

Stories about the Institute of Biomedical Engineering
University of New Brunswick

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Introduction

The Institute of Biomedical Engineering celebrated its 50th Anniversary in 2015 and a part of the get together was the chance for people to share reminiscences from their connections with the Institute. To expand the number of stories, this project came into being.

The project started by seeking Ethics Approval from the UNB REB and then connecting by e_mail with students, staff, faculty and patients/parents to solicit stories. The stories which follow were received. If you were missed, or simply didn't reply for one reason or another you can still participate by sending your story to Ed Biden at (biden@unb.ca).

Some of the stories are short, some longer. There has been minimal editing and only a few notes have been provided to indicate the time frame of the stories. A few stories were not used if there was a concern about confidentiality.

The Institute of Biomedical Engineering would not have existed without Bob Scott who played a pivotal role as Founder and Director from 1965 to 1990. The event which took things from a small special interest group to the Institute as it exists today was the establishment of the 'Prosthetics Training and Research Units' (PTRU's) in response to the thalidomide tragedy. As Bob described it, he got a call from Ottawa asking if he could work on prosthetics for the children affected by thalidomide. The government would provide funds of \$50,000 a year. This was in the early 1960's when five figure salaries were something to be aspired to. As Bob said, he thought it over for about 5 seconds and said YES.

The section below describing the collaboration is by Sheila Hubbard who was the long time Occupational Therapist involved with children's prosthetics at what began as the Ontario Crippled Childrens' Centre and has transformed multiple times to become Holland Bloorview Kids Rehabilitation Hospital in Toronto.

History of the PRTU's "Prosthetics Research and Training Units" by Sheila Hubbard, Occupational Therapist

Thalidomide Background:

Due to an ineffective screening process, new drug applications were approved allowing a U.S. Company (Merrell) and a Canadian pharmaceutical firm (Horner) to manufacture the thalidomide under license from the original developer in Germany. Thalidomide was marketed in Canada under the trade name Kevadon from April 1961 until March 1962. The drug, given to pregnant women for the treatment of nausea and insomnia, caused severe limb deficiencies and, in many cases, damage to internal organs resulting in gastro-intestinal and genital-urinary problems, hearing loss and heart anomalies. The extent to which the drug damaged the fetus was dependent upon when it was taken during gestation.

In 1963, the Canadian Government's Department of Health, faced with a public outcry due to its approval of clinical trials of the drug Thalidomide and subsequent birth of infants born with multiple congenital anomalies, allocated funds to establish and operate new "Prosthetics Research and Training Centres". These Centres were designated to be located in Montreal- Institut de Rehabilitation de Montreal (RIM), Toronto – the new Ontario Crippled Children's Centre (OCCC) and Winnipeg - Manitoba Rehabilitation Centre and to include the existing Fredericton Myoelectric Research Group located at the University of New Brunswick. Following reports that congenital malformations could be attributed to thalidomide, the drug was taken off the market in West Germany on Nov 27, 1961 and Dec 2, 1961 in the United Kingdom. It continued to be used in Canada until the Canadian Food and Drug Directorate advised it be removed on March 2, 1962.

There were at least 115 Canadians known to have suffered damages due to thalidomide according to statistics reported by the Child and Maternal Health Division of the Department of National Health & Welfare (Nov 1963); more than 8,000 worldwide. The drug was not released for use in the United States.

Funded by a block grant from the Federal Health and Welfare Administration, the core teams consisted of engineers, prosthetists, technologists and support staff. The mandate was to function as a consultant body to the amputee clinics and to design and fabricate suitable hardware for children. A condition of this funding was that the research groups were to collaborate and meet with each other at least once a year.

Key PRTU's personnel:

- Montreal – Dr. Gustav Gingras, Physiatrist (Medical Director);
Dr. Maurice Mongeau, Physiatrist,
Camille Corriveau, Prosthetist;
Andrew Lippay, Electrical Engineer;
Jeanette Hutchinson, Physical & Occupational Therapist
- Toronto – Dr. John Hall, Orthopaedic Surgeon, HSC (Medical Director);
Colin McLaurin, BSc, P.Eng (Project Director) and
Anne Artner (Secretary).
Wm Sauter (Prosthetist) and Carl Linde (Machinist) joined the group in 1964.
- Winnipeg – Dr. B. Tucker, Orthopaedic Surgeon (Medical Director);

James Foort, Chemical Engineer, (Technical Director);
Doug Hobson, Mechanical Engineer

Fredericton – Prof. Robert Scott, BSc, DSc, P Eng (UNB),
Dow Dorcas, Electrical Engineer



Professor R Scott

From 1963-1975, these three centres, together with the Technical Assistance and Research Group for Physical Rehabilitation (TARGPR) Myoelectric Control Research program at UNB, directed by Professor Bob Scott, and the Prosthetic Services of Health & Welfare Canada, worked together, held meetings, and shared information.

Areas of Interest:

- Montreal – use of CO₂ power initially,
myoelectric control (improved USSR limb,
1965 - contracted Northern Electric to miniaturize their myoelectric
prosthesis, 1967 – development of the Northern Electric hand for
children)
- Toronto – powered prosthetic components,
specialized lower limb fittings and components,
training of prosthetists & orthotists
- Winnipeg – lower extremity prosthetics,
collaborated with UNB on development of implantable myotelemetry
systems
- Fredericton – myoelectric control systems for application in prosthetics

Photos from PTRU's



Cam Corriveau, Montreal



John Hall FRCS (C)



Colin McLaurin B.Sc.P.Eng



William Sauter Prosthetist

Some of the other members of the group.

The Committee for Prosthetic Research and Development (CPRD) of the US National Academy of Sciences/National Research Council played a major role in facilitating international collaboration and organized/funded several international conferences and special meetings. Colin McLaurin served as chairman from 1969-1975.

This was a unique time in the history of children's prosthetics. No one had ever encountered birth defects of this magnitude and innovative approaches were required. Throughout the twelve years of operation, the four groups worked collaboratively to try to address the needs of these exceptional children. Although many ended up preferring to use their own phocomelic limbs or adaptive equipment in preference to these early experimental fittings, the pioneering efforts did influence the development of improved prosthetics and orthotics worldwide.

Reflections from early days by Eric Gozna, Orthopaedic Surgeon

Eric Gozna P Eng, MD,FRCS (Orthopedics) was an Orthopaedic Surgeon in Fredericton (retired and sadly passed away in 2021) and had a very long standing connection to Bob Scott and the Institute. Eric's reflections take us back to the early days of the Institute in the 1960's.

Recollections of the UNB Biomedical Engineering Institute

My earliest recollection of the Biomedical Institute was that there was none! There was just Bob Scott and 2 -3 determined graduate students (one of whom was Phil Parker) sitting at work benches in a small lab in one of the corners of the electrical engineering department. One would see Bob at all hours of the day and night bent over a bakelite circuit board, switching resistors, capacitors and transistors in and out...his progress being monitored by the lines on a green dimly lit glass-tube cathode ray tube. Professor Scott taught transistor theory (a new subject then) and when not lecturing he could always be found assembling his circuit boards. It seemed to me that the devices created were based more on trial and error than precise science...requiring a talent that fell somewhere between that of mysticism and engineering. I would not have been surprised to see him in a cloak and peaked sorcerer's cap.

It was 1966, and I was a struggling senior electrical engineering student, desperately in need of a faculty member to serve as my thesis supervisor. I had recently read an article in the IEEE Journal comparing the squid nerve axon to a PNP transistor and was enthralled with the concept, as it compared a biological and nonbiological system. As Professor Scott was our resident transistor guru I approached him (as he was bent over a circuit board) ... and to my great

joy he took me on. It was about that time he and his small team became involved in designing, building and refining myoelectric control systems for upper extremity amputees. These were sponsored by War Amps and fitted in an upper extremity amputee clinic in Ottawa.

Upon graduation in Electrical Engineering, I was accepted in a Master's program in Biomedical Engineering at the Technical University of Nova Scotia (TUNS) in Halifax. I always suspected that working quietly from his small lab at UNB Prof. Scott had opened this gateway to my future, which subsequently allowed my acceptance to Dalhousie University Medical School and ultimately the University of Toronto Orthopedic Surgery program.

My wife, Ellen, and I always wanted to return to the Maritimes. And to our delight I was offered a practice opportunity in Fredericton; with a new modern hospital, a strong Orthopedic Surgery department, and the opportunity to re-establish my relationship with Bob Scott and the institute. The decision was a "no brainer".

To my surprise in the interval since I was last in Fredericton the Institute had developed an international reputation; with full time staff, researchers and graduate students. Although designing and manufacturing control systems, they had no local facility for fitting prostheses. Therefore shortly after Bob and I reconnected, he suggested that establishing such a facility; to provide service to Maritime upper extremity amputees and to allow our researchers the opportunity to witness first hand the results of their efforts. So with the sponsorship of UNB and War Amps of Canada the UNB Myoelectric Electric Clinic was established at the Stan Cassidy Rehabilitation Center.

Though my role was minor (I merely signed the prescriptions) it was a great thrill to witness the Institute and fitting facility expand. Though I'm no longer involved, I'm immensely proud of what the Institute has accomplished.

I feel this came about principally because of the determination of one man, who surrounded himself with like-minded individuals who never lost sight of their goal of excellence. It can safely be said that the UNB Biomedical Institute has always "punched way about its weight!".

The Phys Ed Connection

Some of the earliest activities of the Institute involved Bob Scott and Barry Thompson. Barry was a Professor in Physical Education. In the course of finding these stories Jim Morell, a member of the Phys Ed Class of 1967, challenged his class mates to contribute their stories.

From Jim Morell:

Good evening fellow PE'67 classmates....

A few days ago I was speaking with a Fredericton friend, Ed Biden, who is a retired member of the engineering faculty and who was active in UNB's Bioengineering Research Institute. He is writing a history of the Institute, which is one of UNB's huge success stories. This Institute is known world-wide for its ground-breaking research and its work in helping create prosthetic limbs for limb-disabled people. I was telling him that, with encouragement from Prof. Barry Thompson, many members of our class agreed voluntarily to having an electrical receptor inserted in one of our biceps in order to help Dr. Bob Scott (founder of the Institute) determine if it would stay in one place for a certain length of time, even given our regular and often rigorous exercise routine. Ed was unaware of this contribution by PE students to the experiments that took place in the early years, but was intrigued with my 'story'.

He asked me a few questions about my own experience in that experiment but I had very few memories of it. We both wondered if other members of the class might have memories that would be of interest. My assumption is that this was a guys-only volunteering project so I agreed to ask my fellow (male) class members that very question. **So through this email I am asking you if you volunteered to have the electrical receptor inserted and what you remember about that experience.** Please don't feel constrained by these questions, but they might trigger your thoughts What year was it - 2nd, 3rd or 4th? What did they tell us prior to volunteering? Who did the inserts and where did that take place? For how long were the inserts left in our arms? What effect did it have on you, if any? When were they removed? How did you feel about contributing to the research? etc etc

I'm hoping I receive lots of memories.

Brian Connell:

I have quite vivid memories of the Bioengineering prosthetic limb research project:

When: As I was not with our class until 3rd year I am quite comfortable in saying our class involvement was 1966 our 3rd year.

Background I recall that Andrea Campbell, Suzanne Dudley (Gord's wife), and Betty Neilson (at the time and now deceased) worked on the project for Bob Scott (BRI Director) and that Barry Thompson recruited the volunteers.

My Story: Like others I had at least one (perhaps others) receptor (wire) inserted into my arm just over my bicep muscle. On several occasions I visited the lab and the end of the wire was connected to an oscilloscope and I was asked to attempt to control the scope image by initiating a muscle contraction. I found the experience to be both interesting and personally satisfying in terms of contributing to science. However the experience was not without a degree of adventure. On one visit to the lab when the covering over the wire was removed the wire was missing. Did it fall out or had it become raveled in a bicep fiber and drawn in? That was the question. So Bob Scott contacted Barry Thompson who, ever so caringly, made arrangements with Dr. Gerry Clayden at the old VPH to X-ray my arm and there it was. To this day that tiny wire remains (I assume) embedded in my left bicep muscle.

An interesting side note is that I Gerry Clayden and I became good friends as a result of my relationship with Elaine who worked in the radiology department and coincidentally many years later Bob Scott and I simultaneously sat on the Canadian Standards Association, board of directors.

Paul LeBlanc:

[As with any real experiment, the results are not always what you hoped for] What I remember is that it did not work. Some of electrodes came out only in part, some were all zig zag in shape and many like mine never came out at all

Barrie MacGregor:

What year was it - 2nd, 3rd or 4th? ***I think it was third year.*** What did they tell us prior to volunteering? ***I don't remember what we were told, just that Barry Thompson asked for volunteers and that was enough.*** Who did the inserts and where did that take place? ***The inserts were done by a couple of wives of other PE students.*** For how long were the inserts left in our arms? ***Don't know.*** What effect did it have on you, if any? ***None that I remember.*** When were they removed? ***Don't know.*** How did you feel about contributing to the research? ***It was a small thing to do and helped out in some research. The work was done in a building on the road to the airport. Might have been a government building of some sort.***

Ken McAuslan:

Yes, I was one of those who participated in the study but like you, time unfortunately dims the memory. Nonetheless my clear recollection is that the project was prompted by the tragic Thalidomide situation, a drug never approved in the U.S. but originally introduced in Europe as an over the counter medication for morning sickness. In Canada it was approved in 1961 AFTER being withdrawn from use in West Germany, its country of origin. Although only available here for 3 months before being withdrawn in 1962, over 100 Canadian children were born with limb defects not to mention thousands around the world.

The object of the study was to determine how truncated muscular and nervous systems could be connected to prosthetic limbs - in our case arms. I'm going to guess this was in our 3rd year when affected children overseas would have been some 8 years old with lifetimes of tragedy ahead of them. I can't remember the details of when, what or how our study was conducted, however as you suggested we were chosen because we were the most active people on campus and would the electrical receptors become dislodged as a result. Regarding our efforts in the lab itself (where I can't remember) I only recall that we had to keep a small dot close to a median line on a screen and it was a devil of a thing to do. Nevertheless with time and practice we gradually improved - I recall that due to our competitive natures it became a question of who could do it best. That's about all I remember but I hope our collective efforts may have helped make a life change for some.

Prosthetics Controls

Spending Time with Bob Scott by Ed Biden, Former Director, Professor of Mechanical Engineering

When I first joined UNB in 1987 I often stopped in on Bob Scott. Whether I was wasting his time I'm not sure, but he told me many tales about the Institute

Bob got drawn into this area when the Forest Hill Rehab Centre (Later the Stan Cassidy Centre for Rehabilitation) approached UNB looking for some help in modifying a wheel chair so that the user could reach the joystick control. Bob described the situation when he and a couple of colleagues went to scope out the problem. Not being able to reach the joystick control meant that to be mobile someone needed to walk along side and "drive" the chair.

Bob, Barry Thompson of Kinesiology and Bill Kinghorn from Mechanical Engineering bent some conduit, applied some hose clamps, moved some wires and the chair went from being a frustration to a mobility aid that allowed its user to give tours of the rehab centre. Bob said to me that in many ways it may have been his most successful project.

Bob and Barry continued to work together and were particularly interested in harnessing muscle activity, as measured using EMG, as a control input. That work became formalized through the PTRU's described above and the whole area of prosthetic control has remained a core element of the Institute.

Kevin Englehart Graduate Student, Staff Engineer, Faculty Member Electrical Engineering

A few of the memories which came to me were at about the middle of my career, but I shouldn't say middle because I don't know where the end will be. They are memories of successes and I'll just describe them as what they meant to me personally.

I came to the Institute from a year in industry and a classical engineering background, I was very driven to see that work I was doing had an impact. I found great enthusiasm in being involved in projects that had a lot of impact.

I think you'll remember the CRD project that we had with Hugh Steeper and Liberating Technologies which was probably Liberty Mutual back then. It was the big project at the time and I think it was very much mainstream research and actually developing the pattern recognition control system. I found a lot of reward in that. Also I could piggyback off of it to complete my PhD thesis which was great as well.

The humorous story that happened as a consequence of that experience was when you, Bernie and I went to visit Steeper's (Hugh Steeper Ltd a prosthetics manufacturer in the UK). We had some really interesting exchanges with the group over there. I think they were kind of mystified as to what this whole thing was and you'll probably remember some of the conversations better than myself. We met Paul Steeper while we were there and Robin Cooper

was our host. Just being around those folks was interesting. I don't think they really understood what we were developing until we actually showed them and I remember Paul being quite enthused.

The day before we were to do a demo we tried it out in the hotel and the thing went up in a little puff of smoke. I think we tried to go get some parts or something from a local Radio Shack to fix it. Anyway, we got it going again but when we went to demo it the next day I think the elbow and wrist activated simultaneously when there was no intention to do anything of the sort. They thought that we developed a simultaneous control system for pattern recognition and were over the moon about that. I think we told them the truth eventually. That was a kind of premature launch of pattern recognition in prosthetics.

In subsequent years as we continued to plug away at the algorithm side and it was actually when we started to do research with the Rehab Institute of Chicago (RIC). I remember Todd Kuiken convincing me that muscle reinnervation and pattern recognition were a kind of killer application and he turned out to be right.

There were a couple of moments which were really significant. I think, for me, the most significant was when we were actually able to start fitting these systems on patients down at RIC. They had the resources to do it and their Occupational Therapist, Kathy Stubblefield used it for the first time. I expected this to be an Occupational Therapist kind of shaking her head at an engineering idea, but she was quite taken by it. For me, and by extension Bernie and all the others who had worked on pattern recognition over the years, and didn't know if it would be accepted, that was a huge hurdle to have a clinical professional actually say that this is a fantastic new tool. So having Kathy's endorsement was huge and I think that led to a series of other milestones like getting the DARPA contract that allowed us to propel it even further and then having someone like the first patient fitted with a pattern recognition prosthesis: I still remember his quote, I still use it when I give talks: "I don't know how to learn how to use the system it learns how to use me". He got it exactly right and it helped if you had a Tennessee drawl as well. Then, you know, that gave the work a little bit more inertia to the point where two students of ours, Levi Hargrove and Blair Locke, actually had the initiative and the where

with all to do the work to develop the business case. They actually had a Company formed which has subsequently been successful in selling pattern recognition based control systems. I think it was more than we could ever hope for after all the work in the area. They are gracious enough to still give us all the credit in the world for training them and developing the initial prototypes and algorithms that are used in their system.

So those are personal milestones; but I think a lot of people share those as well and I think it speaks, in a significant way, to the way in which the Institute has had impact both directly in terms of technology and the clinical knowledge transfer. Add to this the fact that it's created connections to the Institute either by knowing where this technology came from or by people at MEC coming back and using some of the words from pattern recognition as if they're common phrases now.

Second Story:

I'll mention too the one you may already have: When we were having tough times at the Institute in the 1990's I don't think anyone who was there doesn't remember the party line system that we had. Sharing phones and things like that ... it was tough at the time but I think it was a was a pretty special memory for us too.

International Development and Cuba: Ed Biden, Former Director, Professor of Mechanical Engineering

In 1995 CIDA (Canadian International Development Agency) launched a program called UPCD (University Partnerships in Cooperation and Development) which was designed to fund links between Canadian Universities and Universities in the developing world. As it happened Christiane Paponet Cantat, who was a Professor in Anthropology, was leading a group of UNB academics and administrators on a tour of Cuban Universities. At Santa Clara (Universidad Central de Las Villas) Frank Wilson, then VP of Research and International Cooperation, was approached by Juan Lorenzo Ginori who was head of their Biomedical Engineering Research group wondering if UNB was active in Biomedical Engineering and would they be interested in

collaborating on a UPCD proposal. Frank said “Yes” and on his return called Ed Biden who was Director of Biomed Engineering and said “...these are good people! Make it happen!”

Writing the proposal is a story in itself. Email was unreliable, the Internet was very slow and phone calls from Cuba were limited to 3 minutes with an operator to enforce the time. Through all these challenges a letter of intent was crafted and was successful. The Cuban team came to Canada to write the proposal (arriving in a late spring snowstorm) and the project became the first of three CIDA sponsored initiatives.

These next stories are from Carlos Novo who was one of the Cuban team members who came to Canada.

[A First Story written by Carlos Novo, Universidad Oriente, Santiago de Cuba:](#)

Dear Ed,

Thank you very much for the chance to participate in project. I tried to produce a recording but didn't have a microphone. Tried Laptop and am now trying with my cel phone.

Writing the history of the IBME of UNB and all the Cubans who have been part of it is a lot of history.

Personally, I need to say my first contact was around 2004 which was the first time the Bio-physics Centre was in contact with UNB.

I was the first Cuban from Santiago and everything was on me. It was very hard for me that visit. I was very young. But it was OK due to previous experience I had had in Poland when studying there but it was very different.

I remember the first visit to UNB

I arrived at the Toronto airport and had, in hand, a map of the airport and was studying how to get through the airport and change terminals. I was told how to change terminals using the Shuttle bus. Finally there were some Cuban friends who were waiting for me. This helped.

When I arrived in Fredericton the first impression in my mind from the airplane was you were there waiting for me. I had a picture before I arrived. It had been hard to get because we didn't have wide band internet and it was very hard to access a picture from Santiago.

I walked from the airplane to the terminal and you were in the window. It was very emotional to see someone waiting for me. There was just Ed waiting for me. You gave a strong hug, asked me about the trip and invited me to your car where you had different winter clothes; coat, hat, scarves, to provide to me.

It was my first time visiting a huge country like Canada. Details stayed in mind for a long time.

This is my first history story about the institute.

A Second Story written by Carlos Novo, Universidad Oriente, Santiago de Cuba:

In 2004 you were the Director of the Institute. (Actually Bernie Hudgins had become Director in 2000) After you picked me up from the Fredericton Airport Terminal that night you drove me to Magee House. We entered by the main entrance to the University and you showed the facilities inside the campus. We were driving up the hill and passing the Institute. You told me, this is where you will be working. That was my first contact.

Some things I remember very clearly. This is like a picture in my mind. When we arrived at Magee house, you helped with luggage to the apartment. You told me it was an apartment shared with earlier Cubans. Actually, there were a lot of things from people from Via Clara especially Eduardo.

You showed me the kitchen. There was bread and milk to get breakfast and you said we will be in touch tomorrow.

It was not my first time with snow because I had been in Poland. It was typical winter time.

Next day we had a meeting at IBME. I remember walking to the IBME and entering. An instant contact was with Angela. She gave me a welcome like my sister or mother or another Cuban. We had a good sympathy.

Oh my goodness, it was hard with language and English. Hard to say thank you and share emotion in some way but that is part of the normal emotional response of meeting someone for the first time. It was not very pleasant for me with everything in English.

I received a warm welcome. It was good behavior, almost karma. Not just from Angela but from the others waiting for me. Kristel was also waiting and Walter. I don't remember all the people who gave me a welcome. Walter was always around.

This was my first contact in 2004.

A Third Story written by Carlos Novo, Universidad Oriente, Santiago de Cuba:

Previously I forgot to mention that in 2004 I was part of the second project under UPCD (University Projects in Cooperation and Development) which was sponsored by CIDA (Canadian International Development Agency). The Canadian part included IBME at UNB and also the Hospital for Sick Children in Toronto. The Cuban partners were CEETE at Universidad Marta Abreau in Santa Clara and CUJAE in Havana plus CBM at Universidad Oriente in Santiago.

It was hard to be the first Cuban from Santiago. Villa Clara had been involved with IBME and the EE faculty at UNB on a project before the one which included Santiago. I remember that it was a 3 month visit and I had serious problems with my English.

I tried to collect as much information as possible. I was enjoying the Internet and the “splendid speed” of the connection. A large amount of literature was available. I was accessing journals which were a priority for us in Cuba. I was looking for the main journals especially in biomedical engineering and biomechanics topics.

I remember the big printer in the Institute. I printed a lot of journals. There were facilities with lots of books and journals and I collected copies and electronic ones as much as possible. Today I am still using some of the classic works which were collected then. At that time there were good facilities at UNB and the Internet was just coming to Cuba.

Another thing about the Institute was a point that almost all the professor’s offices were open all the time. It was new to have open doors. Students working after hours had all the facilities plus a key to the main entrance. I could go there and enjoy facilities at any time which was very useful.

The prosthetics lab access was limited but most other things were open.

I enjoyed the kitchen. I realized it was for use of people practicing with new artificial limbs. It was good to allow anyone to use the kitchen. I saw that the kitchen area was for kids

to learn skills. In the room next door was a pool table. It was nice to see professors and students use the pool table. It was a good chance to share.

In 2014, when I came the second time, there was no pool table. It was eliminated.

The other thing, most important, was that all professors, no matter what level, were completely accessible to everyone. You could meet someone and ask a question. They were very accessible. Prior to Canada when I was in Poland it was completely different. You had to make appointment. Students could not interrupt a professor in hallway. This was amazing for me.

You introduced me to Kristel who was always accessible to us. She was always solving problems and was always looking for a solution no matter how complex the problem.

Also, I need to refer to making time for meetings. No matter the simplicity you tried to be connect to the idea and to help us. You never imposed any ideas but you were always available for our needs, ideas, and objectives. You were trying to develop biomechanics but also solve needs in Cuban universities. You were trying to give us the seed initial impulse.

We got a lot of help from Angela and Walter. Everybody, when I looked for help, they were open to me.

I need to mention with Prof Peter. He was hard to connect with due to my language skills. It took some time for me to get his accent but he was a person who was very open . He has a special sympathy with the Cuban students and people which we appreciated.

[A Fourth Story written by Carlos Novo, Universidad Oriente, Santiago de Cuba:](#)

Universidad Oriente, Santiago Cuba

The main object of the program in 2004 was to develop Master's and PhD programs in biomedical engineering in Cuba and to improve qualifications of the professors, and also to contribute to links between Cuba and IBME.

- To improve and develop the biomedical engineering programs in the three Cuban universities
- To create three laboratory facilities for biomedical research and to improve equipment
- Linking to provide scientific and medical information for professors and students

These were the main objectives. They were working effectively in my view.

In 2014 we continued with these objectives. I was there in the Mech Engg PhD program.

From my personal point of view we never had a biomechanics program in any university in Cuba at any level of the system. There were a few projects directed at medical science or for sports science but no specific projects in technical sciences.

We have to remember as part of the CIDA Tier 2 program Cuba was building, with help from UNB, the staff for openings in biomedical careers. That was a very important outcome of the project.

Due to specific things done by IBME, today have biomedical careers in Oriente.

I Have to say at that time there were starting 3 centres (Havana, Santa Clara and Santiago de Cuba) for biomedical engineering education. Only Havana and Santiago are still running. We should say that the two programs are running. I have been visiting CUJAE and have links to their professors. I know the staff. They are very young and don't have the depth of Oriente (Santiago). It is interesting to say in Oriente there was concentrated the groups in biomedical engineering.

We have been keeping the relationships with IBME and are in a good position. In 2004 I was invited by mechanical faculty but was full time at IBME. This was a continuation of the direction of the CIDA program. The objective was to establish lab facilities in the hospital and transfer knowledge and skills in a practical way to the hospital to complement the clinical process.

Study was of neuro disease and movement disorders through Biomed, kinetic, and kinematic, information. First objective was for transfer of low cost technology to the hospital. Luckily for the hospital contribution, the Hospital Director was connected with us. Also, Dr. Carlos Cabal was Director of the Biophysics Centre. The hospital opened the doors to us. We transferred the lab equipment.

As part of our project there were a few objectives:

1. Part of our duty as PhD students was first research and tech transfer to the hospital. We were developing a lab and working with new technology. The UNB Currie Center had the most advance facilities in Canada. As a student I got to help with setting up new technology. We were trying to learn everything.
2. Combined with our duty as students and combining with the Institute were developing different experiments and projects and preparing for transfer of technology to the hospital.

Due to immigration issues It was impossible to make the final presentation of my thesis. We tried different ways to solve the problem but the formal requirement was not completed and had to come back and present my thesis in Cuba. This was the only thing not presented.

The objective of projects were finished and today we are here and we can help the country and the national health minister to recognize us as the only group which works in biomechanics and a few processes and technologies in the study of human movement. I have been collaborating outside Cuba with Columbia and with CUJAE in Havana.

One of the projects was with the national Rehab Centre in Havana, which is among the biggest hospitals in Havana.

Another objective is to transfer a research lab to study rehab processes for children with cerebral palsy. One of my own supervisors was Dr. Vickey Chester who was working with CP

patients. I wasn't working directly with these patients but was connected for the methods and am helping colleagues in Havana.

At some point during conferences I always mention the contribution of IBME and UNB.

We have made a contribution to the country.

International Development Activity in Cuba by Kristel Desjardins, Project Manager

My story is going to be about the 90's in the Institute.

The 90's saw financially turbulent times and in 1995 we were fortunate to be approached to submit a Grant application to CIDA (Canadian International Development Agency) with a group in Cuba. We had our first Cuban visitor in 1995. He was the director of a research institute similar in size to us in Santa Clara. He and a colleague, travelled to Fredericton and Ed and the two gentlemen wrote the Grant application which was awarded. Our project launched in 1996. We continued to work on CIDA projects with the group in Cuba until 2013. This involved different capacities on three different projects but I truly believe that this partnership was not only beneficial to our group as a whole.

The group ended up being three groups in Cuba at three different universities. I think internally it united our little group here in the nineties. The Institute was much smaller, the building was much smaller, the group was smaller and it was a very different feel than it currently is. The building is twice as large with another addition being built. It was also that we didn't have access to a lot of the grants and contracts that we do now. I feel that taking the chance and jumping at this opportunity and some other opportunities in the nineties saved the Institute. We had had some dire years financially and taking a risk on unknown Project funding through CIDA enabled us to carry on, keep people employed, and gave people an opportunity to experience working in International Development. This broadened our reach, even on campus, we made friends in different departments especially a woman in anthropology who at the time was the ILO the (International Liaison Officer for the University).

Atlantic Regional Training Centre: Health Services Research, By Ed Biden Former Director

In the late 1990's there was a perceived need for more capacity in Health Services Research within the Canadian Health Care System. The Federal Government was lobbied to provide funding for the development of training programs in Health Services Research and stemming from this, the Canadian Health Services Research Foundation was formed. Among the programs the Foundation launched was a call for proposals for Regional Training Centres to train students in qualitative and quantitative research skills. UNB was part of a consortium of UNB, Dalhousie, and Memorial Universities (later expanded to include UPEI) which proposed, successfully, the development of a degree program in Applied Health Services Research. The program was designed within the Arts Faculty but eventually moved to Interdisciplinary Studies and for many years found a physical home in the Institute of Biomedical Engineering.

Applied Health Services Research by Roger Chafe PhD Student and now faculty member at MUN Medicine

In 2002, the Institute of Biomedical Engineering helped establish the Atlantic Regional Training Center (ARTC) program. The ARTC created a training program in health services and health policy research serving the four Atlantic Canadian provinces. The original universities involved were Memorial University of Newfoundland, Dalhousie University, the University of Prince Edward Island, and the University of New Brunswick (UNB). The Institute for Biomedical Engineering served as the home for the program at UNB.

In the second year of the new ARTC program, Roger Chafe began as one of the program's first PhD students. His thesis committee consisted of Drs. Doreen Neville (Memorial), Thomas Rathwell (Dalhousie) and Ed Biden (UNB). His thesis project was based on in-depth case studies on how health care resources are allocated around different technologies. The first technology chosen was endovascular coiling, which is a technique for treating neural

aneurysms. This was a topic of interest to policy makers at the time as there were funding issues being discussed regularly in the media. Because of its high profile, he also looked at MRI machines, the funding for which was an issue facing all provinces. As a way of bringing in a biomedical aspect to the project, he also identified the funding of upper arm prosthetics as the third case study. This allowed for the Institute of Biomedical Engineering to expand its work in looking at the policies around the funding and the adoption of new biomedical technologies. To give a national scope to the project, Roger looked at these funding decisions in three different provinces: Newfoundland and Labrador, Saskatchewan and Alberta.

For the study of funding decisions for prosthetics, Roger interviewed users of the prosthetic devices, and relevant decision makers in the provincial governments, regional health authorities, and the managers of prosthetics programs in all three provinces. One of the interesting findings was the variation in coverage for upper arm prosthetics at the time. In Newfoundland, while there was no public coverage for most prosthetic limbs, upper arm prosthetics were mostly covered by applications to the War Amps charity. In this way, most patients did not feel the effects of not being covered because the charity was stepping in. In Saskatchewan, given its history as one of the driving forces behind our universal health care system, there was universal public coverage for upper arm prosthetics. That meant that like any other insured medical service, patients in Saskatchewan who needed upper arm prosthetics would have their prosthesis totally covered by their provincial government. In Alberta, there was no coverage and there was no regular appeal charity. Rather families were expected to pay the full cost of their prosthetic limbs out of pocket if they did not have private insurance.

The involvement of the Institute of Biomedical Engineering in the ARTC Program emphasizes the role that policy plays in the ultimate adoption of new technologies. It is not just that the technology gets developed but that there is a whole host of considerations that weigh into decisions around whether a new device gets used or not by patients. Being involved in the ARTC program allowed further exploration of both the factors that influence the funding and the different methods of funding new biomedical technologies developed by the Institute.

Roger completed his PhD thesis, which served as the basis for his book *Allocating Healthcare Resources in Canada - Comparison of Nine Case Studies*. After the ARTC program and his involvement with the Institute of Biomedical Engineering, Roger continued on to complete a post-doctoral fellowship at the University of Toronto and now is an Associate Professor of Pediatrics at Memorial University of Newfoundland.

Applied Health Services Research: Lilian Kabukour Manor MAHSR Student 2014

IBME was home away from home to me during my stay in Canada (August 2012 to July 2014). The staff and students were very affable which made life a lot easier for me as an international student from Ghana.

In fact, I joined IBME with a Biological Science background which was a huge challenge for me at the start of my masters program but what made a difference to my success story was the fact that I had a supervisor who believed in my capabilities much more than I foresaw in myself. In my opinion, IBME is indeed a great family which every student will desire to be associated with. There is one key thing I learnt and will always hold dear, I admired in my supervisor his “leadership with humility” qualities.

Lest I forget, I really miss those famous potluck parties. It was a wonderful experience!

On this note, I would like to take the opportunity to say a big thank you to Dr. Ed Biden and the entire IBME team. Keep up the good work.

Royal Visits:

The Queen, Princess Anne and Prince Charles have all visited the Institute as part of Royal Visits to New Brunswick and UNB. For the visit by Prince Charles, Bob Caldwell who was manager of the Prosthetics Centre and Ed Biden as Director were asked if they could come out on a Sunday to meet the advance team who were going over the route for the Royal Visit. They

arrived a little early and soon after an RCMP Officer pulled up. They were showing him the building and things seemed pretty straightforward when all of a sudden a tour bus pulled up out front and 28 people got off. Suddenly the lone Officer was doing a lot of saluting. The advance team included representatives of the Prince, the RCMP, Foreign Affairs, the Province of NB and so forth.

Personal Reflections on Royal Visits: Angela Hamilton retired Secretary at IBME

I can genuinely say that during my time at the Institute (1983-2016), my favourite memories and events are the “Royal Visits”. (There is a Scrap Book in the admin office that I compiled over the years.)

1984

Her Majesty Queen Elizabeth II and the Duke of Edinburgh, Prince Philip, visited the City of Fredericton on Tuesday, September 25, 1984. Their visit to the capital city was an all-day event to celebrate the provincial bicentennial and included a trip to the University of New Brunswick's Fredericton campus. Upon their arrival, they were greeted by UNB President James Downey and Mrs. Downey and later served lunch at McConnell Hall. During the luncheon, Premier Richard B. Hatfield presented the speaker of the Legislative Assembly and other guests. The Royal Anthem was played by the New Brunswick String Quartet and Archbishop Nutter said grace. After dessert Premier Hatfield proposed the Royal Toast. The Royal couple left UNB at 2:50 by car.

(Lousie Bolden, Virginia McDougall, John Hayden and I walked to McConnell Hall for photos)

1986

Princess Anne visits the Institute of Biomedical Engineering, Thursday, June 26, 1986. Patient, Sara Kerr, presented her with a bouquet of flowers. (I arranged the purchase of the bouquet with my previous employer, Currie's Flower Shop). Princess Anne signed our guest book (Prince Charles would eventually sign as well).

1996

Saturday, April 27, 1996

“From CBC...Prince Charles meets some scientists and patients (Justin Belliveau of Dieppe, NB and Harold Williston of Bible Hill, NS) at a biomedical lab that develops technology for artificial limbs”. Prince Charles signed our guest book next to the same page his Sister, Princess Anne had signed in 1986...his comment...“Oh...she’s already been” (I always remember this comment!)

(All employees in attendance celebrated with a “Royal Supper” at Dolan’s Pub. I remember a lot of security leading up to this visit. My contact for security was a member of the St. Stephen RCMP detachment)

All the best. At this age...glad my memory is serving me well!

Angela

Personal Reflections, Nancy Black, PhD Student (2001), now Professor at University de Moncton

- 1) In spring 1996 – I was amongst the students welcoming Prince Charles when he visited the IBME. We were several people lined up in the main floor hallway of what was then main entrance (the red-brick building). As he passed us, he stopped and shook my hand and asked if my office was on that main level. ‘No’ I replied... it was in the basement. He asked if it was a nice space. ‘Yes’ I lied – thinking of the basement room barely tall enough to walk below the pipes.
- 2) In June 1998: The Princess Royal, Princess Anne visited Fredericton stopping at the Stan Cassidy Centre. There, I was involved in a demonstration of the 3-camera VICON 140 system on behalf of my supervisor, Ed Biden. A young girl wore a tutu and the retro-reflective markers which allow the VICON system to follow markers in 3-D space. I was impressed by the attention and care she showed to the girl and her mother and the rest of us. Getting a good photo for the press was definitely lower on her priorities!

Personal Reflections, Kevin Englehart, former Director, faculty member, student, 1990's

There were a couple of amusing quotes from Prince Charles during his visit. He was greeted by students, faculty and staff in the hallway, as well as the Chancellor Frederik Easton who was beside me. Charles noticed the Venture Campaign lapel pins that several of us were wearing, and asked me what it meant. I explained that it was a fundraising effort. Charles' response was a deadpan: "oh dear, it's always about money, isn't it? How much?" I looked toward the Chancellor, and clumsily stammered, "you'll have to ask this guy."

Upon arriving upstairs in the meeting room and seeing a picture of Anne, he said, "oh, she's already been?"

Parents and Patients:

Since the prosthetics fitting centre was established in 1981 the Institute has seen over 250 amputees and has an active caseload of about 150. The description below speaks to the care provided and to the ability to create novel devices.

J.C. Beniot speaking of his son Sam.

Hi to all the team at Biomedical center.

On behalf of my family and especially my son Samuel, I would like to thank you so very much for all the good services we received from your establishment.

You have all worked so very hard and given us so much hope over the past 20 plus years.

I can still remember the first day we visited the Biomedical center, Samuel was around 3x months old, how difficult it was for us.

We were so lost in search of any help we could find, and as soon as we met you all that morning an enormous weight was taken off our shoulders, and slowly we could start to see better.

We started to realize that we were not alone and best of all we could count on your support to go through these difficult times.

All our visits thereafter at the Biomedical center was like a small family vacation for us. We always brought the whole family and sometime even the dog. We even arranged our visits at the clinic along with some family shopping and even some camping at the local campground. These precious moments are engraved forever in our mind.

Thanks to your exceptional team, Samuel has grown to become the confident young man that he is today, the word **never** no longer exists in Sam's vocabulary it has been replaced by a million possibilities.

With all your ingenuity and specialized workmanship, we received various state of the art prostheses : Myo, passive hand, hockey adaptor, drumming arm, and guitar pick holder and more...

You made it possible for Sam to do everything like any kid of his age. There was never any problem too big or too difficult for you to solve, if we could dream it, you could build it for us, you always found a solution.

Samuel's Hockey device came with a quick disconnect, a true success (see attached sketch and photo).

Sam's coaches had always told us that Sam could play better with one hand than the entire team with both hands.

We will always be grateful for all your contributions to Samuel's well-being.

Thanks for your friendship and all the good laughs and jokes, especially the five-finger trick, and that funny lobster hand.

You always took time to listen to our concerns and made us feel very special.

Also, thanks to the WarAmps Champ program, Samuel was able to receive funding for all his prostheses, he also received very generous grants for his studies.

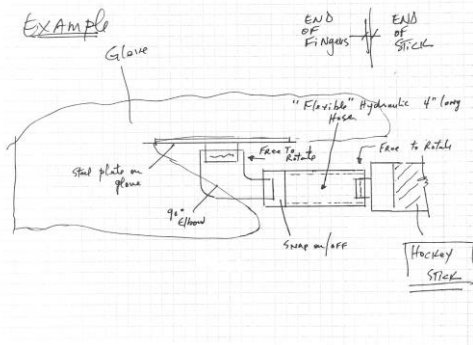
Today Samuel is 23 year old, he is studying to become an Engineer, he just completed his 3rd year in a five year program at ETS in Montreal.

He is following his father's footsteps and I could not be more proud.

Best Regards,

Sincerely,

Jean-Charles Benoit & Family
On behalf of Samuel



Students

The Institute has had students from the beginning. The model, for many years, has been to have graduate students enrolled in “home” departments, usually corresponding to their supervisor’s affiliations. As Carlos Novo noted in his reflections above, the doors were usually open and the faculty very willing to interact with students.

IBME graduates are represented across Canada and around the world in clinical, business and faculty appointments.

Student reflections: Nancy Black PhD student (2001), now faculty member at U de Moncton

Hello all

Memories that stand out particularly:

- 1) Participating in the 1999 MEC conference ‘Narrowing the gap’. This was my first opportunity to meet manufacturers of Myo-electric prostheses. It was magical to share time with people focused on improving the lives of people living with amputations through appropriate use of these engineering tools.
- 2) Multiple times working in the computer lab with the large screen & powerful computers in the company of other graduate students. This was my first experience feeling part of a graduate student community. It is one of my best memories of my PhD degree at the IBME. Despite our varied backgrounds, when one came to a problem coding in MATLAB, there was always someone ready to assist. Whew! I had the feeling I was not in this alone.
- 3) I was living in Moncton where I was a new faculty member as I was doing my PhD in Fredericton. The first terms, I had courses, including the evening ‘Introduction to Biomedical Engineering course’ after which I had to travel the Coles Island cut-off (pre-TransCanada Highway between Moncton and Fredericton) where there was not much traffic and frequently deer who would wander on the ‘highway’. Dr. Dennis Lovely lent

me his satellite cell-phone normally kept on his boat. This phone was the size of a large purse! It made my twice weekly 2-hour drives less scary, though I happily never needed to use it!

Thank you to all those present during my time studying at the IBME: 1995-2001, including particularly my supervisors – Dr. Ed Biden and Professor Jeremy Rickards, without whom I would not be where I am today!

Nancy

Nancy Black, PhD, Ing.
Professeure agrégée
Département de génie mécanique, Faculté d'ingénierie

[Student Reflections: Katelynn Everett, MScE, PEng, Engineer with Point of Origin Consultants Ltd.](#)

Hi!

As promised, I've pulled the following IBME-centric stories from the vault.

I have three stories, one from each phase of my life at IBME.

Phase 1- Undergraduate summer student, 2006. Katelynn Everett

It was the summer of 2006. As one of Dr Biden's undergraduate summer students, I was, along with three others, stabled in a windowless room in basement of the IBME where I wrote a lot of Matlab code. Dr Peter Kyberd also had a student or two in the room and midway through the summer, he decreed that we required some entertainment while we worked on our respective projects. One hot midsummer day, he descended into our quiet, cool basement with a ghetto blaster in one hand and a bag of cassette tapes in the other. We were skeptical. Our

skepticism didn't decrease when he announced the content of the cassette tapes: the BBC Radio production of Douglas Adams' Hitchhiker's Guide to the Galaxy. I think we all expected some dry, difficult-to-understand British humor, but with a twinkle in his eye, he plugged in the first tape, pressed play, and it didn't take long for us to be fully engaged with Arthur Dent, Ford Prefect, Zaphod Beeblebrox, Marvin and all the rest. Peter would come downstairs at intervals and enthusiastically change the tape, careful to meter out the story over the next several weeks and ensuring this became a highlight of the summer as we worked away in the basement of the IBME.

Phase 2- Not-quite-graduate summer student, 2008. Katelynn Everett

I passed the time between graduation in May 2008 and the beginning of graduate work in September 2008 as a summer student for Dr Peter Kyberd. The main goal of the summer was to collect some more data for the ankle-foot prosthesis developed through Mike Mitchell's thesis. Through his connections with a prosthetist in another part of the province, Peter tracked down an individual who met the criteria and was willing to participate. This was the first non-IBME subject that I'd run through the VICON lab and I was a bit nervous, but the day arrived and the subject rumbled in on his Harley Davidson motorcycle. He seemed like a pretty tough biker but I figured we could become friends because I had a secret weapon. I struck up a conversation about his motorcycle, we became fast friends and testing went without a hitch. My secret weapon? He had the exact same motorcycle as my father, which was the only bike I knew anything about at the time! I don't think I ever let him in on that secret though....

Phase 3- Graduate student, 2010. Katelynn Everett

The main objective of my Masters thesis was to assess joint loading in children using a prosthesis. Carly Genn, another student of the IBME and a good friend, was also working on her Masters thesis which involved electromyographic data collected on children using a prosthesis. As our projects were complementary, it was decided that we would collect data together using

an instrumented bicycle and swing. Each was equipped with task-specific transducers meant to gather motion and force data which would then be used to create the joint and calculate joint forces and moments for my project, and the child was outfitted with EMG electrodes for Carly's project.

To collect the data, the IBME had a dedicated room which housed our third and sometimes unwilling partner: the VICON system. I think the best way VICON's quirks can be described (at least in 2010) is that sometimes it's just too high tech for itself.

Over the months we learned how to cooperate with the VICON system and designed a protocol to help keep things simple. A fair amount of setup and calibration was required, and an added complication came from us using so many analog channels that we needed an expansion hub for the force transducers.

On a data collection day early in the process, we set everything up in advance of the subject's arrival, and thought we had it all sorted out. The subject arrived and successfully ran through our protocol. Everything seemed to have gone without a hitch. Carly checked her data and nodded in approval. I checked my data and found nothing. With a twinge of panic, we reviewed all the setting and gave the VICON system a once over. About ready to tip the system over, I saw the expansion hub out of the corner of my eye and noticed the power cord for the hub out of the corner of my other eye. It had become unplugged at some point so my transducers had no power and therefore collected no data. There's no feeling like "Surprise- no data!" after a day of collection!

Hope that helps! I wish you luck in your story collecting!

Recruiting

Recruiting Greg Bush at ACPOC in Florida at the Tradewinds, 1994. Greg Bush, Research Prosthetist

Ed Biden, then the IBME Director, had made contact with Greg Bush who was at Bloorview in Toronto about a potential move to Fredericton and since they were both to be at

the ACPOC meeting at the Tradewinds Hotel in St. Pete Beach, Florida, they agreed to meet to discuss the possibilities. They slipped away for their discussions leaving Dinah Stocker the Occupational Therapist to come up with a believable explanation for the Toronto crew, as to where and why the pair of them had disappeared. Greg has always described this as “the long walk on a short beach” but it led to more than 25 years at IBME.

[Recruiting Jon Sensinger: Jon Sensinger Director IBME 2019](#)

Hi Ed,

Here's a story for you.

IBME tried to recruit me for several years before they were successful. During the process a potential snag came along the way regarding a potential US veterans affairs position to which I'd have to commit. When Kevin Englehart relayed the incident to Bob Scott, it gave him déjà vu. Apparently Bob Scott had successfully finalized the paperwork to recruit Dudley Childress to IBME. Dudley called him shortly thereafter to politely ask if he could rescind his acceptance, as the VA had offered him a prestigious position. Dr. Childress went on to direct the influential Northwestern University Prosthetics Research Laboratory and the VA Chicago motion analysis research laboratory. When I decided in grade seven to pursue a degree in prosthetics, I was directed to “go get my PhD from Dudley Childress at Northwestern University”, and so I did, obtaining my PhD within Dr. Childress's lab under Richard Weir's supervision. It is fun to think how the circle was eventually completed – just two generations later than originally hoped.

Sincerely,

Jon

My start at IBME and outcome measures: Wendy Hill Occupational Therapist

My work at IBME started at MEC in 2002. I was asked by a co-worker at my previous job in pediatric neuro-rehab if I knew anyone interested in a job at IBME. The OT who had been there a long time was off on a sick leave and they needed someone to fill in. Well, I didn't take long deciding about that opportunity! It was a perfect job for an OT who enjoyed learning about new technology, working with people of all ages and dealing with one-handed functioning. I quickly put my name forward and when Bernie called me to see if I was interested in attending a session for OTs learning about myoelectrics at the upcoming MEC conference, I jumped at that too! It was a great introduction to the field of upper limb prosthetics, and I met other therapists from around the world at that two-day course that are among my most valued friends and colleagues today.

About a year after starting work at the clinic, I was asked to co-chair the following MEC, as the practice was to have one of the co-chairs be a clinician to ensure there was content that would be useful and would appeal to therapists and prosthetists and to plan the pre-conference days that were specific to each group. My first thought was "how am I going to teach therapists anything about this field when it is so new for me?" Many of the people I met at the pre-conference days when I started were not new to the field and the thought of having to prepare content that would be useful for them terrified me. After some reflection, I started to think about what things were important to me as a therapist new to an area of practice. I relied on outcome measures and checklists to ensure I was covering the things that were important to my clients and the skills they were expected to have. I noticed that there were not very many outcome measures at the time that were available to me and I wondered if this may be an opportunity to share ideas with other people around the world in this field. Maybe other places used other measures and we could learn from each other. At the very least, I figured if I planned a bunch of sessions for people to present on different tests, it would fill up time, and I would not be responsible for presenting for two full days.

As it turns out, the two-day outcome measures session at MEC 2005 was well attended by many therapists, prosthetists and scientists. Many people were interested in outcome

measures! There were great discussions and that session snowballed into the formation of the Upper Limb Prosthetic Outcome Measures Group that went on to recommend a number of measures that were valid and reliable as they were, recommended changes to some other measures, and identified the gaps in what was needed in the field. There has been lots of work in this area since that time, but I like to think that my fear of having to speak for two days had something to do with it.

Wendy Hill

Meeting Bob Scott when we were visiting: Ed Biden, Former Director

In the fall of 1986 we were on the East Coast to show off our, almost, one year old daughter.

Visiting Mechanical Engineering Dave Bonham, the Chair, suggested I apply for a job they had open. I'd been in San Diego for almost 5 years and I didn't want to give up on Biomedical Engineering so I stopped in to see Bob Scott and asked him if he thought there was an opportunity for a Mechanical Engineer in the Institute and he said he thought the Institute was open to expanding its interests. That assurance and the open Mechanical Engineering position lead to coming back to UNB and the last 30+ years.

Other tales:

Kevin Englehart, former Director, faculty member, student, 1990's

Of all the happenings at IBME over the years, few are appropriate for mass consumption due to privacy issues. One that does stand out as particularly funny is the time that someone called to inquire whether we had any expertise in euthanasia. Our secretary, didn't quite understand the question, and responded that we had a number of Asian students, who might be willing to speak about "youth in Asia."

Murray Olive and Injection moulding : Ed Biden Former Director and Faculty Member

IBME had a grant from CIBC which was to develop child size components and in particular the “in wrist” controls which went with the Steeper Child Size Hands. The project supported over half the Institute and, unfortunately, was withdrawn as the bank’s priorities changed. This led to the first ever layoffs of full time staff and the reverberations continued for many years.

Murray Olive who was an injection mouldmaker with Optyl, who were making eye-glass frames in Oromocto, was laid off from that operation when it left the province. Bob Scott recruited him to make moulds for the CIBC project. Working with a small machine shop and a small vertical, single cavity, injection moulding machine, Murray’s work continued for years. When the CIBC project ended Bob advertised the service around campus and beyond. Over time Murray made custom test tube stoppers to support David Coombs in Biology, and for a number of years made the packaging for Liberty Technology battery packs in the days when it was common to have removable batteries.

Dov and the low clearance doorway: Ed Biden, Former Director

Dov Goldvasser, now Dr. Dov Goldvasser, living in Massachusetts, was among many students who occupied the basement room in IBME. The ceiling was low and the floor severely slanted to facilitate drainage when the Geology Department had occupied the building and needed good drainage for soil and rock sample preparations.

The door was low (still is but we don’t put people out there any more) and Dov smashed his head into the concrete lintel several times before finding some foam and caution tape and padding the offending door frame.

Invitation

If you have read these stories and have one to add please send it to Ed Biden at biden@unb.ca