

Year in Review

As 2021 comes to a close I am incredibly thankful for the outstanding work of the Motor Development Lab's bi-coastal team at Virginia Commonwealth University and at the University of Southern California. With site specific lab meetings, joint lab meetings, Developmental Discussion group, behavioral coding across the labs, data sharing, and joint publications you would never know that thousands of miles separate these collaborative teams. While COVID has been a challenge in many ways, comfort with Zoom based meetings has been a blessing. Team work allowed for frequent adaptation moving from 100% remote assessment and intervention to 100% in person assessment and intervention, and flexible home/lab based work models. Everyone has stepped up to help a team member juggling family, research, or personal challenges demonstrating a commitment to a healthy and supportive work environment in the face of COVID and racial unrest.

The MDL has persevered and had a highly productive 2021. With four ongoing projects, five new funded projects, 10 trainee awards, and 4 short term trainees in 2021 it is clear that this team has a lot to contribute to the field of developmental disability research and growing the evidence for Pediatric Physical Therapy. MDL researchers presented 6 posters / platforms virtually, participated in 4 national symposia or keynote addresses, and published 11 papers in peer reviewed journals. In addition, multiple members of the MDL have been active participants in advocacy and mentoring to enhance diversity in the rehabilitation workforce, striving to increase participation of families from underrepresented groups in development research, ensuring our work is inclusive of the needs of all people.



The Motor Development Lab is also incredibly thankful for the 50+ families that have been a part of our research over the last year. We recognize that families were under incredible stress during 2021, after a year of COVID lockdowns, homeschooling older children, challenging financial and social time. So thank you to all the families who were willing to give remote assessment or intervention at try, provided feedback on your experience, came to the lab, let us come to your home, and answer endless questions about COVID exposure or symptoms before every in person interaction. Sharing in the life of your child, watching them grow and develop, and learning through this research is a tremendous gift. We hope you have enjoyed your participation and find this newsletter a welcome overview to the work you have contributed to.

- Stacey C. Dusing, PT, PhD, FAPTA Director,
Motor Development Lab

Ongoing Projects

Does Timing Matter? Supporting Play and Exploration and Developmental Intervention (SPEEDI)

This ongoing clinical trial has enrolled 60 of the anticipated 90 infants born very preterm. This year our first participants completed their 2 year old follow up visits. We completed enrollment in the optional brain imaging study for preterm infants who were enrolled in this study and started to present research and publish papers on the development of infants born very preterm. We will not be able to share the comparison for usual care, SPEEDI_Early, and SPEEDI_Late until late 2022 or early 2023. But look forward to sharing findings with families and the therapy community as soon as possible.

Funding: Eunice Kennedy Shriver National Institute of Child Health and Development. [NCT 03518736](#)



Sitting Together and Reaching To-Play

The original study of the efficacy of usual care plus START-Play compared to usual care alone was completed and the results published this year. (see reference #) The findings suggested that adding START-Play to usual care resulted in improved outcomes for children with significant motor impairments. We recently completed long term follow up to 3 years post-enrollment at all 5 sites across the USA. The long term impact of START-Play will be shared when the analysis is complete.

Funding: Institute of Educational Science. [NCT 02593825](#)



TEDI-PREM



Telerehabilitation for early intervention to improve neurodevelopment outcomes of infants born preterm and their parents' well being: a randomized clinical trial. The clinical trial will enroll over 300 infants in Victoria Australia starting in early 2022. TEDI-PREM extends the collaboration of Stacey Dusing and Alicia Spittle adding a mental health component and lengthening the SPEEDI intervention. The use of the telemedicine platform will allow us to evaluate a system that has been crucial during COVID, but has had little research.

Funding: Australian Government Health Department Medical Research Future Fund (MRFF). [ACTRN12621000364875](#)

SIT-PT



SIT-PT is a 5 year clinical trial that extend the work started in the START-Play original study. The purpose of the SIT-PT study is to compare the effectiveness of two physical therapy interventions — MORE-PT and START-Play — while providing the same amount (dose) of intervention to participants in both groups. Enrollment began in early 2021 with 20 of the anticipated 150 children with neuromotor dysfunction or early signed of Cerebral Palsy enrolled across 3 sites so far. While COVID delayed our start and required a slower start up to ensure staff and families were adequately protected, we are in full swing and actively seeing participants who are 7-24 months of age and have some signs of atypical neurological development and a motor delay. [Know someone who might be interested in participating?](#)

Funding: Eunice Kennedy Shriver National Institute of Child Health and Development. [NCT04230278](#)





New Projects

Therapeutic Intervention Supporting Development From NICU to 6 Months for Infants Post Hypoxic-Ischemic Encephalopathy

This collaborative project between MDL Director Dr. Dusing and DIMPL Director Dr. Barbara Sargent will evaluate the feasibility and begin to evaluate the effect of a sensorimotor intervention (SMI) provided in the first 6 months of life. Twenty infants with moderate or severe HIE will be recruited and randomized into one of two groups: 1) standard care, and 2) standard care plus SMI. Infants in the SMI group will receive 2 intervention sessions in the NICU and 8 sessions in the home from 1 week to 6 months post discharge. The SMI will focus on supporting parents' ability to enhance motor-based problem solving and global development during the transition from NICU to home. Through this combined parent and therapist support intervention, the parents are empowered to provide their infants daily opportunities for sensorimotor play, increasing the likelihood of developmental change. Enrollment at the Children's Hospital of Los Angeles will be in early 2022.

Funding: NICHD via C-Progress NCT05130528

Development of a Research Consortium and Planning a Proposal to evaluate the Efficacy of STEPS H2

This planning grant bring together research from physical therapy, occupational therapy, nursing, neonatology, early education, and family members to build a research program to enhance research on the transition from the NICU to home. The team is preparing several federal grants for submission in 2022 and conducting focus groups with parents and providers. Interested in sharing your insights on parenting a preterm infant or providing care in the NICU of early intervention? Call us at the MDL.

Funding: Academy of Pediatric Physical Therapy

Effects of posture and seating on learning opportunities for infants at risk for cerebral palsy

This project, led by Dr. Kari Kretch will examine immediate and developmental effects of posture on object exploration and social attention in 8-14-month-old infants at high risk for cerebral palsy (CP). Enrollment is underway. Please contact MDL if you or someone you know want more information.

Funding: APTA Pediatrics

Measuring daily experience in infants at risk for cerebral palsy

This project led by Dr. Kari Kretch aims to: 1) establish the feasibility of parent-mediated Ecological Momentary Assessment (EMA) for measuring daily experience in infants at risk for CP, and 2) Describe positioning and seating experience in infants at risk for CP, compared to their typically developing peers.

Measuring Gross Motor Function Change in 3- to 24-Month-Old Children with or at High Risk for CP: Validation of the Gross Motor Function Measure 66 Item Sets.

The project, lead by Natalie Koziol at University of Nebraska-Lincoln will evaluate the validity of the Gross Motor Function Measures in infants as young as 3 months.

Funding: American Academy of Cerebral Palsy and Developmental Medicine

Implementing the Baby Bridge Program via Telemedicine

This pilot project led by Dr. Bobbi Pineda, USC Occupational Science, will begin to evaluate the implementation of the Baby Bridge parent support programs via telemedicine.

Funding: Occupational Therapy Research Foundation



Achievements

The following grants and scholarships were awarded to MDL mentees.

National Institute of Child Health and Human Development (NIH/NICHD).

1F31HD104411-01A1. Exploring Emotional Availability During Parent-Child Interaction in Children with Developmental Delays
PI R Molinini
\$42,636 / year for up to 3 years

Foundation for Physical Therapy Research, Promotion of Doctoral Studies II Award.

Rebecca Molinini, PT, DPT, at Virginia Commonwealth University
Project Titled: "Emotional Availability During Parent Child Interaction in Children with Developmental Delays"
Equally funded through APTA PODS Fund and the Legacy Scholarship Fund \$15,000

Foundation for Physical Therapy Research, Promotion of Doctoral Studies I Award.

Dana McCarty, PT, DPT, at The University of North Carolina at Chapel Hill
Project Titled: "Contextual factors impacting parent presence in the NICU: Enhancing preterm infant motor development through parental support"
Recipient of the Pediatric PODS Award funded by the Academy of Pediatric Physical Therapy Fund, \$7,500

Academy of Pediatric Physical Therapy, Mentored Research Grant

Title: Exploring the Impact of Emotional Availability on the Efficacy of Physical Therapy Intervention
PI/Mentee: Rebecca Molinini
Total Funding: \$10,000
Overall aim: To measure changes over time in emotional availability of the parent child dyad when the parent is playing with the infant with or without motor delays.

USC Center Changing Family.

Effects of SPEEDI Intervention on Parent-Child Interaction in Preterm Infants. PI: Kari Kretch.
Total Funding: \$2500

Shirley Ryan Ability Center, Center for Smart Use of Technology to Assess Real-world Outcomes (CSTAR).

Title: "Remote tracking of tummy time in term and preterm infants in real-world settings using wearable sensors: A validation study."
Role: Mentor to PI Virginia Chu and PhD student Ketaki Inamdar, MS
Total Funding: \$25,000

USC Fall 2021 Provost's Research Fellowship

Effect of Brain Injury Location on Problem Solving Skills in Preterm Infants
Claire Rhee, University of Southern California Neuroscience Program

Academy of Pediatric Physical Therapy, Systematic Review Grant

Title: Efficacy of Rehabilitation Professional-Provided Parenting Interventions for Families with Young Children with Developmental Disabilities, Ages Birth to Three Years
PI/Mentee: Corri Stuyvenberg, PT, PhD student
Total Funding: \$2,500

Academy of Pediatric Physical Therapy, Systematic Review Grant

Title: Effect of motor intervention on cognition, communication, and social interaction in children with autism spectrum disorder
PI/Mentee: Judy Zhou, PT, PhD student
Total Funding: \$2,500

Academy of Pediatric Physical Therapy, Mentored Research Grant

Title: Effects of posture and seating on learning opportunities in infants at risk for cerebral palsy
PI/Mentee: Kari Kretch, PT, PhD, Post-doctoral fellow
Total Funding: \$10,000 initial award + \$5,000 supplemental

Publications

Kretch, K. S., Koziol, N. A., Marcinowski, E. C., Kane, A. E., Inamdar, K., Brown, E. D., Bovaird, J. A., Harbourne, R. T., Hsu, L., Lobo, M. A., & Dusing, S. C. (in press). Infant posture and caregiver-provided cognitive opportunities in typically developing infants and infants with motor delay. *Developmental Psychobiology*.

Khurana S, Evans ME, Kelly CE, Thompson DK, Burnsed JC, Harper AD, Hendricks-Muñoz KD, Shall MS, Stevenson RD, Inamdar K, Vorona G, Dusing SC. Longitudinal Changes in the Sensorimotor Pathways of Very Preterm Infants During the First Year of Life With and Without Intervention: A Pilot Study. *Dev Neurorehabil*. 2021 Oct;24(7):448-455. doi: 10.1080/17518423.2021.1903602. Epub 2021 Jun 23. PubMed PMID: 34160340; PubMed Central PMCID: PMC8429051.

Khurana S, Rao BK, Lewis LE, Kumaran SD, Kamath A, Einspieler C, Dusing SC. Neonatal PT Improves Neurobehavior and General Movements in Moderate to Late Preterm Infants Born in India: An RCT. *Pediatr Phys Ther*. 2021 Oct 1;33(4):208-216. doi: 10.1097/PEP.0000000000000824. PubMed PMID: 34618744.

Matthews ND, Rowley KM, Dusing SC, Krause L, Yamaguchi N, Gordon J. Beyond a Statement of Support: Changing the Culture of Equity, Diversity, and Inclusion in Physical Therapy. *Phys Ther*. 2021 Sep 2; doi: 10.1093/ptj/pzab212. [Epub ahead of print] PubMed PMID: 34499177.

Molinini RM, Koziol NA, Marcinowski EC, Hsu LY, Tripathi T, Harbourne RT, McCoy SW, Lobo MA, Bovaird JA, Dusing SC. Early motor skills predict the developmental trajectory of problem solving in young children with motor delays. *Dev Psychobiol*. 2021 Sep;63(6):e22123. doi: 10.1002/dev.22123. Epub 2021 May 4. PubMed PMID: 33942902.

Morgan C, Fetters L, Adde L, Badawi N, Bancale A, Boyd RN, Chorna O, Cioni G, Damiano DL, Darrah J, de Vries LS, Dusing S, Einspieler C, Eliasson AC, Ferriero D, Fehlings D, Forssberg H, Gordon AM, Greaves S, Guzzetta A, Hadders-Algra M, Harbourne R, Karlsson P, Krumlinde-Sundholm L, Latal B, Loughran-Fowlds A, Mak C, Maitre N, McIntyre S, Mei C, Morgan A, Kakooza-Mwesige A, Romeo DM, Sanchez K, Spittle A, Shepherd R, Thornton M, Valentine J, Ward R, Whittingham K, Zamany A, Novak I. Early Intervention for Children Aged 0 to 2 Years With or at High Risk of Cerebral Palsy: International Clinical Practice Guideline Based on Systematic Reviews. *JAMA Pediatr*. 2021 Aug 1;175(8):846-858. doi: 10.1001/jamapediatrics.2021.0878. PubMed PMID: 33999106.

Stuyvenberg CL, Brown SE, Inamdar K, Evans M, Hsu LY, Rolin O, Harbourne RT, Westcott McCoy S, Lobo MA, Koziol NA, Dusing SC. Targeted Physical Therapy Combined with Spasticity Management Changes Motor Development Trajectory for a 2-Year-Old with Cerebral Palsy. *J Pers Med*. 2021 Feb 27;11(3). doi: 10.3390/jpm11030163. PubMed PMID: 33673573; PubMed Central PMCID: PMC7997196.

Harbourne RT, Dusing SC, Lobo MA, McCoy SW, Koziol NA, Hsu LY, Willett S, Marcinowski EC, Babik I, Cunha AB, An M, Chang HJ, Bovaird JA, Sheridan SM. START-Play Physical Therapy Intervention Impacts Motor and Cognitive Outcomes in Infants With Neuromotor Disorders: A Multisite Randomized Clinical Trial. *Phys Ther*. 2021 Feb 4;101(2). doi: 10.1093/ptj/pzaa232. PubMed PMID: 33382406; PubMed Central PMCID: PMC7910024.

Molinini RM, Koziol NA, Tripathi T, Harbourne RT, McCoy SW, Lobo MA, Bovaird J, Dusing SC. Measuring Early Problem-Solving in Young Children with Motor Delays: A Validation Study. *Phys Occup Ther Pediatr*. 2021;41(4):390-409. doi: 10.1080/01942638.2020.1865501. Epub 2021 Feb 1. PubMed PMID: 33517815.

Inamdar K, Molinini RM, Panibatla ST, Chow JC, Dusing SC. Physical therapy interventions to improve sitting ability in children with or at-risk for cerebral palsy: a systematic review and meta-analysis. *Dev Med Child Neurol*. 2021 Apr;63(4):396-406. doi: 10.1111/dmcn.14772. Epub 2020 Dec 14. PubMed PMID: 33319378.

Cunha AB, Babik I, Koziol NA, Hsu LY, Nord J, Harbourne RT, Westcott-McCoy S, Dusing SC, Bovaird JA, Lobo MA. A Novel Means-End Problem-Solving Assessment Tool for Early Intervention: Evaluation of Validity, Reliability, and Sensitivity. *Pediatr Phys Ther*. 2021 Jan 1;33(1):2-9. doi: 10.1097/PEP.0000000000000761. PubMed PMID: 33337765.

Rosales MR, Rohloff P, Vanderbilt DL, Tripathi T, Valentini NC, Dusing S, Smith BA. Collecting Infant Environmental and Experiential Data Using Smartphone Surveys. *Pediatr Phys Ther*. 2021 Jan 1;33(1):47-49. doi: 10.1097/PEP.0000000000000766. PubMed PMID: 33337776.

An M, Nord J, Koziol NA, Dusing SC, Kane AE, Lobo MA, McCoy SW, Harbourne RT. Developing a fidelity measure of early intervention programs for children with neuromotor disorders. *Dev Med Child Neurol*. 2021 Jan;63(1):97-103. doi: 10.1111/dmcn.14702. Epub 2020 Oct 13. PubMed PMID: 33051867.



MDL Hosted Events Coming in 2022

2022 SYKES SYMPOSIUM

Early Detection for Infant and Children With or At-High-Risk of Cerebral Palsy

University of Southern California Health Sciences Campus, Los Angeles, CA

The Sykes Family Chair in Pediatric Physical Therapy, Health and Development in the Division of Biokinesiology and Physical Therapy strives to advance health and development of children with and without disabilities. This symposium is designed to provide opportunities to make connections between disciplines, clinicians, researchers, and advance interdisciplinary research and knowledge translation.

Keynote Presentations from:



Colleen Peyton DPT



Stacey Dusing PhD PT FAPTA



Andrea Guzzetta MD PhD

...plus local and national implementation examples and a parent panel!

DATES:

April 22, 2022 12:00 PM - 5:00 PM; 0.5 Continuing Education Units

April 23, 2022 8:30 AM - 5:00 PM; 0.7 Continuing Education Units

VISIT OUR WEBSITE FOR MORE INFORMATION & REGISTRATION: <https://cvent.me/v7znZ9>

OR SCAN QR CODE



This event will be preceded by the Precht's Method of the Qualitative Assessment of General Movements Course, use the link for more info: <https://cvent.me/5aVnrR>

REGISTRATIONS OPEN

PRECHTL'S METHOD OF THE QUALITATIVE ASSESSMENT OF GENERAL MOVEMENTS

BASIC & ADVANCED COURSE



The Precht's Method of the Qualitative Assessment of General Movements in young infants has shown its merit for the prenatal and postnatal evaluation of the integrity of the nervous system. Compelling evidence is available that the assessment of General Movements at a very early age is the best predictor for cerebral palsy. The basic course will provide an introduction and training in use of these assessments. The advance course will extend previously trained participants skills. Through lectures, demonstrations and exercises, attendees will learn:

- The ontogeny of spontaneous motor activity
- Normal and abnormal General Movements (GMs) from birth to 20 weeks post-term
- Practical instructions for recording and assessing GMs
- GMs and follow-up: individual developmental trajectories and their predictive power for later neurological impairments
- Advanced only: review scoring of participants own videos to gain expert feedback in interpretation

Dates

Tuesday April 19, 2022: 9:00AM – 5:00PM
Wednesday April 20, 2022: 9:00AM – 5:00PM
Thursday April 21, 2022: 9:00AM – 5:00PM
Friday April 22, 2022: 9:00AM – 12:00PM

Cost

Basic Course: \$990 USD
Advanced Course: \$1090 USD

Location

Hyatt House at the University of Southern California Health Sciences Campus, Los Angeles, CA

Register

Please visit our website to register: <https://cvent.me/5aVnrR> or scan the QR code.

Who Should Attend

- Neonatologist or Neurologists
- Occupational or Physical Therapist
- Nurse or Nurse Practitioners

 USC University of
Southern California



This event will be followed by the Sykes Symposium, use the link to learn more: <https://cvent.me/v7znZ9>



Meet Our New Full-Time Team Members



While not actually new to the USC MDL, Dr. Kretch moved from a Post-doctoral Fellow to a Assistant Research Professor position in Sept 2021. She continued her instrumental role in assessment for the SIT-PT study, leads several independent studies, and is an outstanding mentor to the entire MDL team.

Dr. Butera completed her PhD in Occupational Science and joined the MDL at USC as a Post-Doctoral Fellow in Sept 2021.



Jess joined the MDL at USC in June as the lead research assistant. She assists in the day to day management of the lab and research assistants as well as recruitment and communication with participants.

Arya is a first year student in the USC Biokinesiology PhD program. She joined the lab in July after moving from Mumbai, India.



Motor Development Lab



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