



2020 Summer Research Internship Program Projects

Below is a list of projects available for the 2020 Summer Research Internship Program at Gillette Children's Specialty Healthcare. The program will start with orientation in June and end with a poster symposium in August.

Carefully review the available projects. Pay special attention to the minimum requirements, which are outlined for each project. Tailor your statement of interest to highlight which projects are of most interest to you and how you are qualified to make a meaningful contribution. As part of the online application process, you will need to rank your project preferences. Efforts will be made to accommodate your choices.

1. VIRTUAL REALITY AS A PAIN AND ANXIETY MANAGEMENT STRATEGY FOR PATIENTS WITH AND WITHOUT DEVELOPMENTAL DISABILITIES

Area: Pain and Comfort

Mentor: Andrew Georgiadis, MD

Number of students: 1 student

Requirements: Undergraduate or graduate student and must be able to commit 20-40 hours per week

Virtual reality (VR) is a new technology being used at Gillette to improve patient experience during medical events. VR provides an engaging form of distraction that may reduce pain and anxiety for some patients. We are measuring the effect of VR in various medical contexts using randomized controlled trials of VR compared to standard of care during a patients' first cast removal. We are seeking one intern tasked to collect survey and heart rate data as well as assist with project implementation. The long-term goal is to better understand how useful VR is for reducing pain and anxiety during cast removal.

2. UNDERSTANDING PAIN AND NOVEL TREATMENT APPROACHES IN CHILDREN WITH CEREBRAL PALSY

Area: Pain and Comfort

Mentor: Chantel Barney, PhD

Number of students: 2 students

Requirements: Undergraduate or graduate student and must be able to commit 20-40 hours per week

Virtual reality (VR) is a new technology being used at Gillette to improve patient experience during medical events. VR provides an engaging form of distraction that may reduce pain and anxiety for some patients. We are conducting an ongoing randomized controlled trial assessing the effectiveness of using VR to manage pain during botulinum toxin injections for children with cerebral palsy (CP). We are seeking two interns to collect video data, saliva samples, and questionnaires in the clinical environment. Interns will also have the opportunity to lead an international survey project assessing pain experience and treatment approaches in children with CP. Interns will assist in screening and recruiting families and emailing survey materials. The long-term goal of this study is to better characterize pain and associated treatments in this vulnerable population across the USA, Canada, and Norway. This pain information will be leveraged to create novel treatment approaches to better meet the needs of children with CP.

3. GILLETTE INTRATHECAL BACLOFEN PUMP REGISTRY COMPILATION AND ANALYSIS

Area: Neuroscience

Mentor: Linda Krach, MD

Number of students: 1 student

Requirements: Undergraduate or graduate student and must be able to commit 20-40 hours per week

Gillette has been implanting intrathecal baclofen (ITB) pumps to treat spasticity and dystonia for many years and has one of the largest populations of individuals with ITB pumps. The aim of this study is to characterize complications in this population at our institution. This involves a need to collect and compile relevant data into a database and to collaborate in analyzing outcomes. This is a retrospective chart review of patients who have allowed their records to be used for research. We are seeking one intern to assist in compiling data from medical records and entering these data into an online database. Along with mentor support, this intern will collaboratively compare and analyze the data to identify changes in practice or outcomes. In addition, this intern will become familiar with the use of ITB pumps for the treatment of spasticity.

4. DYSPHAGIA AND RESPIRATORY FUNCTION IN ADULTS WITH DUCHENNE MUSCULAR DYSTROPHY

Areas: Neuromuscular, Rehabilitation Therapies

Mentors: Michael Peterson, MA CCC-SLP and Jill Gettings, MD

Number of students: 1 student

Requirements: Undergraduate or graduate student and must be able to commit 20-40 hours per week

Duchenne muscular dystrophy (DMD) is a neuromuscular condition that causes progressive muscular weakness across many body systems, including the respiratory system. In later stages of the condition, swallowing muscles are also impacted causing difficulty swallowing (dysphagia). The combination of these processes can lead to the reduced ability to protect the airway from food and liquid entering the lungs, resulting in respiratory infections. Gillette routinely screens for complaints of dysphagia and measures respiratory function for adults with DMD. This study will investigate the longitudinal relationship between complaints of dysphagia, clinical signs and symptoms of dysphagia, and measures of respiratory function. We are seeking one intern to assist in compiling data from the past 4 years of dysphasia screening, pulmonary function tests, and results from dysphagia assessment from a large group of adults with DMD. The intern will also assist in analyzing these data to answer questions about the course of dysphagia, the relationship between screening and clinical diagnosis, and the relationship between screening and respiratory function. The answers may be useful in making screening more efficient for individuals with DMD and to better understand the relationship between respiratory function and complaints of dysphagia. Based on the needs of the Rehabilitation Therapies department, an additional project smaller in scope may be added as appropriate.

5. RESEARCH APPROACHES TO IMPROVE THE CARE AND OUTCOMES OF PEOPLE LIVING WITH SPINA BIFIDA: NATIONAL SPINA BIFIDA REGISTRY

Areas: Nursing, Physical Medicine and Rehabilitation, Urology

Mentor: Rhonda Cady, RN PhD

Number of students: 1 student

Requirements: Upper-class undergraduate (junior or senior standing) or graduate student and must be able to commit to 20-40 hours per week. Experience with statistical and/or data mining methods preferred but not required

The National Spina Bifida Patient Registry (NSBPR) was created to provide a foundation for spina bifida (SB) research with the goal of addressing related physical and mental health issues, encouraging independence, promoting improved quality of life, and achieving successful adult living. Funded by Centers for Disease Control, over 15 sites nationwide contribute longitudinal (up to 5 years) patient outcome data to the NSBPR. Gillette has participated in the NSBPR since 2014. Data collected by the NSBPR is being used to identify healthcare and clinic practices that are associated with the best outcomes for people living with SB, and fuel hypotheses for further research. A protocol for recruitment, enrollment and data collection is in place. Data collection includes patient interview and medical record chart review. We are seeking one intern to assist the research coordinator with both components of data collection and assist investigators in developing new research protocols and analyzing NSBPR data for existing protocols.

6. VALIDITY OF THE GAIT OUTCOMES ASSESSMENT LIST IN PEDIATRIC AND YOUNG ADULT PATIENTS

Area: Gait and Motion Analysis

Mentors: Elizabeth Boyer, PhD and Jean Stout, PT MS

Number of students: 1 student

Requirements: Undergraduate or graduate student and must be able to commit to 20-40 hours per week

The primary purpose of this study is to quantify the concurrent validity of the Gait Outcomes Assessment List (GOAL) and other surveys that measure similar constructs, which are collected as part of standard of care for patients seen in the Center for Gait and Motion Analysis. These surveys include the Pediatric Outcomes Data Collection Instrument (PODCI), Gillette Functional Assessment Questionnaire (FAQ), and Functional Mobility Scale (FMS). The secondary purpose is to quantify the construct validity of individual items on the GOAL with objective three-dimensional kinematics or energy consumption data. A tertiary purpose is to classify the “other” concerns and goals of the patients and determine if consistent themes appear and could inform future versions of the GOAL. We are seeking one intern to help extract the above-mentioned survey data from the medical record of over 400 patients. This intern will also help in performing a literature review and drafting a manuscript for submission to a scientific journal.

7. EFFECTS OF DYSTONIA ON SELECTIVE DORSAL RHIZOTOMY OUTCOMES IN CHILDREN WITH CEREBRAL PALSY

Area: Neurology, Outcomes

Mentors: Elizabeth Boyer, PhD and Angela Sinner, DO

Number of Students: 1

Requirements: Undergraduate or graduate student and must be able to commit to 20-40 hours per week

Selective dorsal rhizotomy (SDR) is a viable treatment option for children with cerebral palsy who have abnormal muscle tone (spasticity). Clinical impression suggests that if a child has a different type of abnormal muscle tone, called dystonia, they may not be a good candidate for a selective dorsal rhizotomy as it may negatively impact outcomes. However, this clinical impression is not universal and there is limited evidence that suggests dystonia may not lead to negative outcomes. The purpose of this study is to determine if the presence and/or severity of dystonia is associated with functional outcomes after SDR in children with cerebral palsy. We are seeking one intern to help extract data related to dystonia and functional outcomes from the medical record. This intern may also help in performing a literature review and drafting a manuscript for submission to a scientific journal.

8. OUTCOMES OF SPINE SPECIFIC EXERCISE PROGRAM FOR ADOLESCENT IDIOPATHIC SCOLIOSIS

Area: Orthopaedics

Mentor: Walter Truong, MD

Number of Students: 1

Requirements: Undergraduate or medical student and must be able to commit to 20-40 hours per week

Adolescent idiopathic scoliosis (AIS) affects about 2% of the population and can cause significant morbidity once severe. The goal of non-operative treatment is to keep curves below 45 degrees for lumbar curves and 50 degrees for thoracic curves to avoid continued progression even after skeletal maturity. Moderate curves between 20 and 45 degrees are at higher risk of progression during rapid growth, and bracing has been proven to be effective at slowing and even stopping progression. Spine Specific Exercises (SSE) have shown some promising short-term results as an adjunct to bracing in children with AIS. Gillette has had an SSE program for over two years with robust clinical and patient reported outcome measures to assess results of treatment. This project looks to compare the short-term results of SSE with bracing to a matched cohort of patients treated with bracing alone. We are seeking one intern to assist with data collection and analysis. Curve progression and pain scores will be the primary outcomes of interest. We hypothesize that those engaged in the SSE program will have equivalent rates of curve progression and decreased rates of pain associated with their condition.