



NEWSLETTER

VOLUME 5 NUMBER 3

OCTOBER 1997



The Alberta Clinical Engineering Society

PRESENTS

The 1997

ACES Provincial Conference

November 5 – 6, 1997

The Foothills Hospital
1403 – 29th St. N.W.
Calgary, Alberta

Co-sponsored by Alberta Medical Equipment Vendors

Registration Forms and conference agenda enclosed.

*For more information and online registration see the ACES Web Page at
<http://skynet.uah.ualberta.ca/~aces>*



TCP/IP Overview

by Michael Mah

Recently, we have seen increasing amounts of computer and network influences in our day to day functions. I was asked to do some research into one of the most common suites of computer protocols. Here is my attempt to do this column justice as I put this introduction of a complex protocol into rudimentary terms. The name TCP/IP is derived from two of the protocols it encompasses, Transmission Control Protocol and Internet Protocol. A protocol is a set of rules, which in the TCP/IP communications arena was formed by open development, documentation, modification and consensus.

The strengths of TCP/IP and some of the main reasons for it being embraced by many Information Systems departments and manufacturers can be summed up by these reasons.

- As mentioned above it is an open protocol, therefore it is freely available and widely supported. As most vendors can develop their applications it can be used to connect most types of hardware and software.
- It is independent of the physical structure of the network and can operate on Ethernet, Token Ring, X.25, modem lines, and most others.
- It utilizes standardized high level protocols
- It has a flexible addressing capabilities, which can be setup for both small and large networks.

The TCP/IP protocol architecture is made up from separate layers each having a different function. The layers add or remove additional header information depending on the direction of data flow to or from the physical network.

Top	Application Layer (<i>programs/applications which have network access requirements</i>)
↑↓	Host to Host Transport Layer (<i>Addressing</i>)
↑↓	Internet Layer (<i>structure and routing of data</i>)
Bottom	Network Access Layer (<i>placing data onto physical network</i>)

Applications like FTP, TELNET and SMTP will access network resources and trigger the transport layer. As they send data down, the transfer layer will add a control header to the data, which would have information like address and error checking. The data then would progress to the Internet layer where another control header is added and where it is fragmented and routed in smaller datagrams onto the network access layer. This layer is required to format the datagrams to be acceptable to the network structure and therefore must know some information about network layout and configuration. It frames the datagrams with more control information and puts it onto the network.

Once on the network the framed data is sent to another computer where it begins to work it's way back up the layers and the control information is stripped and the



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Technology at the ACES Provincial Conference



data put back into order to be given to the receiving application.

TCP/IP is an expansive topic and books, courses and standards and RFC's (request for comments) have been dedicated to it, which can afford to go into much greater detail on this protocol. However, I hope this brief introduction will help some understand the benefits and basic workings of this protocol. If you are looking for more information on this protocol take a look at these websites:

InterNic

<http://www.internic.net/ds/dspg0intdoc.html>

IETF <http://www.ietf.org/>

Or if you are looking for a good reference book TCP/IP Network Administration published by O'Reilly & Associates, Inc.



Clinical Engineering Employees at the "MIS" Join H.S.A.A.

On September 18, 1997, the Alberta Labour Relations Board ruled decisively that the Clinical Engineering employees at the Misericordia Hospital are to be included in the paramedical technical bargaining unit represented by the **Health Sciences Association of Alberta (H.S.A.A.)**.

The "technical" part was clear we apply technical knowledge gained through a course of study. We were found to be "paramedical" because the focus of our work is on the direct support of patient care activities of the clinical staff.

We send a "Thank-you" to our colleagues at the RAH, the UAH, and the metro-Calgary Hospitals for their efforts in establishing precedents, and to Kay Willekes of H.S.A.A. for representing us well.

The GNH Clinical Engineering employees have also made application to enter H.S.A.A.; this work is in progress. Their current union is not opposed, so hopefully this change will proceed smoothly.

	Shane Gormley Territory Manager
	 Valleylab Canada Pfizer Hospital Products Group 50 Mural Street, Unit 11 Richmond Hill, Ontario L4B 1E4 Canada Tel: 905 764 6800 Fax: 905 764 7101 Mobile/Pager: 403 651 3570 Customer Service: 800 668 1832

THE CANADIAN MEDICAL AND BIOLOGICAL ENGINEERING SOCIETY

24th Canadian Medical and Biological Engineering Conference
June 28 to 30, 1998



"Assessing the Impact"

Sheraton Grande Hotel, Edmonton, Alberta

In association with ACES; Chair of the Continuing Education Committee
Watch for your CMBES Continuing Education Survey in your mail!



The following article provided by Dr. Coe is an example of the dedication and service of the Alberta Biomed. The following article describes an RF catheter & kit which was designed with the co-operation of a number of Biomedes at the University of Alberta and is just a small sample of the expertise available in our province in the area of Biomedical Technologies.

COE™ Ablation Catheter & Kit

by Dr. J.Y. Coe MD

Description of Disease

Pulmonary atresia with intact ventricular septum describes patients born with "isolated absence of normal communication between the right ventricle and the pulmonary artery. The pulmonary valve is sealed or imperforate.¹ The ventricular septum is intact. Pulmonary blood is usually provided by the ductus arteriosus or rarely by multiple aortopulmonary collaterals. The heart is normally related (concordant), between the atria and ventricles, and between the ventricles and great vessels. The disease occurs in 1-3% of all congenital heart defects, and comprises 25% of newborns with cyanotic congenital heart defects.² Shortly after birth, the ductus arteriosus normally undergoes spontaneous closure cutting off the blood supply to the lungs. If the pulmonary blood flow is not restored by reopening the ductus arteriosus with prostaglandin, the baby dies.

Usual Therapy of the Disease

In this ductal dependent cyanotic congenital heart malformation, initial medical resuscitation consists of intravascular administration of prostaglandin. The right ventricle and the pulmonary arteries are often hypoplastic making the surgical creation of an aortopulmonary shunt the only possible palliation, usually a modified Blalock-Taussig Gortex shunt. At times the pulmonary arteries are too small (< 2 mm) making the surgery not possible. In these neonates, long term prostaglandin (oral or intravascular infusion) will allow the infants to grow until surgery is possible.³ In other babies with pulmonary atresia and intact ventricular septum, the right ventricle is well formed with all the three portions of the right ventricle represented (inlet, apical trabecular and outlet components or tripartite structure). If the pulmonary artery is of normal or near normal size and the pulmonary valve present but imperforate, right ventricular - pulmonary artery communication can be established by surgical pulmonary valvotomy or more recently by catheter means. Currently, transcatheter means include placing an end hole catheter antegrade in the right ventricular outflow tract positioning the end hole just below the imperforate pulmonary valve.⁴ The latter is perforated using blunt wire.⁵ or a laser wire^{6,7} or a radiofrequency wire.^{8,9} Once the imperforate pulmonary valve is punctured, a guide wire is placed across it into the pulmonary artery to form a track for an angioplasty balloon to dilate the valve.

Preclinical Studies

See abstract submitted to AHA

Why is this device needed?

It is proposed that the RF catheter & kit submitted for approval will improve the success and reduce the time needed for transcatheter dilation of the pulmonary valve in pulmonary atresia thereby lowering the procedural mortality and morbidity. The three right ventricular approaches described above may be successful in puncturing the imperforate pulmonary valve, but, the puncture is only useful if a guide wire can be passed through the minute hole into the pulmonary valve.

The advantages of the proposed RF kit are threefold: -

1. transductal supra-ventricular approach to avoid right ventricular irritation viz., not arrhythmogenic
2. a centering balloon catheter to allow central puncture of the imperforate pulmonary valve, and,
3. a unique RF catheter to allow not only the perforation of the imperforate pulmonary valve but the passage of a guide wire upon puncture to permit immediate passage of a guide wire, and, subsequently, a balloon angioplasty catheter for dilation.

Reference List

1. Freedom RM. Pulmonary valve atresia and intact ventricular septum. In: Emmanouilides GC, Allen HD, Riemenschneider TA, Gugesell HP, eds. *Heart Disease in Infants, Children, and Adolescents*. Baltimore: William & Wilkins, 1995;962-983.
2. Riemenschneider TA, Mahoney LT. Pulmonary atresia with intact ventricular septum. In: Adams F,H, Emmanouilides GC, Riemenschneider TA, eds. *Heart Disease in Infants, Children, and Adolescents*. Baltimore: Williams & Wilkins, 1968, 338-348.
3. Silove ED, Coe JY, Shiu MF, et al. Oral prostaglandin E₂ in ductus-dependent pulmonary circulation. *Circulation* 1981;63:682-688.
4. Radke WAK. New pediatric applications and techniques for balloon valvuloplasty: Tetralogy of Fallot, complex pulmonary stenosis/atresia, and pulmonary atresia with intact septum. *Prog Pediatr Cardiol* 1996;6:105-116.
5. Rao PS. Role of Balloon Dilation and other Transcatheter Methods in the Treatment of Cyanotic Congenital Heart Defects. In: Rao PS. Ed. *Transcatheter Therapy in Pediatric Cardiology*. New York: Wiley-Liss, 1993. 229-253.
6. Riemenschneider TA, Lee G, Ikeda RM, et al. Laser irradiation of congenital heart disease: Potential for palliation and correction of intracardiac/intravascular defects. *Am Heart J* 1983;106:1389-1393.
7. Qureshi SA, Rosenthal E, Tynan M, et al. Transcatheter laser-assisted balloon pulmonary valve dilatation in pulmonary valve atresia. *Am J Cardiol* 1991;67:428-431.
8. Hausdorf G, Schneikider, Lange P. Catheter creation of an open outflow tract in previously atretic right ventricular outflow tract associated with ventricular septal defect. *Am J Cardiol* 1997;72:354-356.
9. Rosenthal E, Qureshi SA, Chan KC, et al. Radiofrequency-assisted balloon dilatation in patients with pulmonary valve atresia and an intact ventricular septum. *Br Heart J* 1997;69:347-351.
10. Coe JY, Chen RPC, Dyck J, Byrne P. Transaortic balloon valvuloplasty of the pulmonary valve. *Am J Cardiol* 1996;124-126.

Title:

TRANSDUCTAL APPROACH TO ESTABLISH PULMONARY CONNECTION IN PULMONARY ATRESIA (PAtr) USING A NEW RADIOFREQUENCY (RF) CATHETER IN LAMBS

Abstract

Transcatheter perforation of the pulmonary valve (PV) in PAtr with a RF wire, conventionally approached antegrade from the right ventricle (RV), is at times difficult, arrhythmogenic and risk myocardial perforation. We hypothesize that a retrograde method inflating an end hole balloon catheter placed transductally above the imperforate PV will centralise the catheter lumen to allow more precise puncture of the PV. A lamb model of PAtr was created under GA by stenting the ductus arteriosus (DA), balloon atrial septostomy, and complete pulmonary artery (PA) interruption by a pericardial diaphragm to simulate an imperforate PV, placed in the main PA via a left thoracotomy. Occluding PA flow (n=5) decreased PaO₂ from 106± 5.6 to 28 2.9 mmHg, aortic pressure 72± 5.4 to 46 ±7.4 mmHg, and increased RV pressure from 32± 2 to 50 ±5.3 mmHg. The Fr end hole balloon catheter 0.038" lumen) was passed retrograde up the aorta across the DA into the PA. Inflating the balloon just above the PV, the PV was perforated with an new RF catheter (0.035" shaft, 0.014" lumen) to place 0.014" guide wire in the RV. 5-25 watts RF energy for 10-20 sec, 4-6 times was used. Leaving the guide wire in place, removal of the balloon and RF catheters will allow the passage of an angioplasty catheter over the guide wire to dilate the newly perforated PV.

We conclude that it is feasible to perforate the pulmonary valve in pulmonary atresia using a transductal approach. Safer puncture is facilitated by a balloon catheter to centralise the end hole. Once perforated the RF catheter allows immediate guide wire passage for the pulmonary valvuloplasty.



The Alberta Clinical Engineering Society

PRESENTS

1997 ACES Provincial Conference

Date: November 5 – 6, 1997

Location: The Foothills Hospital
1403 – 29th St. N.W.
Calgary, Alberta

Day One

Guest Lecturers 8:30am to 4:30pm

Exhibit Booths 9:00am to 3:30pm

Coolmbs Lecture Theater:

- Narco Scientific
- Valleylab
- Siemens
- Inset Specialties
- Bowers Medical
- Dynamed/Physio-Control/Allaris
- Puritan Bennett
- Loctite
- Spacelabs

Annual General Meeting 4:30pm

Evening Social 7:00pm

- Schanks Athletic Club
Buy Tickets in Advance for \$15.00

Day Two

Technical Sessions:

- Plastics and Polymers 8:30am to 4:30pm
- Local Area Networking 8:30am to 4:30pm
- Ventilator Service, *Brathwaites Oliver* 8:30am to 12:00pm



1997 ACES Provincial Conference Agenda

Day 1: November 5th

8:30	Registration
8:45	Welcoming Remarks
9:00	Erin Ohara Surgical Smoke: A Three-Part Investigation of Health Risks Protective Measures and an On-going Research Project.
9:45	Alex Sackiw RFP and Equipment Purchase Evaluations: The How To's
10:30	Coffee Break
10:45	Joel Koehler Maintenance Support for Imaging Systems
11:45	Lunch: served in lobby at Coolmbs Lecture Theater
1:15	Linda Vanneste QMI System (Networking)
2:15	Rob Mckinly The Effects of Syringe Size on the Flow Dynamics of Syringe Infusion Pumps"
2:45	Coffee Break
3:00	Ron Van Vliet Biomedical Training to Come, NAIT Update
3:30	Margarita Loyola The BC Perspective
4:30	Annual General Meeting

Conference Co-Sponsors & *EXHIBIT BOOTHS*

THE FOOTHILLS HOSPITAL COOLMBS LECTURE THEATRE
NOVEMBER 5th 9:00AM TO 3:30PM

Narco Scientific
Inset Specialties
Bowers Medical
Puritan Bennett

Valleylab
Siemens
Loctite
Spacelabs

Dynamed/PhysioControl/Allaris

Evening Social: Shanks Athletic Club @ 7:00pm See Advertisement in Newsletter.

1997 ACES Provincial Conference Agenda

Day 2: November 6th

Plastics and Polymers: Hands on Workshop

This workshop will introduce repair techniques for plastics and elastomeric parts. Identification of plastics is featured using simple methods to permit correct choices of repair techniques and bonding agents. Participants will develop repair methods in hands-on exercises involving flexible and rigid mould making, casting replacement parts, bonding, joining and crack repair including reinforced elastomeric repairs. Precautions to be adopted to ensure satisfactory functional and aesthetic repairs will be given.

This course is presented by Jack Warwick Foster of the University of Alberta Plastics Engineering Department.

8:30am to 4:30pm at the Foothills Hospital

Members: \$60.00

Non-Members: \$80.00

Price includes danish/coffee/tea/juice in morning and afternoon.

Local Area Networking: Introduction To Data Communications

Course includes the following:

1. Basic Concepts
2. Bridging
3. Routing
4. Switching
5. Protocols
6. Network Management
7. Remote Access
8. Virtual Private Networks
9. Firewalls
10. Particular Requirements in Healthcare

This course is presented by Gordon Blinston of the Royal Alex Hospital Information Services Department.

8:30am to 4:30pm at the Foothills Hospital

Members: \$60.00

Non-Members: \$80.00

Price includes danish/coffee/tea/juice in morning and afternoon.

Brathwaites Olivier: Ventilator Service

A technical service training course on the Drager Avita 4. Overview on the operation of device including explanations on the new modes of ventilation. A overview on the service of the Avita 4 is also included.

8:30am to 12:00pm at the Foothills Hospital

Members: \$30.00

Non-Members: \$50.00

Price includes danish/coffee/tea/juice in the morning.

**REGISTRATION FOR COURSES WILL TAKE PLACE
IN THE LECTURE THEATER LOBBY AT 8:00AM**

Registrant's Name: _____

Mailing Address: _____

Conference Registration:

*Includes admission to the Lecture Theatre and Exhibit Hall.
Breakfast and Lunch are also included.*

..... Member
\$30.00

..... Non-Member **\$50.00**

Advance 1998 membership\$
10.00

(Avoid a possible 1998 membership increase.)

Non Member:- Membership required

.....

1997 Memberships are still available for only \$10.00.

(Please Complete the Membership Application)

- Membership Not

Required.....

Course Fees

Plastics and Polymers Workshop Member **\$60.00**
..... Non-Member **\$80.00**

Braithwaites Olivia: Ventilator Service Member **\$30.00**
..... Non-Member **\$50.00**

Local Area Networking: An Introduction Member **\$60.00**
..... Non-Member **\$80.00**

Social Event Tickets : **Shanks Athletic Club** \$
15.00

(including dinner, two drinks, and the corporate mini olympics)

Accommodations:

Billeting is available in Calgary offered by numerous Calgary BMETs.
For group rate booking of hotel rooms please contact Brandon
Beaudry
at (403) 492-6711 or indicate your choice

Billeted Room Required(No
Charge)

Group Discount Hotel Reservation Required.....

- **Quality Inn-** (Crowchild and 16th Ave N.W\$71.68 tax incl).

**Please Contact me with Details at Ph: _____

**Please Complete
the Following Fields**

\$ _____

\$ 10.00 ,

\$ _____

\$ _____

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\$ _____

\$ _____

Total \$ _____

Accommodations:

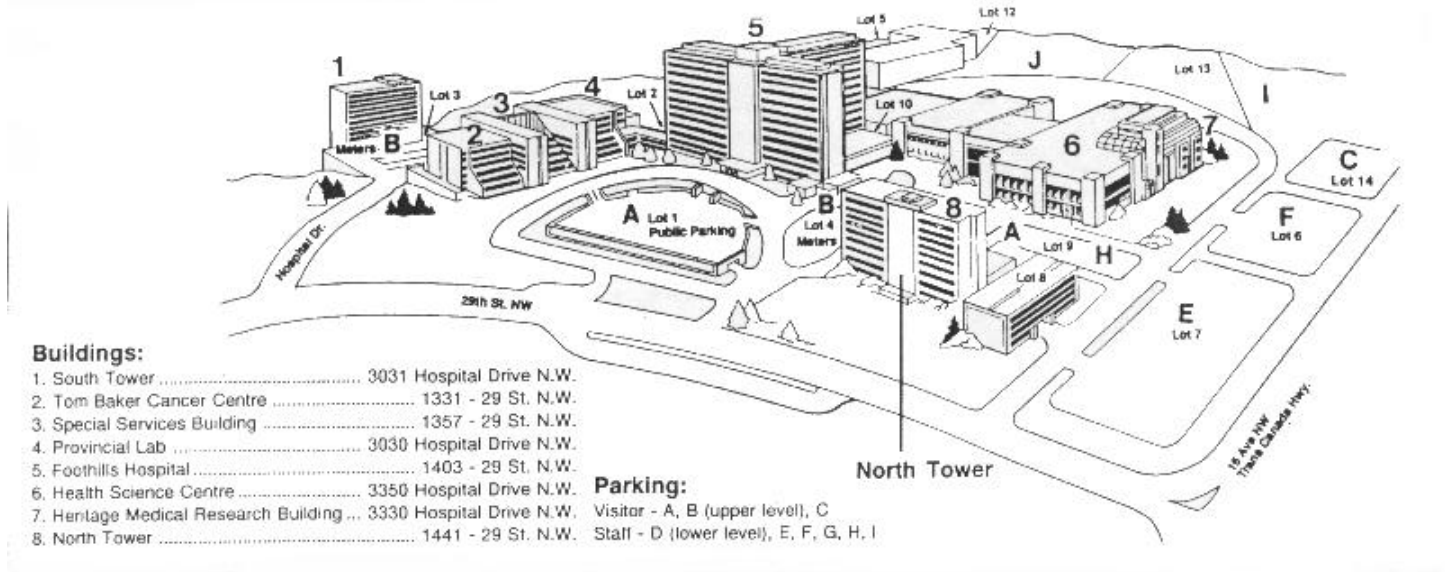
\$ _____

Please Fax Advance Registration Form To : Brandon Beaudry Fax: (403) 492-7082

Registrations must be received by **October 28th.**

Foothills Hospital

Coombs Lecture Theatre is located on the main floor of the main hospital, building "5"



- Buildings:**
- 1. South Tower 3031 Hospital Drive N.W.
 - 2. Tom Baker Cancer Centre 1331 - 29 St. N.W.
 - 3. Special Services Building 1357 - 29 St. N.W.
 - 4. Provincial Lab 3030 Hospital Drive N.W.
 - 5. Foothills Hospital 1403 - 29 St. N.W.
 - 6. Health Science Centre 3350 Hospital Drive N.W.
 - 7. Heritage Medical Research Building ... 3330 Hospital Drive N.W.
 - 8. North Tower 1441 - 29 St. N.W.

- Parking:**
- Visitor - A, B (upper level), C
 - Staff - D (lower level), E, F, G, H, I

Membership

To enjoy the benefits of ACES and to continue receiving the ACES newsletter and meeting notices, become a member now! Enclose a \$10.00 cheque and return this application with label attached or complete the following form to update your information.

Return to:

**The Alberta Clinical Engineering Society
c/o The University of Alberta Hospitals
Clinical Engineering Room 0D1.00
8440-112 Street
Edmonton, Alberta
T6G 2B7
ATTENTION: Brandon Beaudry**

*Are you reading this but are not on the ACES mailing list, No Problem!
Fill out the requested information and send to the above address.*

ACES THANKS YOU FOR YOUR SUPPORT

** Members who have not yet received Membership Cards or Pins
Please contact Brandon Beaudry via pager @ 445-6330 or via E-mail at bbeaudry@cha.ab.ca

Business Information

Company: _____
 Position (Title): _____
 Department: _____
 Address: _____
 City: _____ Province: _____
 Postal Code: _____
 Work Ph: (____) _____ Ext: _____
 Fax: (____) _____
 E-mail: _____

Personal Information

First Name: _____
 Last Name: _____
 Home Address: _____
 City: _____ Province: _____
 Postal Code: _____ Ph: (____) _____
 E-mail: _____



Evening Social

November 5th @ 7:00pm

Shanks Athletic Club

9627 Macleod Trail South, Calgary, Alberta

Tickets Must be Purchased in Advance by October 30th

Tickets: \$15.00 *minimum of 20 persons*

Tickets Include Two Drinks, Supper and the Corporate Mini Olympics!

Four Events.....Fight for the Title!

Virtual Golf: give the ball a crack and see if you can get the longest drive.

Indy 500 Racing: burn rubber and watch those turns because you will be competing for the fastest lap.

Pro Putt: three holes of avoiding the water and ruff, lowest strokes win.

Three Ball Pool: chalk-up your cue and sink three balls, lowest strokes win.

- Teams will be made up of six (6) or less.
- Approximately one and half hours of play.
- Great Team Building activity!
- Pro-rated scores—equal for males and females.

Purchase tickets in advance using the ACES Registration Form for the 1997 Provincial Conference located in this newsletter.

NOMINATIONS FOR ACES EXECUTIVE AND BOARD OF DIRECTORS 1997/1998

We are soliciting nominations for ACES 1998 Board of Directors. These nine positions are open to anyone with an interest in the field of Clinical or Biomedical Engineering in the province of Alberta. Those who let their names stand for election at our annual general meeting must consider the time commitment necessary to do an effective job in their respective tasks.

The Board of Directors includes the following positions:

PRESIDENT: Chief Executive Officer of the Society. Chairs all meetings of Executive, Annual General Meetings, and General Meetings. Reviews all activities of Society to ensure that Society's policies are being carried out. May appoint committees to carry out the business of the Society. Ensures proper interaction between Society and government agencies. May not chair a committee.

VICE PRESIDENT: Fills in for President when necessary. May not chair or serve on committees.

SECRETARY: Attends all meetings of the Society and Board and keeps minutes. Responsible for sending meeting notices, keeping membership records, etc.

TREASURER: Responsible in handling Society's finances, account for funds of Society, keep books, provide financial statements at the Annual General Meetings or as otherwise required.

CHAIRPERSONS OF THE PROFESSIONAL DEVELOPMENT COMMITTEE, COMMUNICATIONS COMMITTEE, THE MEMBERSHIP COMMITTEE, THE SOCIAL COMMITTEE, THE NEWSLETTER/PUBLICATIONS COMMITTEE, THE FUND RAISING COMMITTEE AND THE EDUCATION COMMITTEE: These positions are assigned at the first meeting of the new Board from among the Board membership. Each committee chairperson is responsible to recruit a well-rounded committee membership.

In the space provided please provide the necessary information for each nominee. Each nomination should be signed by a member(s) of the Clinical Engineering community. Nominees are eligible to run for more than one office if they state the order of preference of offices. **Nomination forms must have a short description of each candidate (no more than four sentences) attached to them.** Completed nomination forms should be mailed, faxed or e-mailed to the President, and must be postmarked not that October 31, 1997:

**The Alberta Clinical Engineering Society
c/o The University of Alberta Hospitals
Clinical Engineering Room 0D1.00
8440-112 Street
Edmonton, Alberta
T6G 2B7
ATTENTION: Brandon Beaudry**

E-mail: bbeaudry@cha.ab.ca

Nominee : _____
Organization/Address: _____
Nominators (names and signatures): _____ _____
Position(s) nominated for: _____

Membership Application

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Please contact Brandon Beaudry via pager @ 445-6330 or via E-mail at bbeaudry@cha.ab.ca*

Business Information

Company: _____

Position (Title): _____

Department: _____

Address: _____

City: _____ Province: _____

Postal Code: _____

Work Ph: (____) _____ Ext: _____

Fax: (____) _____

E-mail: _____

Personal Information

First Name: _____

Last Name: _____

Home Address: _____

City: _____ Province: _____

Postal Code: _____ Ph: (____) _____

E-mail: _____

NOTE: *If your personal information provided on the above label is incorrect please feel free to use this form letter to update our records*

1997 Provincial Conference Co-Sponsors