

Transforming Lives 2.0

Designing the Next Generation of Care

The Case for Children's Specialized Hospital and Foundation



THE INITIATIVES AND OUR FUTURE—A \$20M INVESTMENT



CDID



*Center for Discovery,
Innovation and Development*

The Center for Discovery, Innovation, and Development

The Center for Discovery, Innovation, and Development (CDID) is an organization affiliated with Children's Specialized Hospital (CSH), supporting the latter's vision to create a world where all children can reach their full potential. The mission of the Center for Discovery, Innovation and Development is to develop, innovate and discover solutions for the advancement of the lives of children, adolescents, and young adults with special healthcare needs and their families.

Following is information on some of the areas and projects CDID is steering as a leader in health innovation for children with special health and healthcare needs and their families.



VIRTUAL HEALTH

Virtual health is a rapidly growing segment of the healthcare industry. Virtual interventions have become particularly evident during the COVID-19 pandemic, demonstrating benefits to patients, particularly the special healthcare needs populations and their families. Through virtual mediums, patients and families have access to healthcare efficiently and conveniently, which can lead to improved health outcomes and satisfaction with services. **CDID is utilizing and developing virtual health technologies that will fundamentally change how children with special healthcare needs will interact and engage with not only providers, but their world.**

Augmentative reality (AR), virtual reality (VR), mixed reality (MR), apps development, and remote vital sign applications are all initiatives being explored and pursued through CDID and their partnership with like minded, forward thinking companies.

ATENTIVmynd™

Approximate Cost: \$2.5M

CDID's current work with ATENTIVmynd™ has the potential to help millions of children around the world who struggle with Attention-deficit/hyperactivity disorder (ADHD). The goal, and the potential, is to reduce or completely eliminate the need for medication. It may also be an effective treatment for children with other executive functioning challenges such as autism spectrum disorder.

ATENTIVmynd™ is a software-based therapy that continuously monitors a person's attention level through an avatar in an adventure video game. It identifies and targets specific cognitive skills, then trains and measures the user's attention and skills development. The intended result is the transfer of these improved skills to real life.

CDID and ATENTIVmynd™ have an agreement in place to pilot this digital learning platform, as a treatment methodology for children with executive functioning challenges such as ADHD and autism. Worldwide, approximately 7.2% or 129 million children have ADHD and 1 in 160 children have Autism (ASD), with the CDC reporting approximately 1 in 54 US children diagnosed with an Autism Spectrum Disorder.

In 2020, it was reported that among all children ages 2-17 that suffer from ADHD, 62% were taking ADHD medication. Some of the side effects of these medications are sleep problems, delayed growth and loss of appetite. This therapy can occur at home, therefore, making it more accessible and convenient for both the child and caregivers. The ease and prospective effectiveness of this technology makes it a catalyst for global change that has the potential to positively impact millions of children on a global level.



VIRTUAL HEALTH

Telemedicine

Approximate Cost: \$2.5M

Telemedicine helps clinicians improve access to care, treat more patients in the same amount of time, and reduce wait times. **By increasing health care access for children, the use of telemedicine technologies can help reduce missed appointment rates, increase adherence to recommended therapies, and help ensure the appropriate frequency of recommended physician visits.** A well-designed telemedicine platform ensures the virtual visit follows the same clinical guidelines as an in-person visit. Expansion of these services creates an opportunity to bring CSH expert care to more children and their families in New Jersey, across the country, and internationally.

Several challenges relate to how caregivers participate in virtual care and the inability to collect essential vital signs, such as blood pressure and weights. CDID is in current discussions with two Fortune Global 500 companies on prospective product development related to both virtual health delivery and solutions to various barriers, including vital signs collection and challenges in the household for care delivery during a telehealth visit.

Augmentative Reality (AR)/Virtual Reality (VR)/Mixed Reality (MR)

Approximate Cost: \$1.5M

AR/VR/MR has started to be utilized in areas that benefit the special needs population, primarily with adults. VR has been used in physical therapy to help individuals with brain injuries ambulate. Top research universities in Washington and Minnesota have used VR to help with chronic pain management. Microsoft has been using AR/MR technology through the HoloLens device to better assist individuals with autism navigate their world.

According to a recent Cisco global survey, **74% of patients prefer virtual access to healthcare services** over in-person interactions with providers.

Augmented reality for special needs learning can be utilized at different speeds and locations. It allows the user to see their environment with virtual objects superimposed upon, or composited with, the real world. This provides the greatest benefit as learners remain part of their surroundings and learn easily. The exponential growth of the use and availability of smartphones and tablets, combined with the decrease in acquisition costs of these devices, make a suitable learning tool for special needs children. These multi-purpose devices, when allowed in educational support will be useful, especially for the development of socialization skills in special needs children.

With the evolution of VR/AR/MR, CDID is on the cutting edge in developing innovative ways this technology can help children with special healthcare needs.



ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING

Artificial Intelligence (AI) refers to the broad idea that machines can execute tasks smartly while Machine Learning (ML) is based on the idea that machines should be able to learn and adapt through experience and algorithms.

CDID AI/ML—A New Company

Approximate Cost: \$1.75M

CDID is actively pursuing AI/ML as a way to enhance the lives of children with special needs and their families. CDID is currently working on a partnership to launch a new company (NEWCO), with an existing AI/ML analytics company who can merge patient data to develop solutions that better address the needs of children with special healthcare needs and their families.

Our vision for NEWCO is exciting and impactful. **With the incorporation of AI/ML, we will pursue projects that have the potential to transform clinical decision-making and care, such as diagnosing autism at an earlier age, predicting a neonatal stroke before it happens, or changing the way people make food choices.** The possibilities are endless and as much of the work utilizes cloud-based platforms, the impacts are geographically limitless.

Behavioral Health

Approximate Cost: \$1.75M

The behavioral health needs of children and young adults in the United States are enormous. ADHD, behavior problems, anxiety, and depression are the most commonly diagnosed mental disorders in children...9.4% of children aged 2-17 years (6.1 million) have an ADHD diagnosis, 4.5 million have a diagnosed behavior problem, 4.4 million have diagnosed anxiety, and 1.9 million have diagnosed depression. Millions of these children don't receive any treatment due to multiple factors, mostly related to access—social determinant challenges like lack of transportation, shortages of practitioners, and traditional models of care that by design can't meet demand, creating long waits for service.

Behavioral health assessments and interventions have predominantly been delivered to patients through in person paradigms. With virtual health technologies, both current telehealth and progressive virtual, augmentative, mixed realities, and incorporation of Bots (automated applications to complete specific tasks), **there are opportunities to dramatically increase access and improve outcomes, not only for our New Jersey children, but for others beyond our borders.**



AUTISM

CSH is one of the largest providers of services for children, teens and families impacted by Autism Spectrum Disorder, serving over 10,000 per year. While our services are broad, there is need and opportunity to further develop those services to ensure each child has optimal quality of life and reaches her or his full potential. Providing virtual developmental and autism screening, autism assessment, autism intervention, and caregiver training/support will improve access for our region and allow us to expand without any geographic boundaries.

CSH RU Cares

Approximate Cost: \$1.75M

The partnership between Rutgers and CSH for the establishment of CSH RUCARES (Children's Specialized Hospital Rutgers University Center for Autism Research, Education and Services) creates a number of opportunities to treat and research autism spectrum disorders throughout the lifespan. Through this CSH Rutgers partnership, CSH will for the first time provide services to a highly underserved subset of children with ASD—those with severe behavior disorders. Not only will these children receive evidence-based care that has extraordinary success rates, they will be followed through the adult based RUCARES center at the Rutgers Brain Health Institute. **There is no other program like this in New Jersey, and one of only a few nationally that addresses ASD across both severity and the lifespan.**

There are opportunities to dramatically increase access and improve outcomes, not only for our New Jersey children, but for others beyond its borders.

Virtual Assessments

Approximate Cost: \$500,000

Improved access of developmental/autism screening translates to earlier identification and linkage to effective intervention, both of which are well established necessities for best outcomes. Once children are identified as at risk or concerns have been noted, the wait for diagnosis must be shortened. CDC data continues to indicate the average time of first parental concern is at age 2, yet the average age of diagnosis is at age 4. This represents lost time in receiving specialized intervention. Virtual autism assessments are not only safer than those completed in person, in this present pandemic, but are feasible and accurate for the present and future.



AUTISM

Virtual Home Services

Approximate Cost: \$350,000

Recognizing that Autism is a spectrum and no single approach works for every child, intervention must include a wide variety of evidence-based approaches. **Expansion of ABA to include a virtual home-based service would expand access to children with ASD.**

Center for Youth Safety

Approximate Cost: \$500,000

ASD often impacts child and family safety with an estimated 40% wandering or eloping from a safe place. ASD is also associated with increased rates of drowning, accident and injury. **We propose creating the Children’s Specialized Hospital Center for Youth Safety with both virtual and in-person components to address all youth with varied special needs and disabilities, across all SES levels.** Virtual streets/sidewalks to promote pedestrian, bike, bus, and driver safety or a virtual house with rooms with common safety hazards to promote home and fire safety, poison control, a virtual pool for water safety, virtual safety education incorporating 911 skills, emergency preparedness, playground safety, teen safety including sex education, alcohol and drug education, cyber safety and anti-bullying, community safety education including CPR training, fall prevention, sports safety, abuse prevention, and safety connections with other agencies and programs can all take place through virtual interventions—augmentative reality, virtual reality, mixed reality technologies. Parts of the in-person path may be located at select places in the environment—playgrounds, parking lots, local streets, etc. This Center will collaborate with schools and child groups to further scale safety in the community.





THE RESEARCH CENTER

Just a few years ago, our leadership team and the hospital Board of Trustees committed to further supporting our mission to be the “preeminent provider” by creating the Children’s Specialized Hospital Research Center. This Center was established to address the paucity of pediatric rehabilitation research that exists nationally and globally. Through our Center we have created platforms for research projects, partnerships, education, training, presentations, and grant support, which have significantly improved the understanding and integration of best practices for the children and families we serve.

The CSH Research Center has been successful in establishing a strong foundation and model, and is now well positioned to be the leader in pediatric rehabilitation research pursuits that further establish evidence based and innovative care. Through this leadership, our CSH brand will become more known nationally and internationally, creating new discoveries that impact care, and generating various opportunities for program growth to service more children who can benefit from our expert care. To build on our success, over the next 3 years there are core programs and relationships that we plan to both initiate and continue.

Recruitment

Approximate Cost: \$3M

A fundamental component to developing an impactful and sustainable research program is ensuring those with high level training and skills are integrated into the broader workforce to initiate and support innovative research projects. Hiring scientists with demonstrated success as a principal investigator (secured grant awards, published peer reviewed manuscripts, presented findings in high level forums) is vital. Support staff that contribute to writing grant applications, promote subject recruitment, conduct statistical analyses, and assist with writing manuscripts are also essential. To pursue such innovative projects we plan to add Research Leads to direct the research agenda within the Developmental Behavioral Pediatrics, Psychiatry, and Behavioral Health sections of CSH. The Research Lead position is fundamentally designed to integrate research with the clinical goals and objectives of our expert teams. These positions, and the related support positions, are innovative at the core, as many research centers, both clinical and academic, often work in less integrated paths with their clinical partners. These positions will be the first of their type at CSH and will serve as a model to expand to other medical and therapy sections over the years. It is within this vision that we can promote and disseminate the innovative work of Children’s Specialized Hospital and lead treatment transformation for our patients, and those with special healthcare needs nationally and globally.



THE RESEARCH CENTER

The Kessler Foundation

Approximate Cost: \$2.1M

In addition to building research staff capacity within Children's Specialized Hospital, we have renewed a 3-year partnership with Kessler Foundation to continue our collaborative work in pediatric rehabilitation research. Through this alliance, we have completed research projects in cognition, mobility, brain injury, autism and chronic health conditions outcomes research, mentored and trained multiple post-doctoral research fellows, received grant awards from local, state and federal sponsors, authored various publications in peer-reviewed journals, and presented at numerous domestic and international conferences. As Kessler Foundation is a world leader in rehabilitation research, we know that more success will follow.

COMPLEX CARE

The Complex Care Program at CSH-RWJBH

Approximate Cost: \$4M

The Complex Care Program (CCP) is a new care model in New Jersey that improves the outcomes and experience of Children with Medical Complexity (CMC), substantially improving quality and lowering the total cost of care. CCP is a partnership between health plans and CSH-RWJBH with shared governance and accountability. Outcomes are achieved by logically intensifying expert clinical services and care coordination in a novel alternative payment model. A highly integrated care team and unparalleled access leads to improved care, better experiences for the patient, family and provider, and a lower total cost of care. These outcomes are realized by reducing unnecessary utilization, care fragmentation, and length of stay.

OTHER CDID PATHS

Biometrics and Medical Technology

Developmental Behavioral Pediatrics Training

Community Recreation

Social Determinants of Health