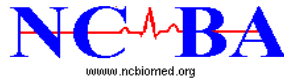

THE INTERMITTENT SHORT

Newsletter of the North Central Biomedical Association

www.ncbiomed.org

Spring 2000



Letter from the President



The responsibilities of the Biomedical Technician are continually evolving each year with the invention of newer technologies that are introduced into the medical field. This past New Years Y2K concern was a good indicator not only showing the amount of technology we rely upon today but the potential imperfections of the technology we have become so accustomed.

With this in mind we need to make our best efforts to work and maintain our proficiencies in this ever-changing Biomedical field. This could be a daunting task for those who are maintaining a large variety of equipment that are directly Biomedical related including equipment that would be considered peripheral to medical equipment. One example of a technology we find becoming a larger part of our realm of responsibility are computers and their associated peripherals. Not so many years ago this technology was limited to a specific type of medical equipment: CT, MRI and clinical laboratory to name a few.

But with the speed & power of the computer and the ability to process information in many fashions the integration of computers and the networking this information has become more of our responsibility for many of us today. With this thought in mind you have a resource available that will aid you to keep up with the ever-changing technologies.

The NCBA annual fall seminar is not only one source for maintaining your education but also gives you an opportunity to 'network' with others within our Biomedical profession. This years seminar will be held at the Holiday Inn-Metrodome in Minneapolis, MN on September 8, 2000. Mark your calendars for this years seminar.

To make the NCBA work for you we ask for your suggestions of classes you would like to see available along with vendors who's attendance you would find beneficial to our profession.

Ken Erickson
NCBA President

To find out the latest and what's happening with the NCBA and the fall seminar visit our website at www.ncbiomed.org



Spring Meeting



Spring Meeting

WHEN: March 10, 2000

WHERE: HealthEast St John's
NE 1575 Beam Ave
Maplewood, MN

ROOM: Education Center Room

SCHEDULE:

10:00 AM- 12:00 PM

Guest Speaker-Tim Spicer HealthEast Neurodiagnostic Department "Catching the Wave" Tim will discuss the various reasons for testing patients, the methods of application for testing, the reasons for testing special patients, and finally, show all of the different types of brain waves. There will be questions and answer time scheduled.

12:00 PM -1:00 PM

Lunch- Provided

1:00 PM - 3:00PM

Business Meeting

Directions to St Johns:

From the North: Take **HWY 35S to 35E South**. Take the **694E Exit**. The next exit to take off of 694 will be the **White Bear Lake Exit**. Take that **south to Beam Ave** and take a **right**.

St. John's will be on your right. Look for the signs for visitor parking. At information ask for the location of Education Room 2.

From the South: Take HWY 35 to 35E North through St Paul. (if taking HWY 52 North, take the 35E North exit in St Paul) Go North to HWY 36E and take the exit. Go to HWY 61N exit. Go north on 61 to Beam Ave. Take a right. St Johns will be ahead on the left. Look for signs for visitor parking. At information, **ask for location of Education Room 2**.

Any questions about the meeting , call Vickie Snyder, 651-232-2967

Business Meeting Agenda

1. Treasurers Report - Nancy Thomas

Old Business

1. Review Fall Meeting Minutes
2. Review Winter Meeting Minutes

New Business

1. Spring 2000 Meeting Location - Ken Erickson
2. Website Improvements - Ken Erickson



Winter Meeting Minutes

NCBA Business Meeting

November 5, 1999
St Joseph's Medical Center, Brainerd, MN

The meeting was called to order at 3:00 p.m. by President Ken Erickson.

The Summer meeting minutes were read and approved.

The Fall meeting minutes will be read at the March meeting.

The Treasure's report was given by Nancy Thomas. The current balance of \$4565.23 was approved.

Old Business

- Vickie Snyder is working on the Spring meeting. It may be held at the Baccan museum in Minneapolis and sponsored by Healtheast.

New Business

- The 2000 Seminar will be held in the Twin Cities area. A particular conference center has not yet been chosen. Ken Erickson is working on it, and will take any suggestions for reasonably priced centers.
- Ken Erickson is working on making the website more interactive. So educators and vendors can sign up right on the web page. He is also working on making the membership section more informational to individual members, mailing address, meeting attendance, dues paid.
- The 2000 Budget will be in the Spring newsletter.
- A rough map of the membership is available from Jennifer Kriske. Ken Erickson will try to get it posted on the website.

- Dave Peterson noted that we are having the next three meetings in the Twin Cities areas. A discussion was held and it was determined that we need more out-state people to volunteer to hold a meeting.
- Mary Ross will hand out some of the NCBA brochures out to service personnel, and suggested we get more active in recruiting new members, and awareness of the NCBA in general.
- Bill Maras will find out about getting more brochures printed.

Meeting adjourned.

Jennifer Kriske
NCBA Secretary

To find out the latest and what's happening with the NCBA and the fall seminar visit our website at [www. ncbiomed.org](http://www.ncbiomed.org)



North Central Biomedical Association Scholarship

NCBA offers \$250.00 scholarships each spring. These scholarships are intended to aid a student currently involved in a Biomedical Equipment Technology program, as well as any biomedical technician or manager who is considering or is currently obtaining continuing education.

For consideration please submit the following information:

1. Your name, address, and phone number's at work and home.
2. The educational institutions name, address, and phone number.
3. A brief description of the course or program you are involved in.
4. A letter outlining your future goals in the biomedical field.

To: Attn. Ken Erickson
HCMC Bioelectronics Dept.
701 Park Av. ADABEC 860A
Minneapolis MN 55415

Deadline is April 15th



BIOMEDTRONICS INC

433 4TH STREET
MT. IRON MN 55768-9519

800-777-7540

1-218-740-6888 Voice/Fax

E-mail

BIOMEDTRONICS@RANGENET.COM

WWW.RANGENET.COM/BIOMEDTRONICS

DEALER FOR:

- ◆ **BIO-TEK:** MEDICAL PERFORMANCE AND TEST EQUIPMENT
- ◆ **OPHIR:** LASER TESTING EQUIPMENT
- ◆ **VICTOREEN:** RADIOLOGY AND IMAGING TEST EQUIPMENT
- ◆ **HAMEG:** ELECTRONIC TEST EQUIPMENT
- ◆ **WESTERN:** DIALYSIS
- ◆ **RIKEN:** ANESTHESIA

SALES (NEW AND USED), SERVICE,
CALIBRATION

1999-2000 NCBA Budget

Item Description	Year 98/99	Year 99/00 (Request)
NCBA Scholarship	250.00	250.00
Struthers Award of Excellence	181.10	250.00
Mailings/Printing/Postage	1076.78	1300.00
Legal filing fees	60.00	60.00
Website	410.00	410.00
Misc. discretionary	353.95	500.00
Developing Countries	1500.00	?
P.O. Box	44.00	44.00
Laptop	N/A	N/A
Total	3875.83	2814.00

Annual Seminar

Facilities Costs	4708.48	2700.00
Food	IN ABOVE	4500.00
Entertainment (Social Event)	IN ABOVE	100.00
Speaker Fee	194.74	2000.00
Prizes-drawings-giveaways	220.84	250.00
Mailings/printing/postage	545.08	500.00
Misc. discretionary	825.36	500.00
Total	6494.50	10550.00
Balance as of 9/5/1999		4564.23





Struthers Award of Excellence

Nominations for the 2000 "Struthers Award of Excellence" are now being taken. The award will be presented at the 7th annual NCBA seminar September 8th 2000.

Nominees must have demonstrated devoted leadership and service to the Biomedical community. Giving time, energy and availability to insure the growth and development of not only to there immediate surroundings but to the entire Biomedical community. This individual will have demonstrated strong ethics and character in their day to day actions.

If you are interested in nominating someone for the "Struthers Award of Excellence" please submit the following information:

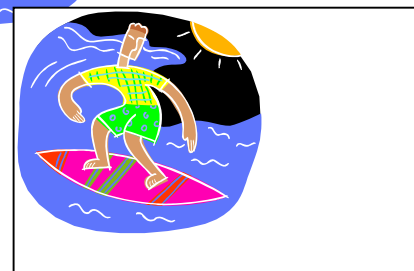
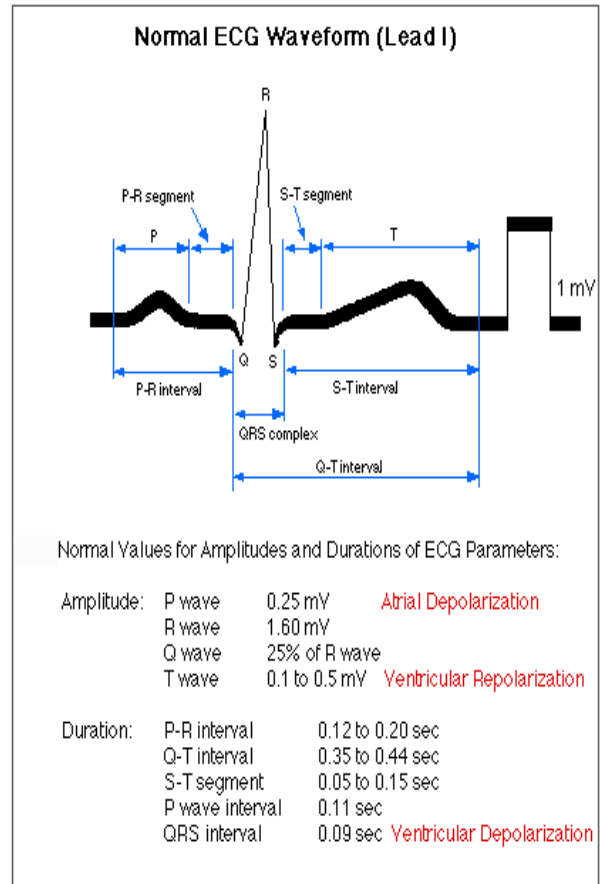
1. The name, address, phone number and employers name of your nominee.
2. Why you feel this person deserves this award.
3. Some examples of how they have meet the criteria. Your name, address, phone number, and employers name.

To: Attn. Ken Erickson

North Central Biomedical Association
 PO Box 141073
 Minneapolis, MN 55414
 Attn: Struthers Award

The information will be reviewed by the "Award Committee"

***Did you know the NCBA has a website?
 Check it out at www.ncbiomed.org***



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NORTH CENTRAL BIOMEDICAL ASSOCIATION
PREAMBLE

We are the North Central Biomedical Association, providing a forum for medical professionals on the Biomedical Engineering and Technician levels, who are involved with Biomedical equipment management. We strive to promote cooperation, education, formal/informal exchange of ideas and technical information related to the Health Care Industry. Thus, helping to assure quality patient care and cost effectiveness for the Health Care provider.

2000 Officers of NCBA

President-Ken Erickson, CBET
Hennepin Co. Medical Center
(612) 347-3389
president@ncbiomed.org

Vice President - Dean Ceminsky
St. Joseph's Medical Center
(218) 828-7324
vice-president@ncbiomed.org

Secretary-Jennifer Kriske, CBET
Miller-Dwan Medical Ctr.
(218) 720-1379
secretary@ncbiomed.org

Treasurer-Nancy Thomas
HealthEast Biomedical Serv.
(651) 232-2938
treasurer@ncbiomed.org

Membership is open to all persons that have an interest in Biomedical devices.
Membership dues are: \$15/year/individual membership.

MEMBERSHIP APPLICATION
(complete and return along with your payment)

Name: _____ Dept/Title _____

Facility/Organization _____

Mailing Address _____

E-mail Address _____ Phone(____)____ - ____ Fax(____)____ - ____

Would you prefer to receive your NCBA Newsletter : (check one)

By regular mail

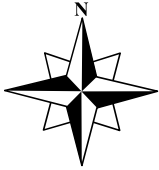
Notified by E-mail. (include your E-mail address above.)

You will receive an E-mail notifying you when the Newsletter is posted on our website.

◆ Make Check or money order payable to: North Central Biomedical Association, and send to

NCBA, PO Box 141073, Minneapolis MN 55114

North Central Biomedical Association
PO Box 141073
Minneapolis, MN 55414



(Address Label)



IN THIS ISSUE OF **THE INTERMITTENT SHORT**

- The Spring Quarterly Meeting
- Scholarship Application
- Presidents Letter

Technology Corner

Biphasic Defibrillation

External defibrillators deliver a brief but intense pulse of electrical current through the patient's chest through hand-held paddles or adhesive electrodes.

The term defibrillation waveform refers to the temporal shape of these pulses, i.e., the way the amplitude of electrical current and voltage varies over time during delivery of the pulse. Waveform shape is influenced both by the electronic circuit that generates it and by the resistance of the patient's chest to current flow. The waveform is of particular interest because hearts respond differently to different defibrillation waveforms.

Classification of defibrillation waveforms

Defibrillation waveforms are classified by the type of circuit used for their generation.

Truncated exponential waveforms are generated by discharging the energy stored in a capacitor through the patient and abruptly stopping current flow before the discharge is complete. These waveforms rise quickly to a sharp peak, decay slowly, then drop suddenly to zero. Damped sine waveforms, generated by discharging a capacitor through an inductor and the patient, are characterized by a rounded shape.

Waveforms are further classified by the number of *phases* comprising the shock. Shocks in which the current flows only in one direction, from one electrode to the other, are classified as monophasic. Shocks in which the direction of current flow is reversed part way through are classified as biphasic.

On a waveform graph, a biphasic waveform has one phase above zero and one phase below zero.

Combining these classifications gives us four categories: monophasic damped sine, biphasic damped sine, monophasic truncated exponential and biphasic truncated exponential (BTE) waveforms. Additional detail is necessary to completely specify the shape.

Waveforms in today's defibrillators

External defibrillators available in the U.S. generally deliver monophasic truncated exponential or monophasic damped sine shocks with maximum energy of about 360J. Several varieties of damped sine waveforms are used, including Edmark, Lown, and Pantridge waveforms. These varieties differ in their amount of *damping*, that is, how quickly the current settles back to zero after its initial peak. For patients with typical transthoracic impedance, these waveforms are monophasic; for patients with low impedance they can have a small second phase. Researchers in the former Soviet Union have advocated the use of biphasic waveforms since the 1940s, although they have never published clinical comparisons of monophasic and biphasic waveforms. Biphasic damped sine defibrillators have been manufactured there for many years; manufacture of BTE defibrillators began several years ago.

All implantable cardioverter defibrillators (ICDs) used monophasic truncated exponential waveforms until a few years ago, but biphasic ICDs are now much more

popular. This transition occurred because biphasic waveforms made it possible to treat more of the patients needing implants with leads which didn't require open chest surgery.

Biphasic waveform research

The relationship between the shape and efficacy of various defibrillation waveforms has been studied by scientists for more than three decades in cell layers, isolated hearts, animals and humans. Much of this research has been tailored to the questions relevant to implantable defibrillators.

Two large clinical studies have recently provided the first comparison, *in humans*, of external defibrillation with conventional monophasic shocks and experimental biphasic shocks. Because these studies tested unproven waveforms, they were conducted under close physician supervision in the safe, controlled settings of the electrophysiology laboratory and the O.R. Ventricular arrhythmias were induced by small electrical shocks delivered directly to the heart. The defibrillation shock was delivered a few (usually less than 20) seconds after appearance of "shockable" ventricular arrhythmias.

In the first of these studies 7 defibrillators were modified to randomize delivery of two types of shocks: 200J standard and 200J biphasic damped sine. The study showed that single biphasic shocks defibrillated or cardioverted 13% more frequently than single conventional monophasic shocks. In the group in which ventricular fibrillation was the rhythm shocked, single conventional shocks

defibrillated 79% of the time whereas single biphasic shocks of the same energy defibrillated 100% of the time.

Even while this study was being conducted, a group of scientists searched intently for a better biphasic waveform. In 1991 and 1992, they conducted an extensive series of animal experiments examining how details of the shape of the BTE waveforms affected the ability of those waveforms to defibrillate. They gathered the data needed to select the best duration for BTE shocks, and the best ratio for the durations of the first and second phases. From these studies, specific BTE waveforms were identified that worked well and could be implemented into smaller, lighter defibrillators. The information led to an ongoing clinical study and product development work.

A second large clinical comparison was presented in 1996 and published in abstract form (GH Bardy et. al., *PACE* 19:678). In this study, external defibrillation success rates were measured for 115 and 130J BTE shocks, and for 200 and 360J monophasic damped sine shocks. Measured single shock defibrillation rates were 89%, 86%, 86% and 96%, respectively. Defibrillation rates for 130J BTE and 200J monophasic shocks were found to be statistically equivalent. The study indicated the defibrillation rate difference between 130J BTE and 360J monophasic was inconclusive.

