Foundations for Clinical Neuroplasticity: A Model for Initial Clinical Protocols That Facilitate Optimal Neural Function

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Abstract

Objective: To establish an evidence based, clinical model for creating faster overall goal achievement through neural growth using recognizable, predictable and gradable assessments and therapeutic activities.

Methods: All neurological output has a muscular contraction component, thus identifiable muscle response patterns. The study used clinical assessments focused on muscular patterns associated with 5 factors: (1) The connectivity of sensory input and specific motor output patterns per Carla Hannaford; (2) Stress patterns linked to dominance profiles; (3) The extent of trauma and defense posturing; (4) The presence of healthy nutritional profile; (5) Neural Maturity—including the dominance of intrauterine and primitive reflex patterns both in static and mobile posture, the presence of postural reflexes, the development of the neural nets throughout the brain and the expression of our 3 midlines. The study assessed 10 patients, birth to 75 years of age, experiencing difficulties in milestone achievement, emotional control, speech, auditory processing, ease of task completion and difficulty with academic work using these 5 factors. Baseline performances for each of the factors was established and then outcomes were measured against this initial control.

Intervention: The intervention used each factor’s specific protocols to create the neurological/cognitive change desired. Each factor can influence any of the other factors at any given time. This led to an intervention plan that seemed unconventional. However, the process was fluid as the protocols are simple and flexible. Ongoing clinical assessment of muscular patterns directed the flow of the treatment.

Results: We found that all 5 components needed to be addressed for optimal neuroplastic change, speeding up clinical progress and goal achievement. Each client treated experienced change, the degree of which was related to the amount of mitigation of the first 4 factors, compliance with a home program and the competence of the clinician. Not all patients wanted optimal functioning at discharge. The biggest change was in the average number of sessions needed to achieve therapy goals.

Conclusions: The study shows that it is possible to identify exactly what movement needs to take place to facilitate a specific neuroplastic cascade and then to connect that to other pathways, shortening overall treatment time.

3 to 4 years ago. This had us curious as to how to measure this gut feeling, and could we make the process even better. I spent much time talking with my colleague Judith Norman, a licensed professional councilor (LPC), Synergetic Play Therapist (SPT), an SPT instructor and School counselor. We concluded that measuring this would mean having a way to:

1. Measure and evaluate initial functional status—preferably producing a number
2. Document goals, both initial and achieved, related to that status – preferably a number
3. Predict how long (ie number of treatment sessions) was needed to achieve those goals without the new interventions
The measurable neuroplastic components have evolved throughout the brain, and the expression of our 3 midlines.

These have been collated into a Neural Maturity Score (NMS). The highest possible score is 118, and would indicate profound impairment of neurological and human function. Using this scoring system, it is possible to determine what NMS number a functional goal for a client will be, as well as measure how much progress they have made. The initial assumption of the score (based on clinical experience) was that neurological maturity influences general functional goal attainment – no matter the actual goal. This is because all function has a movement component. All movement can be affected by neurological maturing process, and has associated behaviors and skills. And, because neurological processes are also affected by intentional movement, we have a way of intervening.

I have defined Neural Maturity as having access to multiple responses to a given stimulus that neither injure self/others, nor does their generation take excessive effort, or lead to exhaustion. Extent of Neural Maturity is reflected by the score approaching 0 on the NMS. Most clients will not score close to zero, as there is often the effect of one or more negating factors that stays in play – for example; reactions to Glyphosate exposure, over the long term. Mixed Dominance will also result in a score higher than zero.

Interventions that we use follow the same path as the NMS and create a clinical neuroplastic cascade. This term refers to the incidental changes that happen when neural connections are made that are functional and appropriate and facilitate the next step in maturation. The process includes establishing correct connectivity; mitigating the stress profile and creating whole brain function; allowing the trauma processing to complete and take its appropriate place in history; correcting as much of the nutritional status as possible; and then ensuring neural growth has followed optimal human development and not become entangled or thwarted by structural damage or any other problem. The cascade effect happens when the pieces come together and the whole effect is greater than the individual parts.

To facilitate this intervention, we treat in the clinic with skilled hands-on bodywork techniques, some developed by myself and taught in the Foundations for Clinical Neuroplasticity Class, as well as Synergetic Play Therapy, EMDR and any other intervention that will progress any one or more of the 5 components. We also send home movements and activities that further the cascade if completed. These home exercise programs (HEP) can include listening programs, movements, social participation, stress management and whatever engagement will facilitate progress in any of the components. This treatment process has evolved into the Haller Method, as it is specific in its application and thought process, but not in modality.

4. Determine the rate at which improvement was made in relation to these goals
5. Measure which of the treatment components influenced the progress rate and functional status
6. Find out if other therapists could reproduce this process too

Over the past 3 to 4 years we implemented changes to treatment based on our ongoing and increasing knowledge base related to how the brain grows and works. This is not static – so a model that incorporated this dynamic process was born. The 5 components of Neuroplastic change became the foundation for how to think about the factors that influence clinical resolution of the presenting issues for clients. These 5 components are based on the following premises:

1. The physical brain has the purpose of controlling and directing movement
2. If you cannot find a muscle sensorially, you cannot move it
3. Neuroplasticity exists and follows the principle of what fires together wires together and that which is ignored is pruned
4. Deliberate movement and posture has an influence on neurological firing just as neurological firing causes movement
5. Muscle tone can be reset, and balance of firing influenced through proprioceptive neuromuscular techniques
6. The first neurological pathways established in utero, are reflexive in nature; involving muscular contraction and are predictable and obligatory in their initial appearance
7. Patients should be evaluated developmentally and treated sequentially
8. All 3 midlines need to be established for development to progress optimally
9. Lateralization and hemispheric dominance is a factor of 3D existence and influences all functions
10. Activated Defense mechanisms will override all developmental progress and shut down choice if unmitigated

The measurable neuroplastic components have evolved and consolidated into:

1. The connectivity of sensory input and specific motor output patterns;
2. Stress patterns linked to dominance profiles;
3. The extent of trauma and defense posturing;
4. The presence of a healthy nutritional profile;
5. Neural Maturity—including: the dominance of intrauterine and primitive reflex patterns both in static and mobile posture, the presence of postural reflexes, the development of the neural nets through the brain, and the expression of our 3 midlines.
Results

A word about the data: it is presented without much adjustment. I have not produced standard deviations and more sophisticated statistical analysis. It is meant to be clinically useful and something that can be easily understood and applied by clinicians.

I took the Plan Of Care (POC) write up and the frequency projection for 10 arbitrary clients from my last two years caseload, as it was originally written up for the number of days we could have therapy and work toward client centered goals. Then I wrote POC including evaluations, goals and treatment plans and frequency of intervention in terms of a NMS and NMS goal. So that those clinicians who question what I initially projected for a POC can be answered, I have set out the raw data here. There are factors that I considered that influence outcome and play a part in progress, specifically: Diagnoses that–at this time–have no cure; Age; length of time problem has been there; environment; new trauma. As these factors are a reality of therapy that I cannot compensate for, I left them be - knowing they would influence the outcome, but just to see if there was difference even with them present anyway.

I expected a specific rate of progress when I started treating and this was reflected in my POC. Our gut feeling, initially, was that patients were progressing much faster than we were used to. This whole retroactive study was started to see if this was really happening.
It was. Patients have been improving faster than we were originally predicting based on our old methods.

In light of this, I wondered if it would be possible to find factors that we can use to be more accurate in our current POC set up, taking into account our new methods of intervention. Taking the NMS average rate of progress for these 10 clients (6.419 points per session), and multiplying it by the number of score points we wish to influence in an intervention period or series of treatments, the prediction number was more accurate for the actual treatment time needed for some clients but not for others. I thought it should all have come out similar—at least within 2 to 3 sessions, but it did not. This was confusing until I added the effects of the HEP compliance.

To further hone the process, I wondered if there was a correlation between which of the five components were mastered, and rate of overall progress. I wanted to better understand the factors that influence the neuroplastic cascade. I plotted the rate of mastery of connection, stress management, trauma mitigation, nutrition improvement and neuromuscular development.

If I add HEP compliance to the picture it makes even more sense.
If there are difficulties in establishing connectivity, stress mitigation, trauma mitigation or nutritional access or the HEP, neural maturity does not progress and goal attainment is slowed.

**Discussion**

In order for one to accept that effecting neural maturity change will have a cascade effect on all human function, running into goals and functions never even dreamed of, or mentioned in the therapeutic environment, one has to accept the premises listed above in background. Neural maturity, defined as having multiple choices of response to any given stimuli, will result in any number of expressions which cannot be quantified.

The almost unbelievable decrease in time taken to achieve the goals of my 10 clients is a phenomenon commented on by the clients and their caregivers during therapy. This is not just a study idiosyncrasy. This is really happening. I teach a class on Foundations for Clinical Neuroplasticity. It is the most prevalent comment from my students. Their treatment times are a lot shorter, some saying goals done in 6 weeks, other 8 weeks. These are therapists who would routinely set up POC’s for 26 weeks with possible POC renewal at the end of the first 26 weeks. Much like my initial POC projections.

It is beyond the scope of this study to explain exactly what it is we do, how we know what the next component is, and how to facilitate that neural path. But we are able to say that when we implement this body of knowledge known as the Haller Method, it changes lives and shortens treatment time.

I started this study to understand and document what I was seeing in the practice w.r.t. rate of improvement using. It has proved that it is the combination of the modalities that brings about the change.

I noticed that in each of the patients that did not progress in with the first 4 components, the neuromuscular maturity did also not develop either. In going through treatment notes, those that did not show progress in the first four components are clients for whom we did not...
emphasize the HEP enough, nor did we start in what we now consider to be a standard order of treatment. There were components we left for later—like the dominance evaluation and the head control component. We seemed to change steps in our approach that showed up as slower progress especially if measured by the new expected rate of progress.

**Conclusions**

This study provided evidence that the method of intervention we are using is an effective clinical model for creating faster overall goal achievement through neural growth using recognizable, predictable, and gradable assessments and therapeutic activities.

The study shows that when the exact next movement is identified and facilitated, thru addressing the 5 neuroplastic factors (connectivity, stress mitigation, trauma processing, nutrition and reflex integration) in developmental order, and the specific neuroplastic cascade needed for (client) goal achievement is connected, progress rates increase and number of treatment sessions decrease by up to 80%.

If compliance with a HEP can be obtained, progress is even faster. Since the Haller Method of Influencing Neuroplasticity’s HEP contains components of connectivity and stress mitigation, the overall result of encouraging compliance is beneficial to all. And for those paying out of pocket for services - is financially a good idea.

It is possible to have a way to predict treatment courses that are more accurate, realistic and client driven than insurance and payor source limitations allow.

The NMS score is not a substitute for functional goals—just an identifier of roadblocks to those goals. Understanding the components of the client’s goals and how they dovetail with Neural Maturity, choice and the other components of neural function is still crucial for the therapeutic process. In the end one still has to contract muscles to achieve a goal. Understanding how neural maturity affects that ultimate muscle contraction needed for the goal accomplishment, is the therapeutic piece. NMS tells you where to start and how to progress.

A study with a larger number of clinicians using the NMS and the Haller Method would provide a better co-efficient and POC session number predictor. It may be worth standardizing the NMS. A record of incidental changes achieved while addressing Neural Maturity would provide impetus for broader application of the method.

From cursory enquiries, and various mentoring relationships, the report back is that it is possible for other clinicians to replicate these results, given the knowledge of how to implement the Haller Method.

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**References**