

Final Report IPRO 309
Education and Technical Support of Prosthetics and
Orthotics Education in Latin America

Illinois Institute of Technology

Chicago, IL

April 27, 2007

Instructor

Kevin P. Meade

Team Members

Allison Bagby

Elise French

David Gracia

Peter Maksimowicz

Michael Morley

Christopher Pellico

Vinit Prabhu

Carolanne Rife

Karen Sedacki

Nil Valls

Table of Contents

Introduction.....	3
Background.....	3
Purpose.....	3
Research Methodology.....	4
Assignments.....	4
Obstacles.....	6
Results.....	6
Recommendations.....	7
References.....	8
Acknowledgements.....	9

Introduction

Our objectives for this semester were to continue supporting the first orthotics and prosthetics education program in Bogotá, Colombia that began February 2005 at Centro Don Bosco and to support the new orthotics and prosthetic program at Joliet Junior College that began in January 2007. This project is a continuation of IPRO 309 from the Spring and Fall 2006 semesters. Furthermore, this semester the team revised and added to the websites from previous semesters, to transmit information to teachers and to make the information more accessible. By translating the information to Spanish the information is useful to a wider range of people. Also, this semester's group created additional modules to present at the O & P conference this May in Bogotá, Colombia, and established a firm collaborative relationship with Universidad de los Andes, through a recent alumnus of the fall 2006 IPRO 309, Jared Gardner.

Background

Latin America, like most regions in the world, has many people in need of orthotic and prosthetic care. Different pathologies affect many people. Whether it is a congenital deformity, an injury, or a debilitating disease, it can be a devastating condition and incapacitate a person. In many cases, the patients could benefit greatly from an orthotic or prosthetic device. However, Latin America has a shortage of trained technicians with the skills to fabricate these devices. This problem stems from the fact that the entire region has very few institutions that provide the proper training for prosthetists and orthotists. Latin America is in dire need of accredited orthotic and prosthetic education schools.

Purpose

This IPRO has two main objectives:

Primary Objective

The primary objective of this IPRO is to support the development of the first International Society of Prosthetics and Orthotics (ISPO) accredited Category III program in Latin America.

Secondary Objectives

The secondary objectives are necessary for accomplishing the primary objective. To ensure that the program will be accredited, many guidelines must be followed; these guidelines have set the secondary objectives as follows:

- Develop several educational modules concerning common diseases and their orthotic treatments

- Develop several low-cost demonstrations and hand-outs to compliment the educational modules
- Carefully follow ISPO requirements to ensure accreditation
- Translate all material to Spanish for use in Latin America
- Develop a three day short course to be presented at a Prosthetics and Orthotics conference at Bogotá, Colombia in May 2007
- Work with educators in Colombia to develop a program similar to IPRO 309
- Monitor the use of the previous modules in the new Joliet Junior College Program by soliciting feedback from the faculty member using them

There have been no changes to the objectives throughout the semester. IPRO 309 is an ongoing project in its third semester; because of this the objectives were already well defined. There was no need to change or add any objectives.

Research Methodology

At the beginning of the semester, Prof. Kevin Meade suggested, that this semester we focus on three main pathologies, and their corresponding orthotic and prosthetic treatment. These pathologies were diabetes, cerebral palsy, and osteoporosis. The goal was to make educational modules about each physical problem and its treatment, and deliver them to the O & P program at Centro Don Bosco, as well as making them available to the Joliet Junior College program.

In order to effectively research and compile all of the potential information, the IPRO members divided themselves into sub-teams; one for each pathology. Each sub-team was responsible for all of the materials regarding their respective condition.

With regards to the actual research, each sub-team mainly relied on internet resources. This involved going to trusted websites devoted to education on the particular pathologies and the possible orthotic or prosthetic treatment. Other sources included books and manuals provided by Prof. Meade, as well as the deliverables created by the past IPRO teams.

To ensure progress, the IPRO team decided to schedule bi-weekly updates of their modules. This self-management helped keep everyone on task, and prevent last-minute scrambling at the end of the semester. It was also an opportunity for each sub-team to educate the rest of the group on their topic, as well as receive constructive feedback from the group and Prof. Meade.

Assignments

The IPRO team members all had specific tasks within their sub-teams. There were also administrative tasks assigned to each team member.

The diabetes group consisted of Vint, Michael, Carolanne and Peter. Within the diabetes group, Vinit researched general information on diabetes as well as total contact casts. He also prepared the brochures for the diabetes module. Peter did the initial

research on diabetes orthotics, the condition known as Charcot's Foot, and transtibial prosthetics. Carolanne also did the initial research on diabetes orthotics, as well as rocker sole orthotics. Michael found statistics on diabetes, researched the Charcot's foot orthotic walker (CROW), and translated his sub-team's materials into Spanish.

The osteoporosis group consisted of Allison, David and Karen. Allison researched the orthotic treatment of wrist and hip fractures stemming from osteoporosis. David found the background information on the pathology and translated his sub-team's materials into Spanish. Karen dealt with vertebral compression fractures caused by osteoporosis. She was also in charge of compiling and editing the group video.

The cerebral palsy sub-team includes Chris, Elise and Nil. Chris found the relevant statistics on CP and researched the wrist-hand orthosis (WHO). Elise provided background information about the condition and compiled information about an ankle-foot orthosis (AFO) used for CP cases. Nil researched the Thoracolumbosacral orthosis (TLSO) as well as ways to prevent CP. He also translated his group's materials into Spanish.

The administrative tasks were assigned to make sure the IPRO experience was as smooth as possible. The team had three leaders: an overall Project Manager, an Administrative Manager and a Content Project Manager.

Chris was the Project Manager. He made sure everyone was on task and usually decided the agenda of each meeting.

Vinit was the Administrative Manager. He was responsible to make sure that all the deliverables and IPRO requirements were met by the assigned deadline. He was also in charge making sure that everything went smoothly on IPRO Day.

Elise was the Content Project Manager. She worked with the sub-teams, ensuring that each sub-team was on the right track, providing all of the necessary information.

Carolanne and Karen were in charge of external affairs. They were responsible for getting in touch with some of the support organizations and individuals working with IPRO 309, and letting them know of our progress.

Nil and Peter were the Webmasters. They designed and posted the official IPRO 309 website; the website includes downloadable versions of the IPRO team's materials to make them accessible to both the Centro Don Bosco and JJC programs. Nil translated the website into Spanish.

Nil, David and Michael were the Translators. They translated all of the material to Spanish as well as translated the previous semesters work to Spanish.

Allison was responsible for organizing the trip to Colombia. She kept in contact with the students going on the trip as well as the people in Colombia the students will be staying with.

David was the ISPO Accreditation Expert. David was responsible for reviewing the modules and ensuring that they met the standards set forth by the ISPO accreditation board.

Obstacles

One of the main challenges faced was trying to take all the new information that we learned, and pick out the fundamental topics that were essential for the students in this program to understand. Each sub-team was responsible for a very extensive amount of information; initially the amount of information was a bit intimidating. The extent of research performed by the sub-teams had to be in depth so that each sub-team could have a solid foundation, in a subject matter that they initially knew little or nothing about.

Communication within sub-teams was another challenge. Due to scheduling conflicts and a lack of communication between sub-team members, some deadlines had to be postponed or reevaluated.

An obstacle in the form of a change of scope came up at the beginning of the semester. The aim initially seemed to be more of general overview of the problems of diabetes, cerebral palsy, and osteoporosis, and the orthoses and prostheses which could be used to correct and aide with these pathologies. However, the aim changed from a general overview to focus more on the fabrication of the devices used for each ailment. This was a decision made to better target the students who would be learning from these modules.

Another obstacle that the IPRO 309 team had to get through is one that will always be under debate: the ethics regarding orthotic and prosthetic treatment. The Hippocratic Oath has been taken into great consideration, by not doing any harm, ensuring all information is correct by consulting and checking all information with such trusted websites as American Board for Certification in Orthotics and Prosthetics (ABC) and the International Society for Prosthetics and Orthotics (ISPO), as well as consulting the experts at the Northwestern University Prosthetics and Orthotics Center (NUPOC). Also, no IRB forms were needed because there was no human experimentation, and the information is based on evidence already observed.

Results

The IPRO team made a great deal of progress this semester toward its primary goal of supporting the development of the O & P education program in Colombia. The sub-teams each created an extensive educational module for their assigned pathology: diabetes, cerebral palsy or osteoporosis. These modules included background information on the condition, relevant statistics, as well as the recommended orthotic and prosthetic treatment. The latter point was the focus of each module, since the program in Colombia is dedicated to producing technicians who know how to fabricate the devices. This is why each sub-team made sure to include information on the materials usually used in the fabrication, problematic pressure points between the body and the orthosis or prosthesis, and an overview of the fabrication process. The modules were compiled as PowerPoint presentations. To make the modules accessible to the educators and students in Latin America, all of the information was translated into Spanish, thanks to a bilingual member on each sub-team. Several actual orthotic devices were also ordered by the IPRO team. These will be given to the program at Centro Don Bosco, and will serve as hands-on learning tools.

As was done in previous semesters, each sub-team also created brochures with information from their modules. The brochures were made to serve as a handy tool to educators as well as students, giving a quick overview of relevant topics.

Both the educational modules as well as the brochures from each sub-team were uploaded to the official IPRO 309 website, which was also translated into Spanish. There, they are available for download by the students and teachers at Centro Don Bosco and Joliet Junior College.

All of the educational materials have been compiled together, and will be presented at the four-day conference planned for May of this year in Bogotá, Colombia.

Recommendations

After reviewing the programs that have been developed throughout this IPRO since Spring 2006, and seeing that they have created a great impact in the way of providing educational modules for the intended Orthotic and Prosthetic programs at Centro Don Bosco in Bogotá, Colombia, and at Joliet Junior College, it proves that all of these efforts are very rewarding. A recommendation for the future IPRO teams could be to continue having an IPRO representative in Bogotá, Colombia. This representative, who would have been part of IPRO 309 during a past semester, would provide close contact with Centro Don Bosco and Universidad de los Andes, to ensure that the modules are being well directed to its intended purpose.

Another recommendation is that future IPRO teams ask for feedback from the actual people who will be using the modules. With this feedback, the team members could perform modifications which could improve the program. The feedback could be internal, within the IPRO itself. Each session throughout the semester could be used to provide feedback among the sub-teams, to review the modules and make any necessary modifications.

References

- "American Diabetes Association Home Page." American Diabetes Association. 26 Feb. 2007 <www.diabetes.org>.
- "Charcot Foot." EPodiatry. 2003. 26 Feb. 2007 <www.epodiatry.com/charcot-foot.htm>.
- Cooper C, Atkinson EJ, Jacobsen SJ, O'Fallon WM, Melton LJ 3d. "Population-Based Study of Survival After Osteoporotic Fractures." Am J Epidemiol 1993; 137:1001-5.
- "Custom Footwear: Rocker Bottom Soles." Arizona AFO. 2002. Custom Footwear, Inc. 26 Feb. 2007 <www.customfootwear.com/rocker.html#ROCKER-BOTTOM%20SOLES>.
- "Floor Reaction AFO." Scheckandsiress.com. 27 January 2006. <http://www.scheckandsiress.com/orthotic_care/AFO_Floor_Reaction.pdf>.
- Gavin TM, Patwardhan AV, Meade KP, Pawelczak SB, et al.: "Class II Posterior Shell TLSO Improves Treatment of Thoracolumbar Fractures." Amer Pros Orth News, 5:1-4, 1999. Retrieved from <<http://www.oandp.com/facilities/ia/ampro/spring994.htm>>.
- "A Guide to Bracing for Charcot." 2007. Podiatry Today. 26 Feb. 2007 <www.podiatrytoday.com/article/2694>.
- Kline, Al. "Introduction to Charcot Arthropathy." The Foot Blog. 26 Feb. 2007 <thefootblog.wordpress.com/2006/11/20/introduction-to-charcot-arthropathy/>.
- Madigan, Robert. "Ankle-Foot Orthoses in Spastic Cerebral Palsy." Fillauer.com <http://www.fillauer.com/education/ED_afo.html>.
- Malas B, Meade KP, Patwardhan A, Gavin TM. Orthoses For Spinal Trauma and Postoperative Care. Chapter 9.
- Melton LJ 3d. "Epidemiology of Spinal Osteoporosis." Spine 1997; 22(24 Suppl):2S-11S.
- "National Diabetes Information Clearinghouse." NDIC. NIDDK, NIH. 26 Feb. 2007 <diabetes.niddk.nih.gov/>.
- "Polyethylene Terephthalate." Wikipedia. 19 Apr. 2007. Wikimedia Foundation, Inc. 26 Feb. 2007 <en.wikipedia.org/wiki/Dacron>.

Rockwood CA Jr, Green DP, eds. Fractures. Philadelphia: Lippincott, 1975.
"Serial Casting." Childrensmemorial.org
<http://www.childrensmemorial.org/depts/rehab/Serial_Casting.asp>.
Sinaki M: "Nonpharmacologic Interventions – Exercise, Fall Prevention, and the Role of Physical Medicine." Clin Geriatr Med 19:337-359, 2003.
"WHO: Country and Regional Data." World Health Organization. 26 Feb. 2007
<www.who.int/diabetes/facts/world_figures/en/index3.html>.

Acknowledgements

The members of IPRO 309 also wish to thank:

Bryan Malas (Children's Memorial Hospital)
Jared Gardner (Sister IPRO in Colombia)
Michael Brncick, M.Ed. (Northwestern University)
Mindy Thorpe (Northwestern University)
Patrick Flanagan (Mercy Health System)
Thomas Gavin (Bioconcepts, Inc)
Miguel Gomez (Laboratorio Gilete)