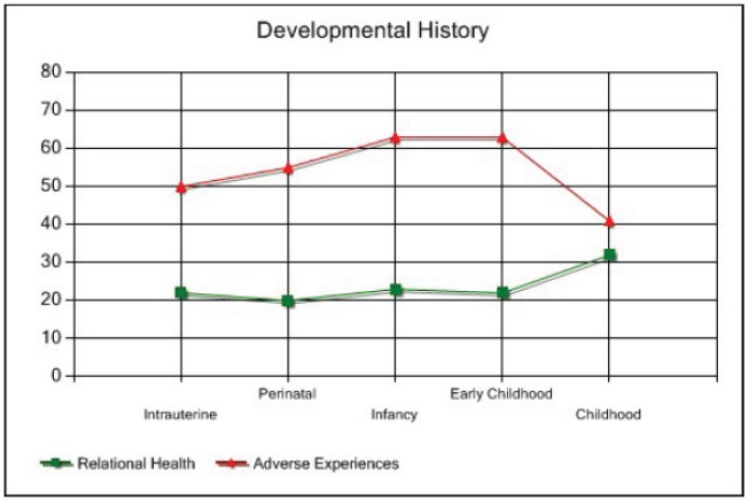
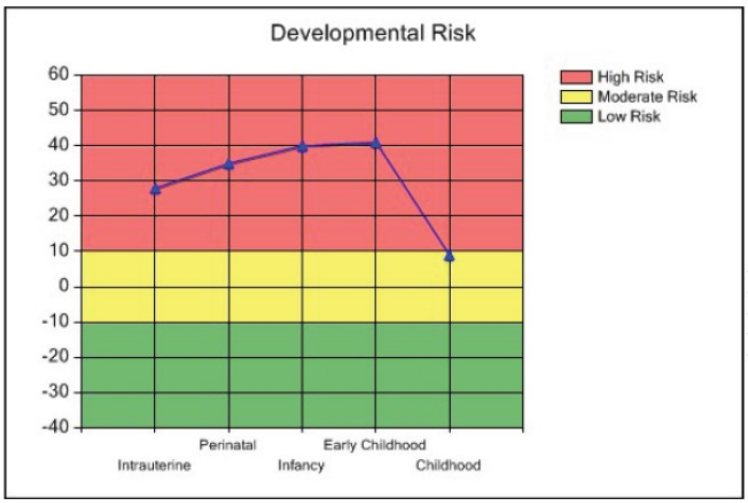
The Neurosequential Model of Therapeutics as Evidence-based Practice

The Neurosequential Model of Therapeutics (NMT) is a developmentally sensitive, neurobiology-informed approach to clinical problem solving. NMT is not a specific therapeutic technique or intervention. It is an approach that integrates core principles of neurodevelopment and traumatology to inform work with children, families and the communities in which they live. The Neurosequential Approach has three key components – training/capacity building, assessment and then, the specific recommendations for the selection and sequencing of therapeutic, educational and enrichment activities that match the needs and strengths of the individual.

As described by Brandt and colleagues (2012) – *"The Neurosequential Model of Therapeutics (NMT) (Perry, 2006) provides an integrated understanding of the sequencing of neurodevelopment embedded in the experiences of the child, and supports biologically informed practices, programs, and policies. As a global evidence-based practice (EBP) and coupled with the NMT's brain mapping matrix, the model supports providers in identifying specific areas for therapeutic work and in selecting appropriate therapies, including evidence-based therapies (EBTs), within a comprehensive therapeutic plan. Organized NMT-based intervention models, such as NMT therapeutic child care, can be EBTs."*

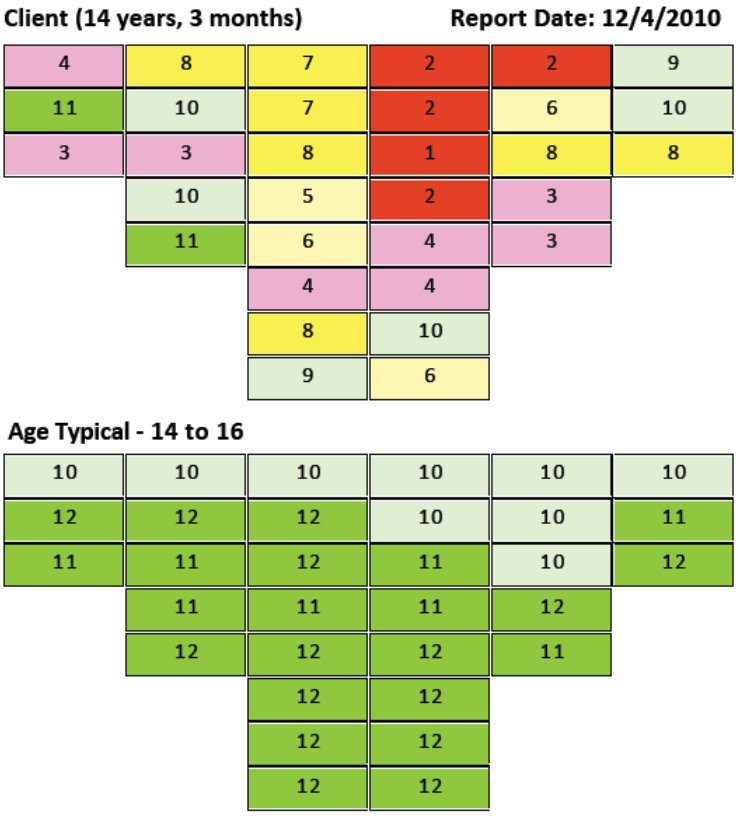




A more detailed overview of the NMT will help articulate why NMT is an EBP. The NMT assessment process examines both past and current experience and functioning. A review of the history of adverse experiences and relational health factors helps create an estimate of the timing and severity of developmental risk that may have influenced brain development (see graph). In the sample graph, both the timing and severity of risk and resilience factors are plotted (top graph) to generate an overall developmental risk estimate (bottom graph). In this case this individual was at high risk for developmental disruptions – with potential significant functional consequences – during the entire first five years of life.

A review of current functioning identifies problems and strengths in current functioning and helps generate a visual representation of the child's estimated current

functioning organized into a neurobiological fashion; this generates a Functional Brain Map (see below). The NMT "mapping" process helps identify various areas in the brain that appear to have functional or developmental problems; in turn, this helps guide the selection and sequencing of developmentally sensitive interventions. These interventions are designed to replicate the normal sequence of development beginning with the lowest, most abnormally functioning parts of the brain (e.g., brainstem) and moving sequentially up the brain as improvement is seen. The NMT is grounded in an awareness of the sequential development of the brain; cortical organization and functioning depend upon previous healthy organization and functioning of lower neural networks originating in the brainstem and diencephalon. Therefore, a dysregulated individual (child, youth or adult) will have a difficult time benefiting from educational, caregiving and therapeutic efforts targeted at, or requiring, "higher" cortical networks. This sequential approach is respectful of the normal developmental sequence of both brain development and functional development. Healthy development depends upon a sequential mastery of functions; and a dysregulated individual will be inefficient in mastering any task that requires relational abilities (limbic) and will have a difficult time engaging in more verbal/insight oriented (cortical) therapeutic and educational efforts.



The NMT Web-based Clinical Practice Tools (aka, NMT Metrics) help provide a structured assessment of developmental history of adverse experiences, relational health and current brain- mediated functioning. These NMT Metrics are designed to complement, not replace, existing assessment tools (e.g., CANS, CAFAS) and psychometrics (e.g., CBCL, IES, WISC, WRAT). They are designed to allow use across multiple systems using multiple assessment packages. The primary goal of the NMT Metrics and assessment is to ensure that the clinical team is organizing the client and family's data (and planning) in a developmentally sensitive and neurobiology-informed manner.

Above is an example of a functional brain "map" produced by the web-based NMT Clinical Practice Application. The top image (with the red squares) corresponds to a client (each box corresponds to brain functions mediated by a region/system in the brain. The map is color coded with red indicating significant problems; yellow indicates moderate compromise and green, fully organized and functionally capable). The bottom map is a comparative map for a "typical" same-aged child. The graphic representations allow a clinician, teacher, or parent to quickly visualize important aspects of a child's history and current status. The information is key in designing developmentally appropriate educational, enrichment and therapeutic experiences to help the child.

This clinical approach helps professionals determine the strengths and vulnerabilities of the child and create an individualized intervention, enrichment and educational plan matched to his/her unique needs. The goal is to find a set of therapeutic activities that meet the child's current needs in various domains of functioning (i.e., social, emotional, cognitive and physical). An individual demonstrating significant problems in brainstem and diencephalic functions may end up with recommended activities that are primarily rhythmic, repetitive and somatosensory in nature such as music, dance, yoga, drumming, various sports, therapeutic massage or more traditional play therapy, sand tray or other art therapies. Later in the treatment process, with improved somatosensory processing and self-regulation, the treatment recommendations would shift to more relational and cognitive-behavioral focused interventions including a range of EBTs such as PCIT or TF-CBT.

NMT Training and Certification

The NMT training and capacity building component (NMT Certification) is a manualized yet flexible process that involves a minimum of 90 hours. Certification incorporates didactic teaching with web-based sessions using clinical cases presented by participating clinicians. It also incorporates multimedia and reading materials that focus on child development, neurobiology, traumatology, attachment theory and a host of related areas relevant to understanding the impact of maltreatment and other developmental insults on the developing child. The CTA has developed an NMT training certification process for individual clinicians and organizations. This training process provides the necessary exposure to the core concepts, practical application and use of the web-based NMT Metrics to establish and maintain fidelity required for examining clinical outcomes and conducting research using the NMT Metrics as part of the evaluation package. Certified clinicians from across the world demonstrate high fidelity and inter-rater reliability when "evaluating" and scoring the same client data.

The NMT is widely applicable to a variety of clinical and educational environments and has been integrated into a variety of settings across the full life cycle – infants through adults - including therapeutic preschools, early head start programs, infant mental health, ECI programs, residential treatment centers, schools and in numerous private and outpatient clinical practices working with young children, youth and adults. Several large public child protective services and child mental health settings have become certified and routinely use the NMT to help guide clinical decision-making.

Evidence-based Practice and the NMT

Over the past decade there has been a movement toward practice accountability from federal, state and foundation funding sources demanding proof of the effectiveness for specific interventions (Austin & Roberts, 2002). This increased interest in accountability has led toward more "evidence- based" work throughout various disciplines. Similarly, evidence-based medicine (EBM) refers to aspects of medical care in which the scientific method is applied to certain parts of medical practice. It seeks to assess the quality of evidence relevant to the risks and benefits of treatments (including lack of treatment). Evidence-based medicine is the conscientious, explicit and judicious use of current best evidence in making decisions about the care of individual patients (Sackett, 1996). The NMT adheres to these principles and as this relatively "young" approach to clinical work is disseminated, an impressive body of evidence is accumulating (see references below); some of this has been published, and much of it is in the process of being prepared for publication.

There are various levels of "evidence" which are to be considered when making the designation of "evidence-based." For example, the U.S. Preventive Services Task Force uses the following to ranking evidence about the effectiveness of treatments:

Level I: Evidence obtained from at least one properly designed randomized controlled trial.
Level II-1: Evidence obtained from well-designed controlled trials without randomization.
Level II-2: Evidence obtained from well-designed cohort or case-control analytic studies, preferably from more than one center or research group.
Level II-3: Evidence obtained from multiple time series with or without the intervention. Dramatic results in uncontrolled trials might also be regarded as this type of evidence.
Level III: Opinions of respected authorities, based on clinical experience, descriptive studies, or reports of expert committees.

The Neurosequential Model of Therapeutics currently meets criteria for Level III, Level II-3, Level II-2 and Level II-1. Randomized controlled trials in several settings are underway.

The NMT has the following EBP elements:

1.) Multiple sites participating in NMT Training Certification gather data that is used to determine efficacy of the model. The NMT model in these sites is employed in therapeutic preschools, residential treatment facilities, out-patient clinical settings, and large state child welfare systems. There are several cross-validation projects underway to compare NMT Metrics with a variety of other common metrics (e.g., CAFAS, CBCL, TSC).
2.) There are several reports from independent groups using the NMT that have demonstrated positive outcomes.
3.) All NMT-certified sites have demonstrated improved outcomes (using both NMT and non-NMT metrics such as incident reports, restraints, changes in CAFAS). In cases where the data were collected in systematic fashion these outcomes are statistically significant when compared to previous "treatment as usual" at the same site or organization.
4.) NMT metrics have been shown to be valid (both face valid and cross-validity have been examined) and reliable. There is a network wide inter-rater reliability process and ongoing "ratings meeting" to allow ongoing correction and supervision.
5.) The Certification and training process are manualized with a robust fidelity model (including inter-rater reliability and case-auditing process).

In 2015 the Federally funded National Quality Improvement Center for Adoption/Guardianship Support and Preservation (QIC-AG: http://qic-ag.org) rated the NMT as LEVEL 3 Emerging Practice (see below). When a number of current "in preparation" and "in press" reports are published, the NMT will meet their criterion for LEVEL 2 *Supported by Research* Practice.

QIC- AG Level of Evidence

The interventions and programs were identified from multiple sources that use various scales and levels for rating the evidence. Given the variations among the existing scales, the QIC-AG developed a six-level Evidence Rating Scale or "crosswalk" that enabled the project to approximate the level of evidence for each intervention by using one or more of the following three methods: 1) a review conducted by one or more credible evidence-based review organizations, 2) information provided by the developer or purveyor of the intervention, or 3) additional information about the intervention that was obtained from searches conducted by QIC-AG staff.

The QIC-AG developed and adapted the following Evidence Scale to ensure consistency and utility for the QIC-AG.

- *LEVEL 6 : Failed to Prove Positive Effect. Interventions in this level have been tested in studies but have not established positive findings.*
- *LEVEL 5 : Better Practice. Interventions in this level constitute guidelines or practices primarily driven by clinical wisdom, guild organizations, or other consensus approaches that do not include systematic research evidence.*
- *LEVEL 4 : Promising Practice. Interventions in this level are recognized by professionals and organizations in the field to have demonstrated an impact. This level of includes promising practices and acceptable treatments that have some research evidence or a record of clinical experience from experts or other respected authorities. Rigor of evaluation is low. Interventions appear to produce desired results and have shown promise in improving client outcomes in studies using non-experimental design.*
- *LEVEL 3 : Emerging Practice. Interventions in this level are supported and acceptable treatments with positive evidence from studies at the middle levels of the research hierarchy pyramid, including non-randomized studies, which are also referred to as quasi-experimental studies; observational studies; correlation studies; and comparative studies. Examples include panel studies, cohort studies, and case-control studies.*
- *LEVEL 2 : Supported by Research. Interventions in this level are supported with positive evidence from two or more quasi-experimental studies or at least one randomized controlled trial. Evidence at this level indicates a strong likelihood that intervention produces the desired effects, but the evidence has not risen to the level of proving cause-and-effect.*
- *LEVEL 1 : Effective and Proven by Research. Interventions in this level are well-supported with positive evidence from two or more randomized controlled trials (RCTs). RCTs are the "gold standard" in research, indicating a high level of evaluation rigor. However, given the high cost of conducting RCTs, fewer interventions have been evaluated using this design.*

Austin, D. M. & Roberts, A. R. (2002). Clinical social work research in the 21st century: Future, present, and past. In A. R. Roberts & G. J. Greene (Eds.), Social workers' desk reference (pp. 822-828). New York: Oxford University Press.

Sackett, D.L. et al. (1996) Evidence based medicine: what it is and what it isn't. BMJ 312 (7023).

Summary of Selected Reports and Publications related to NMT as "EBP"

Rationale for a neurodevelopmental approach to maltreated children

Perry, B.D. (1994) Neurobiological sequelae of childhood trauma: Post traumatic stress disorders in children. In Catecholamine Function in Post Traumatic Stress Disorder: Emerging Concepts (M Murburg, Ed.) pp. 253-276 American Psychiatric Press, Washington, DC

Perry, B.D., Pollard, R., Blakely, T., Baker, W., & Vigilante, D. (1995) Childhood trauma, the neurobiology of adaptation and 'use-dependent' development of the brain: How "states" become "traits'". Infant Mental Health J, 16 (4): 271-291

Glaser, D. (2000) Child abuse and neglect and the brain: a review J. Child Psychol. Psychiat. 41:1, 97-116

Perry, B.D. (2001) The neuroarcheology of childhood maltreatment: the neurodevelopmental costs of adverse childhood events. In: The Cost of Maltreatment: Who Pays? We All Do. (K. Franey, R. Geffner & R. Falconer, Eds.), pp. 15-37 Family Violence and Sexual Assault Institute, San Diego

Read, J., Perry, B.D., Moskowitz, A. & Connolly, J. (2001) The contribution of early traumatic events to schizophrenia in some patients: a traumagenic neurodevelopmental model. Psychiatry 64 (4) 319-345

Perry, B.D. (2002) Childhood experience and the expression of genetic potential: what childhood neglect tells us about nature and nurture. Brain and Mind 3: 79-100

Anda, R.F., Felitti, R.F., Walker, J., Whitfield, C., Bremner, D.J., Perry, B.D., Dube, S.R., Giles, W.G. (2006) The enduring effects of childhood abuse and related experiences: a convergence of evidence from neurobiology and epidemiology, European Archives of Psychiatric and Clinical Neuroscience, 256 (3) 174 - 186

Perry, B.D. & Szalavitz, M. (2007) The Boy Who Was Raised As A Dog: And Other Stories from a Child Psychiatrist's Notebook; What Traumatized Children Can Teach Us About Life, Loss and Healing. Basic Books, New York

Perry, B.D. (2008) Child maltreatment: the role of abuse and neglect in developmental psychopathology. In Textbook of Child and Adolescent Psychopathology In (Theodore P. Beauchaine & Stephen P. Hinshaw, Eds) pp. 93-128, Wiley, New York

Gibson, J. (2012) Keeping the child in mind: Learning about childhood trauma from personal experience and neuroscience. Refocus: The Residential Child Care Project Newsletter 18: 1-8

Twardowz, S. & Lutzker, J.R. (2012) Child maltreatment and the developing brain: a review of neuroscience perspectives. Aggression and Violent Behavior 15: 59-68.

Burnell, A. & Vaughn, J. (2012) Family Future's Neuro-sequential approach to the assessment and treatment of traumatised children: Neuro-physiological psychotherapy (NPP) in UNA CASA PER UN PO'- Esperienze di casa-famiglia, a cura di Wanda Grosso. Quaderni di Psicoterapia Infantile, Borla, Roma 2012

Ungar, M & Perry, B.D. (2012) Violence, trauma and resilience. In (R. Alaggia & C. Vine, Eds) Cruel but Not Unusual: Violence in Canadian Families pp. 195-235, WLU Press, Waterloo, CA

Read, J., Fosse, R., Moskowitz, A. & Perry, B.D. (2014) Traumagenic neurodevelopmental model of psychosis revisited, Neuropsychiatry 4 (1): 1-15

Tronick, E. & Perry, B.D. (2015) The multiple levels of meaning making and the first principles of changing meanings in development and therapy in Handbook of Somatic Psychotherapy (H. Weiss et al., Eds) pp 345-355 North Atlantic Books, Berkeley CA

Beeghly, M., Perry, B.D., & Tronick, E.. (2016) "Self-Regulatory Processes in Early Development." Oxford Handbooks Online. 2016-02-11. Oxford University Press. http://www.oxfordhandbooks.com/view/10.1093/oxfordhb/9780199739134.001.0001/oxfordhb-9780199739134-e-3&gt

Perry, B.D. (2017) Trauma- and stress-related disorders in Textbook of Child and Adolescent Psychopathology: Third Edition in (Theodore P. Beauchaine and Stephen P. Hinshaw, Eds) Wiley, New York pp 683-705

Lucero, I. (2018) Written in the body? Healing the epigenetic molecular wounds of complex trauma through empathy and kindness. Journal of Child & Adolescent Trauma https://doi.org/10.1007/s40653-018-0205-0

Core elements of the Neurosequential Model of Therapeutics

Perry, B.D. (2006) The Neurosequential Model of Therapeutics: Applying principles of neuroscience to clinical work with traumatized and maltreated children In: Working with Traumatized Youth in Child Welfare (Nancy Boyd Webb, Ed.), pp. 27-52, The Guilford Press, New York

Perry, B.D. & Hambrick, E. (2008) The Neurosequential Model of Therapeutics. Reclaiming Children and Youth, 17 (3) 38-43

Perry, B.D. (2009) Examining child maltreatment through a neurodevelopmental lens: clinical application of the Neurosequential Model of Therapeutics. Journal of Loss and Trauma 14: 240-255

Perry, B.D. & Dobson, C.D. (2009) Surviving childhood trauma: the role of relationships in prevention of, and recovery from, trauma-related problems. Counselling Children and Young People: Journal of CCYP, a division of British Association for Counseling and Psychotherapy, March, 2009 28-31

Ludy-Dobson, C. & Perry, B.D. (2010) The role of healthy relational interactions in buffering the impact of childhood trauma in Working with Children to Heal Interpersonal Trauma (Eliana Gil, Ed.) pp 26-44 The Guilford Press, New York

Prasad, N. (2011) Using a neurodevelopmental lens when working with children who have experienced maltreatment: A review of the literature of Bruce Perry. Children, Young People and Families Research and Program Development, Social Justice Unit, UnitingCare, Paramatta, NSW, 1-17

Gaskill. R. L. & Perry, B.D. (2012) Child sexual abuse, traumatic experiences and their effect on the developing brain in Handbook of Child Sexual Abuse: Identification, Assessment and Treatment (P. Goodyear-Brown, Ed) pp. 29-49 John Wiley & Sons, Hoboken

MacKinnon, L. (2012) The Neurosequential Model of Therapeutics: An interview with Bruce Perry. The Australian & New Zealand Journal of Family Therapy, 33:3 pp 210-218 doi:10.1017/aft.2012.26

Gaskill, R.L. & Perry, B.D. (2014) Using the Neurosequential Model of Therapeutics to guide play therapy with maltreated children. In Play and Creative Arts Therapy for Attachment Trauma (C. Malchiodi & D. Crenshaw, Eds) 178-194, Guilford Press, New York

Perry, B.D., Hambrick, E. & Perry, R.D (2016) A neurodevelopmental perspective and clinical challenges.

In Trauma Related to Intercountry and Transracial Adoptions (Rowena Fong & Ruth McCoy, Eds) pp 126
– 153, Columbia University Press, New York

Perry, B.D., Davis, G., Griffin, E., Perry, J.A. & Perry, R.D. (2018) The impact of neglect, trauma and maltreatment on neurodevelopment: Implications for the juvenile justice system in The Wiley-Blackwell Handbook of Forensic Neuroscience (Anthony R. Beech, Adam J. Carter, Ruth E. Mann & Pia Rotshtein Eds.) pp 814-816, John Wiley & Sons Ltd, London

Application and outcomes using the Neurosequential Model

Jackson, A., Frederico, M., Tanti, C. & Black, C. (2009) Exploring outcomes in a therapeutic service response to the emotional and mental health needs of children who have experienced abuse and neglect in Victoria, Australia. Child and Family Social Work, 14: 198-212. *(NMT contributes to Take Two Berry Street clinical model; early-certification in NMT)*

Bryson, S., Akin, B., Moore, T. & O'Brien, M. (2010) Youthville Trauma Recovery Center Evaluation, Year One Report to Office of Child Welfare and Children's Mental Health, University of Kansas School of Social Welfare. Lawrence, KS *(Improved outcomes for clients served in Year 1 of NMT based Trauma Recovery Center)*

Eide-Midtsand, N. (2010) Behind a dark gaze, Part 1: Behavioral problems as an expression of the brain's response system to stress and danger. Tidsskrift for Norsk Psyckologforening 47: 1098-1102.

Eide-Midtsand, N. (2011) Behind a dark gaze, Part 2: Therapy with a five-year-old in view of recent findings in brain research. Tidsskrift for Norsk Psyckologforening 48: 144-149.

Barfield, S., Gaskill, R., Dobson, C. & Perry, B.D. (2011) Neurosequential Model of Therapeutics© in a Therapeutic Preschool: Implications for Work with Children with Complex Neuropsychiatric Problems. International Journal of Play Therapy. Online First Publication, October 31, 2011. Doi:10.1037/a0025955

Zarnegar, Z. (2011) Learning the dance of connection: helping a foster mother and a child with Fetal Alcohol Spectrum Disorder. Zero to Three Journal, July 2011, 26-30

Mackenzie, J. (2012) Using a trauma-based approach to promote the education of troubled adolescents. Presented at: 3rd International Conference on Violence in the Health Sector, Vancouver, BC (*frequency of restraints and floor holds significantly decreased following introduction of NMT related practices*)

Grove, T. (2012) Outcomes from a pilot project examining the NMT in a residential treatment center. Report to Shaw Foundation (NMT Grant to St. Aemelian-Lakeside), Milwaukee, WI *(Positive outcomes included higher percentage of responders to Tx and larger drops in CAFAS scores with NMT-guided intervention).*

Hansen, L. & Lusk, R. Sensorimotor intervention for children who have experienced trauma: a pilot study. Pp. 1-64 Lambert Academic Publishing, (2012) *(The study incorporated the principles of NMT in* interventions with children who experienced complex trauma. Following the intervention, significant results were found, including improvements in positive behavior and emotional regulation.)

Perry, B.D. & Dobson, C. (2013) Application of the Neurosequential Model (NMT) in maltreated children. In Treating Complex Traumatic Stress Disorders in Children and Adolescents, (J. Ford & C. Courtois, Eds) Guilford Press, New York, pp. 249-260.

Anich, Z. & King, E. (2013) Trauma, neuroscience and SEBN: an evaluation of training. Presentation at:

Annual Conference for Educational Psychologists in Scotland (Overview of NMT training process and implementation in Sound Lanarkshire Council Psychological Service).

Perry, B.D. (2014) The Neurosequential Model of Therapeutics in young children. In Infant and Early Childhood Mental Health: Core Concepts and Clinical Practice. (K. Brandt, B.D. Perry, S. Seligman & E. Tronick, Eds) American Psychiatric Press, Washington DC, pp. 21-54.

Sori, C.F. & Schnur, S. (2013) Integrating a neurosequential approach in the treatment of traumatized children: an interview with Eliana Gil, Part II The Family Journal: Counseling and Therapy for Couples and Families xx(x) pp. 1-8 DOI: 10.1177/1066480713514945

Cross, D.R. & Purvis, K.B. (2013) Non-pharmacological interventions for children and youth in care. (http://texascasa.org/wp-content/uploads/2013/11/Non-pharmacological-Interventions-Dr.-Purvis.pdf)

Perry, B.D. (2013) A conversation about trauma assessment and intervention Casey Practice Digest, 4: June 2013 pp. 5-8

Clark, D. & Palinkas, J. (2013) Comparing parent perceptions of two programs for young children exposed to domestic violence: Neurosequential Model of Therapeutics (NMT) and psycho-educational play therapy. Mount Royal University, Centre for Child Well-Being, Calgary (Both interventions resulted in improvements overall; Achenbach overall scores in NMT-informed groups demonstrated superior improvement in comparison to the psychoeducational play therapy groups.)

Zarnegar, Z., Hambrick, E., Perry, B.D., Azen, S. & Peterson, A. (2016) Clinical improvements in adopted children with Fetal Alcohol Spectrum Disorders through neurodevelopmentally-informed clinical interventions: a pilot study. Clinical Child Psychology and Psychiatry 1-17 DOI: 10.1177/1359104516636438 (A case series in young children with Fetal Alcohol Spectrum disorder. *Significant improvement in ASQ, PSI and BDI following NMT assessment and NMT-directed therapeutic intervention.)*

Clark, D. & Palinkas, J. (2014) Adaptive functioning of children exposed to domestic violence: parent perceptions of the Neurosequential Model of Therapeutics and a psychoeducational play therapy model. Executive Summary for YWCA Calgary, Mount Royal Centre for Child Well-Being, Calgary

Wang, E., Wilkes, T.C., Perry, B.D. & McMaster, F. (2015) Open trial of the Neurosequential Model of Therapeutics (NMT) approach in a clinical setting. 28th Annual Sebastian Littman Research Day, University of Calgary (*CAFAS scores showed a significant reduction of 59% ($t = 10.97$, $p < 0.001$). Cortical Modulation Ratio showed a 45% increase ($t = 8.510$; $p < 0.001$). There was a negative correlation between baseline Cortical Modulation Ratio and Post CAFAS scores ($r = 0.533$, $p = 0.031$).)*

De Nooyer, K.M. and Lingard, M. (2016) Applying principles of the Neurosequential Model of Therapeutics across an adolescent day program and inpatient unit. Australasian Psychiatry 2016 Jul 12, pp 1-4, PMID: 27406931 DOI: 10.1177/1039856216658824

Jackson, A., Frederico, M., Cox, A. & Black, C. (2017) The treatment of trauma: the Neurosequential Model and "Take Two". In Traumatized People: Psychotherapy seen through the lens of diverse specialist treatments (ed. Bernd Huppertz) in press.

Frederico, M., Jackson, A., Black, C. & Pawsey, R. (submitted: 2016) Take Two: Implementing a therapeutic service for children who have experienced abuse and neglect: beyond evidence-informed practice (The program's practice framework and the subsequent contribution of the Neurosequential Model of Therapeutics (NMT) is described)

Steinkopf, H., Bræin, M.K. & Nordanger, D. Ø. (2017) Kartlegging av barn med "The Neurosequential Model of Therapeutics" Journal of the Norwegian Psychological Association (TIDSSKRIFT FOR NORSK

PSYKOLOGFORENING 2017 S. 958–969 FAGFELLEVURDERT)

Patti, M.S., Grappolini, C. & Luberti, R. (2017) Gli effetti della violenza e della trascuratezza sullo sviluppo emotive, cognitivo e neurobiologico del bambino. Il Neurosequential Model of Therapeutics di Bruce Perry in *Violenza Assistita, Separazioni Traumatiche, Maltratattamenti Multiipli: Percorsi di protezione e di cura con bambini e adulti*. (Roberta Luberti & Caterina Grappolini, Eds) Erickson, Trento (ITALY) pp 115-131.

Gaskill, R.L. & Perry, B.D. (2017) A neurosequential therapeutics approach to guided play, play therapy, and activities for children who won't talk in What to Do When Children Clam Up in Psychotherapy: Interventions to Facilitate Communication (Cathy A. Malchiodi and David A. Crenshaw, Eds) pp 38-66

Walter, S. (2017) Early experience in the Neurosequential Model in Education (NME). Canadian Journal for Teacher Research. (http://www.teacherresearch.ca/blog/article/2016/10/30/314-early-experiences-in-the-neurosequential-model-in-education. Retrieved 10/18/17).

Ryan, K., Lane, S.J. & Powers, D. (2017) A multidisciplinary model for treating complex trauma in early childhood. International Journal of Play Therapy 26, No.2: 111-123 http://dx.doi.org/10.1037/pla0000044 (Description of a model based upon NMT and using NMT metrics as central component of the clinical approach).

Hambrick, E., Brawner, T., Perry, B.D., Wang, E., Griffin, G., DeMarco, T., Capparelli, C., Grove, T., Maikoetter, M., O'Malley, D., Paxton, D., Freedle, L., Friedman, J., Mackenzie, J., Perry, K.M., Cudney, P., Hartman, J., Kuh, E., Morris, J., Polales, C. & Strother, M. (2018) Restraint and critical incident reduction following introduction of the Neurosequential Model of Therapeutics (NMT). Residential Treatment for Children & Youth, http://www.tandfonline.com/doi/full/10.1080/0886571X.2018.1425651

(Reduction of restraints (more than 60%, P<0.001) and critical incidents (50%, p< 0.005) following introduction of the NMT; 10 sites, 3 countries, avg. duration of observation was over 60 months, 2700 clients with estimated $1.5 million savings.)

Reports/Theses/Dissertations examining the NMT or Using NMT Core Dataset

Hansen, L. (2011) Evaluating a Sensorimotor Intervention in Children who have Experienced Complex Trauma: A Pilot Study. Thesis: Honors Projects, Illinios Weslyan University. Paper 151 http://digitalcommons.iwu.edu/psych_honproj/151

Eichler, E. (2012) Talking through the body: a comparative study of cognitive-behavioral and attachment- based treatments for childhood trauma. Thesis: Masters of Social Work, Smith College

Holcomb, M. C. (2014) The clinical implications of dissolutioned adoption: a theoretical intersection of the neurosequential model of therapeutics and attachment theory. Thesis: Masters of Social Work, Smith College. Theses, Dissertations, and Projects. Paper 791

Caplis, C.F. (2014) Feasibility and perceived efficacy of the Neurosequential Model of Therapeutics. Dissertation: Doctorate in Psychology, Antioch University: New England

Taylor, M. (2014) Not in isolation: the importance of relationships and healing in childhood trauma Report on 2013 Creswick Fellowship for the Creswick Foundation. Berry Street, Melbourne VIC, AU

Sando-Pederson, A. M. (2015) A discussion of the Neurosequential Model of Therapeutics based upon a study of how early trauma affects the development of the brain. Master's thesis, University of Copenhagen (DK)

Whyde, J. & Boldman-Buzard, J. (2017) Building Better Lives: Promoting Healthy Children, Strong Families and Thriving Communities. Franklin County Family and Children First Council. Columbus OH. (Report on the introduction of the Neurosequential Model into Franklin County schools and related systems. Outcome from sample elementary schools (e.g., decrease in suspensions from 149 to 12 per year following the introduction of the NME).

Albright, J.G. (2017) Art therapy as a bottom-up processing intervention in the contextual framework of the Neurosequential Model of Therapeutics. Dissertation: Doctorate in Art Therapy, Mount Mary University, Milwaukee, WI

Felker, P. (2017) The relationships between adverse events, relational health events, and adaptive dissociation in clinical sample of adolescents. Dissertation: Doctorate in Social Work. Widener University, Chester, PA.

Research Reports (Using NMT Core Dataset)

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Evidence- based practice and the NMT

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Practice, Program &Policy Implications

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(NMT listed as Evidence-based Practice or EBP)

Other Recognitions

The Minister of Human Services and the Alberta government selected The Preadolescent Treatment Program at Hull Services in Calgary (an NMT Flagship Program) as one of three best practice sites in Alberta (2014).

The Center for the Study of Social Policy (CSSP), a national think tank based in Washington, D.C., has selected SaintA's trauma informed care work (using the NMT as a core element) as one of 15 exemplary initiatives that are innovative in helping youth thrive. SaintA (an NMT Flagship Program based in Milwaukee, WI) was selected out of 136 applications submitted from across the nation. (2014)

Take Two of Berry Street ((an NMT Flagship Program in Melbourne, VIC, AU) was recommended for the exceptional rating of 'extensive achievement' (EA) regarding assessment during the 2015 biennial quality accreditation cycle in relation to national health standards (Australia). This rating was based upon the use of the NMT and in particular the NMT Fidelity process and cross-organization benchmarking allowed by the NMT fidelity exercises.

In 2015 the Federally funded National Quality Improvement Center for Adoption/Guardianship Support and Preservation (QIC-AG: http://qic-ag.org) rated the NMT as Level 3 Promising Practice (see above)

and in 2016 NMT was selected as the emerging best-practice framework to include in an RCT in one of the primary Phases of this five-year program project dedicated to the development of best practices in Child Welfare.

In 2016 the Ministry of Human Services in Alberta, Canada (Alberta Humans Services) formally announced that they would be using the Neurosequential Model of Therapeutics (NMT) as the practice framework to support therapeutic work with at-risk, maltreated and traumatized children and youth.

Health & Medicine Policy Research Group (2017) The Parent-child dyad in the context of child development and child health. The Illinois ACEs Response Collaborative. NMT included in list of key emerging practices.

For more information: ChildTrauma.org