



FACULTY OF MEDICINE

## FoM SUMMER STUDENT RESEARCH PROGRAM EXAMPLE PROJECT SUMMARY REPORT

### Background:

Fundoscopy is a test that physicians use to visualize the back of the eye with an instrument called an ophthalmoscope. The test is an important component of the patient's neurological examination, as it can identify early signs of increased brain pressure and damage to the eye's vital structures. In children, the ability to perform a successful fundoscopic exam is often limited by poor patient cooperation and anxiety around health care providers.

When it is necessary to conduct a fundoscopic examination in an uncooperative patient the alternative options are limited, and include examination under anesthesia or more sophisticated digital cameras. Examination under general anesthetic, however, can be quite invasive and lead to potential adverse effects. While digital cameras have been touted as a safer alternative, such cameras are expensive and virtually cost prohibitive for family practitioners, pediatricians, and other health-care professionals that perform routine fundoscopic exams on children. Such a specialized device would also need to be in place wherever children are examined (every examination room in a clinic, hospital, or other setting), whereas ophthalmoscopes are presently readily available in most clinical settings.

Our research group previously conducted a research study called CAFÉ (cartoon assisted fundoscopic examination) which showed that playing Youtube videos for children 1-8 years of age could dramatically improve the ease and success of fundoscopy in children of this age group. However, this study was performed in a very specific setting (Pediatric Neurosurgical outpatient clinic) and by a single doctor (a Pediatric Neurosurgeon). To see if this simple intervention could be applied to more diverse pediatric situations, we aim to conduct a similar study by involving more practitioners in different clinical settings. We will involve physicians at various levels of training (attending physicians, clinical fellows and residents) from the Emergency Room (ER), Spinal Cord Clinic, and Neurology Clinic at BC Children's Hospital and a General Pediatric Clinic in Vancouver. The Multi-practitioner Ocular Childhood Health Assessment (MOCHA) study aims to confirm the results seen in the CAFÉ study and if the results support our hypothesis, this technique of fundoscopic examination could easily be implemented and applied in physician offices and hospitals with no or very little cost.

### What hypothesis or question(s) does your project aim to address?

Showing a short video clip during a fundoscopic exam will increase the doctor's chances of assessing the health of the eye, and reduce the amount of time needed to perform the exam in children between 1-4 years old.

### Project Overview

For this project, fundoscopic exams were conducted in children 1-4 years of age using Youtube videos as a distraction technique. An iPad (1<sup>st</sup> generation) with a WiFi connection was used to play the videos during the examination. The video was played during only one eye examination, with the other eye examined using the doctor's usual procedure. The order in which the eyes were examined, and whether the video was played for the first or second eye exam, was assigned at random. This was done to minimize any chance of the results being due to bias. These combinations gave us a total of 4 possible examination combinations. Our goal was to recruit 48 patients for each exam combination (12 of each combination for every clinic), for a total of 48 patients per clinic and 196 patients overall.

For each eye exam, we tracked the time needed to conduct the exam, whether the doctor was able to complete the exam, and the doctor/parents' subjective impression of the difficulty of the exam (on a 1-10 scale). The results of each variable were compared between the video and non-video eye exam to determine if a significant difference existed.

For this project, my role included implementing the project at the 4 participating centers (see above), patient consent and recruitment, data entry and analysis, loading and playing the Youtube videos during the examination, instructing physicians on how to conduct the research procedures, and helping prepare a first draft of a manuscript suitable for submission to a medical journal.

### **What are the results of your project and what (potential) impact(s) will they have?**

A total of 100 patients were recruited for our study (56 males, 44 females). Of the 100 patients recruited, 37 were from General Pediatrics, 29 from Neurology, 25 from Spinal Cord Clinic, and 9 from the Emergency Department.

In our preliminary analysis, we found a statistically significant increase in the number of children who had a successful fundoscopic exam when Youtube videos were playing compared to examinations without any videos. Without Youtube videos, we found that the chances of the doctor successfully completing the exam were approximately 65%. However, when Youtube videos were introduced, the odds of successfully completing the examination had increased to 85% - a significant increase when one considers the cost of referring uncooperative children to eye care specialists when fundoscopy is absolutely necessary. Importantly, we also found that both the parents and examining physician noticed a decrease in the level of difficulty of the exam when videos were being played for the children, reflecting the fact that the child was often more cooperative, engaged and relaxed during the examination. The videos also had a positive impact on the amount of time it took the doctor to complete the examination, which decreased from 34 seconds without videos, to 25 seconds with videos.

The preliminary results of this study suggest that Youtube videos can be an inexpensive, yet effective alternative for improving the ease and success of fundoscopic examinations in young children. The potential benefits of this intervention include improving family-centered care through more child-friendly examination techniques, and minimizing the number of unnecessary referrals to eye care specialists when fundoscopic examination is absolutely necessary. The intervention has been so successful that several of the participating physicians in the study have already started adopting the intervention into their practice. Our goal is to continue recruiting patients and to eventually communicate our findings in a high-impact medical journal so that other physicians may adopt our intervention into their practice.