

**APTA Academy of Pediatric Physical Therapy (APTA Pediatrics)
Research Agenda 2021-2023**

APTA PEDIATRICS MISSION: Advance pediatric physical therapy through excellence in advocacy, education, and research.

APTA PEDIATRICS VISION: Optimize movement for lifelong meaningful participation of all children.

Opening Statement:

This document describes the broad research vision of the APTA Pediatrics section and the potential areas of investigation that researchers may want to pursue. Topics within each research area have been distinguished using the International Classification of Functioning, Disability and Health: children and youth (ICF-CY) framework and are not limited to certain diagnoses or environments. This document is not designed to be inclusive of all potential research questions and, hence, grant applications that address topics other than those listed in the Appendix may be funded by APTA Pediatrics. Interdisciplinary research collaborations between physical therapists and other professionals as well as collaboration with, and input from, key stakeholders such as clinicians, caregivers, and patients are encouraged, when appropriate, based on the focus, stage, and scale of the research project.

Addendum on the COVID-19 crisis:

APTA Pediatrics supports research topics related to promotion of health, movement, and participation outcomes in individuals directly affected by the COVID-19 pandemic and development of effective ways to address the health disparities and challenges resulting from the pandemic.

Goal of the Research Agenda:

To promote research in pediatric physical therapy that advances and enhances health or movement abilities for all individuals during infancy and childhood, and for families and individuals with chronic childhood conditions throughout the lifecourse.

Objectives:

1. To identify key research areas for the practice of pediatric physical therapy and share these with key research partners and funding agencies.
2. To support the continuing development of a research infrastructure within the APTA Pediatrics that is responsive to the needs of its membership.
3. To enhance knowledge translation and dissemination of research into clinical practice.
4. To promote a diverse, inclusive, and interprofessional research community.

Resources used to update the research agenda:

1. APTA Revised Research Agenda for Physical Therapy, 2018
2. [NICHD Strategic Plan 2020](#)
3. [NINDS/ NICHD Strategic Plan for Cerebral Palsy Research 2017 Version](#)
4. [NICHD/NCMRR Rehabilitation Plan](#)
5. [NICHD Rehabilitation Plan](#)
6. [PCORI National Priorities and Research Agenda](#)
7. [National Center for Special Education Research \(NC SER\), Institute for Education Science](#)
8. [NIMH Strategic Plan 2020](#)
9. [APTA Pediatrics Strategic Plan, 2018-2021](#)

Organizing Framework

The following resources were used to identify and design the organizing framework to capture the primary areas of research focus.

1. International Classification of Functioning, Disability and Health: Children and Youth Version: ICF-CY. (WHO, 2007)
2. The Guide to Physical Therapist Practice 3.0, patient management model.

APTA Pediatrics Research Agenda Objective 1. To identify primary research areas for the practice of pediatric physical therapy and share these with key research partners and funding agencies.

Primary Research Areas (See examples for each area within Appendix)

- A. Basic Science Research
- B. Clinical Research
- C. Epidemiology & Health Services / Disparities Research
- D. Measurement Development and Validation
- E. Knowledge Translation/ Implementation Science
- F. Education Research
- G. Data Sharing and Analytics

Description of Research Areas (See Appendix at the end of this document for examples of topics in each research area)

AREA A: BASIC SCIENCE RESEARCH

Fundamental theoretical or experimental investigative research to advance knowledge in areas related to pediatric physical therapy; may be human subjects research or cellular or animal models or genomics methods or epigenetic studies.

AREA B: CLINICAL RESEARCH

Investigation of etiology, prevention, diagnosis or treatment of health conditions in infants, children, or adults with developmental disabilities across various settings including, but not limited to home, school, clinic, hospital, community, etc.

AREA C: EPIDEMIOLOGY AND HEALTH SERVICES RESEARCH

Investigate factors influencing health policy and health services for children with the goal of advancing specific intervention outcomes and overall health and wellness.

AREA D: MEASUREMENT DEVELOPMENT AND VALIDATION

Develop and refine measurement tools to evaluate impairment-related, functional, and participatory outcomes in infants, children, and adults with developmental disabilities.

AREA E: KNOWLEDGE TRANSLATION / IMPLEMENTATION SCIENCE

Develop and evaluate the efficacy of knowledge translation programs to improve clinical competence and implement interventions for children and adults with developmental disabilities in various healthcare settings.

AREA F: EDUCATION RESEARCH

Establish evidence-based practices to advance education in pediatric physical therapy by conducting single and multi-institutional studies.

AREA G: DATA SHARING AND ANALYTICS

Conduct basic, clinical, or translational research using publicly available, large secondary datasets or administrative records and create aggregated, harmonized datasets by combining data from past studies using common data elements.

APTA Pediatrics Research Agenda Objective 2: To support the continuing development of a research infrastructure within the Academy that is responsive to the needs of its membership.

APTA Pediatrics Research Agenda Objective 3: To enhance knowledge translation and dissemination of research into clinical practice.

APTA Pediatrics Research Agenda Objective 4: To promote a diverse, inclusive, interprofessional research community.

To meet objectives 2,3 and 4, the Director of Research, a member of the APTA Pediatrics Board of Directors, oversees the APTA Pediatrics Research Committees and Liaisons. The Committees and Liaisons not only work to meet the objectives of the APTA Pediatrics Research Agenda, but also support the APTA Pediatrics Strategic Plan, posted on the APTA Pediatrics Website. Ongoing activities include but are not limited to:

1. Reviewing and awarding research grants to APTA Pediatrics members.
2. Mentoring APTA Pediatrics members who are interested in research.
3. Hosting the Knowledge Translation lectureship every 3 years with the Knowledge Translation Committee.
4. Reviewing research abstracts for posters and platforms at Annual Conference and Combined Sections Meetings.
5. Hosting the APTA Pediatrics Research Summits
6. Working with the Foundation for Physical Therapy Research to provide pediatrics grants.
7. Hosting periodic webinars and informational sessions on research related topics.
8. Hosting monthly meetings to discuss current topics in pediatric physical therapy research.

Recommendations from the Task Force:

- 1) Research proposals submitted to the Academy of Pediatric Physical Therapy Clinical Grants competition should focus on the Research Areas identified in this agenda unless instructions in a *Request For Proposal (or Application)* specifically state otherwise.
- 2) Best research designs are those that are best matched to the research question or specific aims and hypotheses, the granting agencies' defined mission and purpose, and available grant funds. The Task Force recommends that grant applicants propose the most appropriate research design to answer their research question or examine their specific aims.
- 3) The Research Agenda is a dynamic document and annual reviews and updates every three years are recommended to be sure areas/priorities are current and to document progress in research activities. The annual reviews should also include review of funding agency priorities.
- 4) Align resources and encourage partnerships between APTA and other organizations to benefit inter-professional, multi-institutional research in pediatric physical therapy through organization of research summits and follow-up planning grants.
- 5) Promote key priority areas through focused grant mechanisms or additional credit/points during the review process for grants within certain priority areas.

Appendix: Examples of research topics within each research area and relationship of each area to federal funding agency goals.

This table includes examples for each research area and is not an all-inclusive list.

EXAMPLES FOR AREA A: BASIC SCIENCE RESEARCH *(Relates to the NICHD goal of understanding the cellular and structural basis of motor and other system development, the NCMRR area of Adaptation and Plasticity, and is a priority area within the NIH Rehabilitation plan)*

Body Structure & Function

- Explore factors that affect growth and development of muscles, bones, neural networks, and other tissues and systems that contribute to movement
- Explore the mechanisms of tissue damage and repair in the musculoskeletal, neuromuscular and cardiorespiratory systems

Activity

- Describe development in infants and children that are typically developing, at risk for movement-related disorders, or are diagnosed with movement-related disorders
- Investigate critical/sensitive periods for neuroplasticity and motor development (e.g. in infancy or after neural injury)
- Examine relationships between motor development and other domains of child development (e.g. cognitive, social, emotional, and language)
- Examine brain-behavior relationships during functional behaviors.

Participation

- Explore physical activity/participation levels in children and adults.

EXAMPLES FOR AREA B: CLINICAL RESEARCH *(Relates to the NICHD goal of*

advancing safe and effective therapies and devices for people with disabilities as well as advancing child and adolescent health and transition to adulthood, the NCMRR areas of Rehabilitation diagnostics and interventions and Technology development, and is a priority area within the NIH Rehabilitation Plan).

Body Structure & Function:

- Identify impairments in children with or at risk for movement-related disorders
- Explore factors associated with movement-related impairments
- Determine the effects of PT interventions and other factors such as nutrition on:
 - o skeletal muscle and tendon (e.g. development and modification of muscle architecture, strength, power, muscle and tendon length, activation patterns, and recovery from injury or surgery)
 - o bones and joints (e.g. development and modification of bone density and architecture, infant head shape, alignment of joints, and recovery from injury or surgery)
 - o central and peripheral nervous system (e.g. development and modification of neural pathways and networks, activity-dependent neural adaptation, regeneration, restoration and compensatory changes after nervous system damage)
 - o the cardiorespiratory system, metabolism and caloric balance (e.g. energy expenditure, aerobic capacity, blood glucose regulation, exercise tolerance, body weight and composition)
 - o pain
- Improve effects of PT interventions on body structures and functions, by incorporating new scientific discoveries into current interventions, developing new interventions, and/or combining PT interventions with complementary treatments (e.g. medications, regenerative and cellular therapies, brain stimulation)

Activity:

- Identify activity limitations in children with or at risk for movement-related disorders
- Determine the effects of PT interventions on motor development, motor control and motor learning for postural control, locomotion, upper limb movement, and other motor skills, in children with or at risk for movement related disorders
- Examine relationships between impairments and activity limitations

Participation

- Identify participation restrictions in children with or at risk for movement-related disorders
- Determine the effects of PT interventions on participation in life situations and on quality of life (e.g. school, recreation, domestic life, interpersonal interactions, family relationships, employment)
- Determine the impact of life transitions (hospital-home, home-school, elementary - middle-high school, high school to college/university, school-adult services, and continued access to care/services (i.e., medical home).
- Examine the impact of PT interventions, including health promotion, on physical activity, sleep patterns, and other developmental outcomes in children who are inactive, overweight or obese due to various factors/diagnoses.

- Examine relationships between impairments, activity limitations, participation, and quality of life in all settings.

Environmental Factors

- Investigate the effects of technology on the effectiveness of PT interventions, participation, and quality of life (e.g. robotic devices, wearable technologies, interactive gaming systems, virtual reality systems, adaptive exercise equipment, digital health, telehealth, and mobile health).
- Investigate the effects of assistive mobility devices, orthotics and prosthetics and related novel tools (e.g. 3D printed devices) on gait and other forms of locomotion or developmental skills in children and adults with developmental movement disorders
- Identify parent, family, home and school characteristics that influence motor development/skill acquisition and responsiveness to PT interventions

Personal Factors

- Identify personal characteristics that influence child development/skill acquisition and responsiveness to PT interventions (e.g. motivation, attention, experience, behavior patterns)

EXAMPLES FOR AREA C: EPIDEMIOLOGY AND HEALTH SERVICES RESEARCH

(Relates to the NICHD goal of advancing public health and lifelong wellness, the NCMRR area of health services research, and the COHSTAR goals of advancing health services and health policy research)

Investigate factors that influence health policy and health services for children with movement disorders

- Improve the profession's capacity to conduct child-centered outcomes research by building data infrastructure and by connecting researchers with potential collaborators, mentors, funding agencies, clinicians and consumers.
- Identify doses of PT interventions that achieve optimal responses (e.g. timing episodes of care, session frequency, duration, intensity, and content, and recommendations for follow through)
- Evaluate service delivery models for pediatric PT, including school based PT and early intervention, and their effects on child-centered outcomes, family-centered outcomes and cost-effectiveness (e.g. integrative and consultative services, primary-provider model, care coordination, natural environments)
- Examine differential outcomes as a function of health disparities across diagnoses, ages, races/ethnicities/cultures, and major life transitions.
- Develop effective interventions to address the aforementioned health disparities.
- Examine the incidence, prevalence and natural course of movement-related health conditions commonly managed by pediatric physical therapists.
- Evaluate the extent to which pediatric physical therapist decision making is based on available evidence and/or recommended practice guidelines.
- Evaluate the effects of health promotion efforts by pediatric physical therapists on longitudinal trends in child health and development.

- Identify factors that contribute to utilization and consumer choice in the selection of pediatric physical therapy services.

EXAMPLES FOR AREA D: MEASUREMENT DEVELOPMENT AND VALIDATION *(Relates to the NICHD goal of advancing safe and effective therapies and devices for people with disabilities and the goal of developing research design and methodology stated in the NIH Rehabilitation plan)*

Body Structure & Function

- Develop and refine measurement tools to identify impairments and monitor changes in the musculoskeletal, neuromuscular and cardiorespiratory systems. (e.g. cardiorespiratory fitness measures for children, or muscle, brain, and other tissue imaging/mapping).
- Develop and refine pain assessment tools for children

Activity

- Develop and refine measurement tools for prediction of developmental outcomes and responsiveness to intervention based on infant motor behavior
- Develop and refine measurement tools to identify activity limitations and monitor changes in postural control, locomotion, upper limb movement and other motor skills in children
- Develop and refine outcome measures specific to various service delivery environments (e.g. school system, early intervention, hospital, NICU)
- Examine the value of motion sensors and other wearables for treatment planning, including selection of PT interventions, orthotics, and surgical procedures, and effects on child-centered outcomes.

Participation

- Develop and refine measures of participation in life situations for children and for adults with developmental disabilities (e.g. fulfillment of life roles in the home, school, community, workplace)
- Develop and refine measures of quality of life in children

Other

- Determine minimal detectable changes and minimal clinically important differences for measures used in pediatric physical therapy practice and research
- Develop a minimum set of measures to evaluate and monitor changes in infants, children, and adults.
- Develop and refine systems for classifying children with movement-related disorders and determining PT diagnoses.

EXAMPLES FOR AREA E: KNOWLEDGE TRANSLATION / IMPLEMENTATION SCIENCE *(Relates to the NICHD goal of advancing safe and effective therapeutics, the NCMRR area of health services research, and the goal of advancing translational science in the NIH Rehabilitation plan)*

- Evaluate the feasibility of a knowledge translation program.
- Develop a national system for web-based knowledge translation.
- Examine the efficacy of a mentoring program to improve knowledge translation.
- Examine the efficacy of knowledge-broker programs to promote knowledge translation in practice.
- Evaluate specific implementation strategies on knowledge awareness, use and

subsequent practice outcomes.

- Examine an organization's readiness to implement evidence-based practices and the context specific barriers and facilitators to implementation.
- Evaluate how organizations effectively embed new interventions or methods of care into practice.
- Determine the organizational/contextual factors that enable the sustained use of evidence in practice.
- Determine important attributes of clinicians that enhance engagement, knowledge use, and implementation in healthcare settings.

EXAMPLES OF AREA F: EDUCATION RESEARCH (*Relates to the educational goals of the Foundation for Physical Therapy, APTA Pediatrics, and APTA Education. In addition, see education research resources provided by ACAPT*)

- Conducting or planning for research that investigates a question of importance to the advancement of education in pediatric physical therapy.
- Research that advances the knowledge of education and learning processes and the development of the tools and methods necessary to support this endeavor.
- Education Research includes but is not limited to the education of DPT or PhD students, pediatric clinicians, fellows, residents or other learners to better inform pediatric clinical practice.
- Area includes multi-institutional studies when possible and when the results of single class or single institution studies have already provided a foundation, studies using established reliable and valid tools for measurement, and studies demonstrating methodological rigor for quantitative, qualitative and mixed designs.

EXAMPLES FOR AREA G: DATA SHARING AND ANALYTICS (*Relates to the NICHD goal of advancing safe and effective therapeutics, the NCMRR area of health services research, the COHSTAR goals of advancing health services and health policy research, and the goal of advancing translational science in the NIH rehabilitation plan*)

- Conduct basic, translational, and clinical research through secondary analysis of existing publicly available and accessible national databases and/or administrative records (e.g., electronic medical or health records).
- Formulate new research questions and test new hypotheses using existing individual or combined data sets.
- Examine large datasets to better understand the variations within certain diagnoses/populations and to determine the complex factors affecting future health and movement outcomes.
- Examine records to improve health systems and infrastructure, reduce health inequalities, increase quality of and access to care, and promote health and movement outcomes.
- Create aggregated, harmonized datasets from multiple ongoing studies and/or legacy data from past research studies using common data elements and share data with other researchers for further secondary analysis.
- Apply novel data mining/analytical tools and advanced computational or statistical approaches for large secondary datasets.

APTA Pediatrics Research Agenda Task Force Members:

Anjana Bhat (Chair)
Jill Heathcock
Maggie O'Neil
Jennifer Sansom
Jennifer Christy (Director of Research)
Alyssa Fiss
Stacey Dusing

PROCESS (updated June 1, 2021):

The following individuals reviewed the 1st draft and provided feedback:

Linda Feters (Editor of Pediatric Physical Therapy)
Michele Lobo (Chair of APTA Pediatrics Grant Review Committee)
Thubi Kolobe (Developed the 1st Research Agenda)
Eunice Shen and Katrin Mattern-Baxter (Research Forum/KT Lectureship Liaisons)
Jan McElroy (Director of Practice)

The following individuals reviewed the 2nd draft and provided feedback:

Parents and self-advocates

The following individuals will review the 3rd draft and provided feedback:

APTA Pediatrics Board of Directors

The 4th draft was posted for public comment (on APTA Pediatrics Forums).