africa. Rather than using the verbal techniques from her training as a psychologist, she used our form for cranio-sacral therapy with great success. She was able to move the torture victims out of locked-in states of anger, fear or depression and with hands-on techniques got them to feel safe in themselves.

She was part of a group of therapists with other forms of training. The group found that if she treated the torture victims first, non-verbally with our form of cranio-sacral therapy, they got better results than when the patients first talked with a therapist about what had happened to them. When she was able to lift a traumatized person up to a physiological state of social engagement, then when the person started to talk about the horrible things that had happened to them in the past, it was as if they had a better perspective, a healthy distance to the event and an inner strength. Their verbal recall did not re-stimulate the trauma so strongly and the client did not get locked more deeply into their trauma.

If the torture victims were not lifted up to a level of social engagement, but were in states of stress or helplessness, then talking to the psychologist only restimulated their trauma. They were not able to raise themselves out of stress, anxiety or withdrawal. They were not able to feel safe and to behave socially. The experience often left them in a worse state than before the start of the session.

If the environment is safe, special forms of hands-on therapy such as our Social Engagement Protocol can help patients to feel safe, restore flexibility to their nervous systems and move them up to a level of social engagement. When they feel safe, social activities such as talking (even about terrible things that happened to us) can help them to clear out memories of past trauma and to better be able to self-regulate their nervous system. We believe: Physiology first, then the psychology afterwards - - - if the psychology is at all necessary after you change the physiology.

To end this article, let us return to the case of the mother treating the dermatomes C3 and C4 on her son's neck to improve his breathing. Here it was a case of improving the physiology first. Helping Jakob to a relaxed pattern of breathing had an immediate, positive effect on his emotional state and normalized his behavior.

Susanne helped him to let go of the physical restriction that had blocked his breathing. After a few minutes of treatment with a light touch on the areas of the skin enervated by the 3rd and 4th cervical nerves, his breathing became normal. He got the levels of oxygen that he needed. He regained the flexibility in his nervous system. He was again able to respond appropriately to changes in his environment. He was no longer withdrawn - when he was together with others, he interacted socially and enjoyed communicating. His obsessive behavior of washing his hands two hundred times a day diminished drastically.

I have written this article for cranio-sacral therapists with our form of training in order to call their attention to "another place" that they might treat in order to increase their chance for success in their work not only with children with behavioral and communication problems, but with all of their clients.

We usually treat tensions at C3 and C4 as part of our protocol for categories I and II in the protocol which we teach in KST VII (S.O.T.). But we have not as yet included treating these areas in our teaching of the course in Social Engagement Protocol. It might be worth your while considering treatment of C3-4 as a possible addition to your Social Engagement Protocol treatments.

We also are teaching a short course, "Power KST: Asthma," for our recommended cranio-sacral therapists to help their clients to improve breathing.

If you can help anyone to a larger breathing capacity, they will enjoy a major improvement in the quality of their life.

If you do body therapy but are not familiar with our work, you might have success with some of your clients by helping them with their breathing by lightly stretching their skin at the level of the dermatomes of C3 and C4.

Post Script

1. Usually, when a child is dysfunctional, we diagnose only the child. One of my friends in the USA who successfully treats autism in the Philadelphia area is Donna Smith. Generally, she will not treat a child unless she also treats the parents.

When I treat children, I find that in many cases, their condition can be helped tremendously by releasing the structural restrictions in their body with our Social Engagement Protocol. However, when I look at some of the parents, I observe that they are also lacking flexibility in their nervous system. Sometimes one or both parents can be locked into a state of stress (fight/irritability or flight/ anxiety) or state of depression (helplessness, hopelessness or apathy). How is it possible for a child to feel safe when one or both of their parents are dysfunctional in the adaptability of their nervous system? The children pick up these signals instinctively.

2. In our health care system, the preponderance of diagnosis of children with problems generally describes their behavior: hyperactivity, learning disabilities, motor handicaps, selective autism (not responding in a normal emotional way in some "chosen" situations), infantile autism (not responding emotionally and being non-communicative), obsessive compulsive, Asperger (communicating verbally, but not being social and responding emotionally), etc. However these diagnoses do not assess their physiological state, their breathing or their flexibility/inflexibility of their autonomic nervous system.

For me, these diagnoses do not describe the physiological causes of the abnormal behavior. Therefore, so many unfortunate children do not get successful treatments.

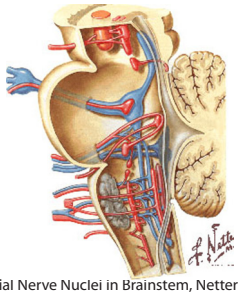
If you can change the physiology, you can change the behavior. Stephen changes the physiology by stimulating the function – he uses special computer distorted music to stimulate two muscles in the ear (tensor tympani and stapedius) which stimulates the nerves to these muscles (cranial nerves V and VII).

We work in a different way to create the positive changes in these same nerves. If you change the physical structure, you can change the physiological function. At critical places in the body, we are able to relieve the physical restrictions on the nerves of social engagement.

If you change the physiology and the neurology, you can change the emotional state. If you change the emotional state, you can change behavior. Then many of the diagnoses, names describing behavioral problems, are only descriptions of how the child had behaved in the past – now the child behaves normally.

The five nerves of social engagement:

All five nerves originate in the same structure, the brain stem. You can see a diagram of these five nerves in the drawing.



Cranial Nerve Nuclei in Brainstem, Netter

The eleventh cranial nerve also partially originates in the brainstem and partly in the first 3 cervical nerves

The fifth and seventh nerves relate to the front of the face, the muscles of the jaw and two important muscles in the middle ear.

The fifth cranial nerve (C.N. V) is called the trigeminal nerve and enervates the muscles of mastication. Chewing is necessary for eating and eating together with other people is an important part of our social life. This nerve also gives us sensory feedback from the skin of the face.

Perhaps knowing what we are feeling comes from sensing the changes of the shape of the skin of the face from patterns of tension in the underlying muscles of facial expression.

Loving gestures or intimate caresses often include a light stroking of the face of one's partner or child.

The seventh cranial nerve, facialis, (C. N. VII) has several functions, one of which is to enervate the muscles of facial expression. This allows us to express our emotions so that other people understand us. When we feel safe, we can let ourselves be open emotionally. When we do not feel safe, we freeze our facial expression so that others cannot read us and we do not know ourselves what we are feeling.

The muscles of facial expression allow us to open and close the openings to our sensory organs – to open and to close the muscles and skin around the eyes, to dilate or constrict our nostrils, or to open/close or to change the shape of our mouth.

We can open our eyes to let in more light, close them partially to let in less light or close them entirely to let in no light. We can see other people and our surroundings more clearly by opening our eyes. We withdraw partially by seeing less or withdraw even more by seeing nothing at all. We enhance or diminish the flow of air through our nose affecting not only our breathing but also increasing or decreasing our ability to smell. We open our mouth or close it tightly to allow us to take in air to breath or food to taste. If the food or water tastes good, we can swallow it.

Neurobiologists studying the nature of the expression of feelings and emotions say that the first observable event in time is a change in the tension in the facial muscles. For example, the eyes might narrow and the teeth might clench slightly. The next event is the formation of a thought. For example, I think "he is dumb" because of what he is saying. This is followed by our awareness of our emotion: For example, he irritates me or he makes me angry.

Usually, we are unaware of the initial change in facial expression. Generally, the first event that we notice is our own thought. We incorrectly believe that this thought is the cause of our emotions. However, in the flow of time, the emotional change embodied in the change of facial muscles had already started before the thought ever came into our mind. We first notice the thought, but we did not notice the change of facial expression consciously.

Psychologist Paul Eckman studied the role of the face in emotional expression. He wrote believe that the sensory nerves in the facial muscles report back to our own brain the shape of our face and in that way we know what we feel.

Sometimes a woman will ask her husband, "Why are you angry?" She can see it on his face, notice the way he is holding his breathing and sense the changes in his tightening the musculature of his body. He might answer (somewhat angrily), "I am not angry." He is still turning the thought in his mind that the other guy is stupid. He has not yet caught onto the fact that he is angry. Being angry, he might get irritated at her for saying that he is angry. First, later will he experience

the thought that the other guy is stupid as the justifiable cause of his anger.

Similarly, a man might look at his wife and ask her why she is sad. She might answer that she was thinking of her aunt who is sick. Then as she expresses the thought verbally, tears will come and she will go more fully into the feeling of sadness. The next thing she might do is to try to hold back the tears. If he says, I understand that you feel sad about that, the flow of tears can flow freely. It is as if she has to feel safe to allow herself to express her emotions.

If you watch another person's face, you will often know what they are feeling before they are aware of it themselves. But many people much of the time do not look at the other person, so they are surprised that the other person's emotional reaction.

If the other person has proper function of their facial nerve, C. N. VII, and if they are uninhibited in allowing the muscles of their face to express their feelings, when we look at them especially if we make eye contact, our own facial muscles will resonate with micro-movements that mirror changes in their facial muscles underlying the flow of their emotions. We can feel what they feel by the changes in muscular tension induced in our own facial muscles. In the same way, when they look at us, their face will mirror our movements and they will be able to get a sense of what we are feeling. These movements occur at least 20 times a second – far too fast for us to register it consciously.

To summarize, we not only visually register the pattern of expression of emotions and feelings by seeing the expressive movements in another person's face, but by our automatic, subconscious mirroring of their movement, we can also register their expression kinesthetically. Proper function of the facial nerve and the muscles of the face by both parties is an essential aspect of non-verbal communication of feelings and emotions. We know what they feel and they know what we are feeling. This is a prerequisite for empathy, understanding, social bonding, friendship, love and intimacy.

Autistic people do not make eye contact. Children with diagnoses of autism and Asperger do not express their emotions facially. The same is true for people in stress states (in states of fight/flight or in other terms irritated or anxious). The same lack of facial expression is a characteristic of people in depression (hopelessness, helplessness and apathy), or people with pain or for people with physical illness.

Taken together, the fifth and seventh cranial are responsible for our facial expression, not only in the motor nerve function to direct the activity of the muscles, but also in the sensory nerve function to give us feedback with regard to what is happening.

The fifth and seventh cranial nerves have another function that is important to hearing. The 5th cranial nerve controls the level of tension in the eardrum, tensor tympany. If the drumhead is too tight, we have an oversensitivity to sound. If it is too low, we can have a lack of adequate transmission of sound.

The seventh cranial nerve enervates the stapedius muscle. This is the smallest muscle in the boy. It attaches to the staples, one of the three small bones in the middle ear. Because of their shapes, these three bones are popularly called the hammer, anvil and stirrup. These bones are held together by tiny ligaments in a kind of a chain. When the stapedius tightens, it pulls on the entire chain. This tuning makes it easier for us to hear sounds of certain frequency.

For us to hear and to understand human voice, it is necessary for this stapedius muscle to filter out sounds of frequencies that are lower than or higher than the range of the human voice.

Can problems of communication and learning of language possibly be caused by dysfunction of the stapedius muscle? If high and low frequencies are not filtered out, then they overwhelm the sounds that fall within the range of the human voice making it impossible to decipher what is being said.

Many of us have traveled to another country where people speak a language that we do not understand. We find it uncomfortable when they do not talk to us in our own language. But at least we know that we are in a foreign language zone and we look forward to coming "home" to where we understand others and they understand us.

But try to imagine that you are born into a family and a society and you cannot understand what is being said. People around you might get frustrated with your inability to understand and to communicate. You might be the object of their anger or punishment because your behavior is not what they expect. You might develop some rather bizarre behaviors, none of which include normal communication.

Unfortunately, the usual hearing tests do not measure the effectiveness of the function of the stapedius muscle. Therefore, when you ask parents of autistic children if they can hear, you they might answer, "There is nothing wrong with their hearing. The doctor checked it."

Typical observable signs of autism are a lack of facial expression, a lack of prosody, and difficulty in verbal communication. Could this be dysfunction of cranial nerves V and VII?

The ninth, tenth and eleventh muscles all exit the skull through the same opening, the jugular foramen. If there is dysfunction in any one of these three nerves, there is usually dysfunction in all three.

Together, the ninth and tenth cranial nerves facilitate the muscles of the throat which are vital to swallowing, breathing, and vocalizing. (The tenth cranial nerve is called the vagus.)

Prosody (melodic modulation of the voice) is an important quality in human communication. Autistic people usually lack prosody. Their voice is flat and monotoned, making them hard to understand.

In addition to regulating the muscles of the throat, in mammals, one of the three branches of the vagal nerve (the ventral vagal) helps to regulate the breathing by relaxing the muscles of the bronchia and the lungs. Dysfunction of the autonomic nervous system can be seen as a contributing factor to illnesses such as asthma. Other factors are the C4, the phrenic nerve which goes from C3, C4 and C5 to the respiratory diaphragm.

The ventral branch of the vagal nerve also acts as a "brake", slowing the heart rate. If the ventral nerve is damaged in human beings, the heart beats at 120 times per minute. Dysfunction of the vagal brake can manifest itself in a fast pulse, irregular heart beat or high blood pressure.

Two other branches of the vagal nerve, the dorsal vagal, also facilitates the organs of digestion (esophagus, stomach, liver, duodenum, small intestine and parts of the large intestine.) Dysfunction of the

tenth cranial nerve can manifest in acid reflux, ulcers, loose bowel movements, diarrhea as well as other digestive disorders.

One branch of our nervous system is called the autonomic nervous system. It is composed of two branches, the sympathetic and the parasympathetic.

Traditionally, we believed that when the sympathetic nervous system is active when we respond to a dangerous situation with fight or flight behaviors, there is less parasympathetic activity.

Traditionally, the parasympathetic branch has been associated with the vagal nerve and relaxation. When there is sympathetic activity, then we believed that there is less parasympathetic activity.

Stephen Porges in his Polyvagal Theory calls attention to three branches of the vagal nerve in mammals – two of the dorsal vagal and one ventral vagal. Both the ventral vagal and the dorsal vagal give rise to states of relaxation, but these two states are very different.

To have social engagement requires ventral vagal dominance.

Excessive stimulation of the two branches of the dorsal vagal causes withdrawal, a shutdown of activity and attention.

Autistic children usually display problems of communication from lack of function of the stapedius muscle along with emotional states of fight or flight or states of passive shutdown,

The eleventh cranial nerve, accessory nerve, C.N. XI directs the tensing and relaxing of two muscles which help to turn the head (the trapezius and the sternocleidomastoid muscle). Dysfunction of this nerve not only results in tension in these muscles, which in turn can be a factor in migraine headaches, tension headaches, dizziness, shoulder pain and poor posture.

Susanne's success in treating Jakob by stroking the back of his neck.

Sometimes, we are surprised by a successful treatment. If we listen to positive results in treating difficult cases, we might not only get a new understanding for the problem, but also get a new protocol for successful treatment.