

# THE CUTTING EDGE

## REGION IX NEWSLETTER



WINTER NEWSLETTER ~ FEBRUARY 2007

### Greetings from the Region IX Director Heather Nymeyer

This has been a very busy few months, learning all the different duties with being the Regional Director. I can honestly say initially that I have found this to be a very steep learning curve but finally after 2 months I have reached a plateau.

The fall newsletter was my first priority once I returned from Phoenix and it did not take me long to realize that the publication of the newsletter takes some skills and timing. I can not describe to you the satisfaction I felt after the first newsletter was formatted, printed and sent out to all the members. The Winter newsletter was easier to assemble and this was because of the positive responses I received after the Fall newsletter was published and all the different individuals that contributed puzzles, announcements and the featured articles for this publication. If you would like to contribute an article, puzzle, or a meeting announcement, please submit these to myself or Mark Elliott. If for some reason you did not receive this newsletter, please contact me at [heather@nshregionix.org](mailto:heather@nshregionix.org) or you can also find it posted on the Region IX website at [www.nshregionix.org](http://www.nshregionix.org).

In addition to the Fall newsletter that had to be sent out, October was time to finalize the last details for our Educational Symposium in Vancouver, co-hosted with Vision BioSystems. I was very fortunate to have a strong team of Rose Clarke and Mark Elliott who had completed many of the necessary details prior to the S/C. Mark and I basically had only to finalize the caterer, venue, and advertising and obtain the necessary insurance coverage. Mark certainly had the largest number of tasks to complete. I am proud to say that this event was a huge success. The Education committee is now in the process of organizing an Educational event for Calgary in June 2007. More details will be available in this newsletter and on our website ([www.nshregionix.org](http://www.nshregionix.org)).

Since this is the first newsletter for 2007, your Region IX Executive members would like to extend their best wishes to all its members in 2007.

### NSH Region IX Education Day Calgary, Alberta June 8 – 9 . 2007



Calgary is an attractive and dynamic city that is situated on the banks of the Bow River and a short driving distance from the beautiful Rocky Mountains. Calgary is famous for its annual stampede that attracts millions of spectators and some of the best rodeo champions in North America. Calgary is home of the NHL Calgary Flames and has hosted such events as the 1988 Winter Olympics. This beautiful city seemed the ideal setting for Region IX's next Education event.

The Education Day will be held at the Southern Alberta Institute of Technology (SAIT) on June 8-9, 2007. This will be Region IX's first time hosting a one and a half day event and the Educational Committee members look forward to providing the participants with a list of high quality speakers and great topics. The Education Committee is hoping to provide simultaneous Histology and Cytology seminars during this time to meet the requests of its membership. The Educational Committee is also hoping that this event will attract not only our Canadian histology and cytology colleagues but also our American neighbors.

Visit our website (<http://www.nshregionix.org>) in early 2007 for more details for this event and this website will be updated on a regular basis as more information becomes available. (Click on Education button). We look forward to seeing everyone in Calgary.

## Education Update

*Mark Elliott-Education Chair*

Happy New Year to you all and I hope you had a great holiday season. As you have seen on the front page of the newsletter, we are gearing up for our next Region IX Education Day to be held June 8 and 9<sup>th</sup> at SAIT in Calgary. In response to comments made by both vendors and attendees at the events held in Vancouver and Montreal, we decided to expand the program somewhat. We will now be starting Friday evening with a 'Wine and Cheese' reception which will allow attendees and vendors time to meet with one another without having to worry about when the next lecture will begin. There are currently 5 speakers scheduled to talk on Saturday, including Dr Peter Krein talking about Basic Molecular Biology and CISH/FISH, Dr Jim Farmilo discussing Molecular Profiling of Tumors with IHC, CISH and FISH, Joanne Luider on "What do they do in Flow Cytometry anyway", Dr Tony Magliocco on Breast Health and finally Dr Evan Matshes talking on Forensics. The vendors will still be available on Saturday throughout the day in order for attendees to meet with them during the breaks and we have 12+ vendors indicating their willingness to participate. There is talk as well of a possible reception/party Saturday evening but this still has to be confirmed. The response so far from vendors and histotechs has been terrific and the event looks like it will be another stellar success. As indicated on the front page, we were hoping to include concurrent sessions for our Cytology colleagues, however the Education Day follows closely the International Cytology Conference being held in Vancouver in May and it was felt by the cytotechs that it was not feasible at this time. We will look into this collaboration for future events however. Please keep checking the Region IX Website as further information, as well as registration forms etc, will be posted shortly, if not by the time you receive this newsletter. There has even been a block of rooms set aside for attendees at The Hampton Inn & Suites. Further information on hotels will be on the registration forms. I would like to give a big thanks to Sandra Eyton-Jones and Carol Leriger for doing a lot of the leg-work for me in Calgary. They have a small committee that has been busy suggesting speakers and locations etc. It is difficult at times trying to organize a meeting long distance and they have been terrific. This would not have been possible without their help. Neil Abhyankar from Surgipath has also been a help, especially in finding hotel accommodations.

**Mark Elliott** [mark@nshregionix.org](mailto:mark@nshregionix.org)

Region IX Education Committee, Chair

## Education Calendar

### Region IX Calgary Education Event

June 8-9, 2007

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### NSH Teleconference Schedule

[www.nsh.org](http://www.nsh.org)

- **Tissue Identification for the Histotech**  
Date: February 28, 2007  
Time: 1:00pm EST  
Presented by Thomas S. Haas, D.O., F.C.A.P., Mercy Health Systems, Janesville, WI
- **IHC Cross-Reactivity and Detection Systems for Animal Tissue**  
Date: March 28, 2007  
Time: 1:00pm EST  
Presented by Elizabeth Chlipala, HTL(ASCP)QIHC, Premier Laboratory, University of Colorado Boulder, Boulder, CO
- **Introduction to Polymerase Chain Reaction (PCR) Assays with Applications to Solid Tumor Analysis**  
Date: April 25, 2007  
Time: 1:00pm EST  
Presented by Susan Hunter, SI(ASCP)MP, William Beaumont Hospital, Royal Oak, MI
- **Implementing the Six Sigma Process: A Case Study**  
Date: May 23, 2007  
Time: 1:00pm EST  
Presented by Bill DeSalvo, HTL(ASCP) and Kathleen Davis, HT(ASCP)HTL, Sonora Quest Laboratories, Tempe, AZ



**Vancouver Educational Symposia**  
**"Advancing the Science of Histology"**  
**Location: St Paul's Hospital, Vancouver, BC**  
**Date: Saturday October 21, 2006 9am – 5pm**  
**By Helen Palmer**

Vision BioSystems partnered together with NSH Region IX to provide educational training to the Pathology community in Vancouver, BC. The event entitled "Advancing the Science of Histology" was Vision BioSystems inaugural Symposia in a series of educational symposia designed to partner with local NSH societies to bring education and learning to Histotechs worldwide. With almost 60 participants in attendance (including Histotechs and Pathologists alike) the event was well attended and the local Pathology community well represented. The focal point of the symposia was to introduce the concept of lean processing and workflow efficiency improvements which is a subject many of today's HistoPathology labs are clamoring for.

Educational presentations were incorporated into a live wet workshop to demonstrate improved workflow efficiencies and same day processing capabilities in today's histology/immunopathology lab. Tissues from on sight at St. Paul's were processed, cut, stained and read all on the same day utilizing Vision BioSystem's Peloris and Bond MaX. Keith Miller, Director NEQAS and University College London's ImmunoPathology Lab was the Key Note speaker and spoke on the Diagnostic, Prognostic and Predictive value of IHC and FISH/CISH in today's lab. Other presentations included: "Optimizing Tissue Processing", "IHC and ISH: Maximizing Quality and Workflow", and "An Introduction to Chromogenic In Situ Hybridization (CISH)".

### ***Outcome and Feedback***

A total of 4 contact hours was awarded for the entire Symposia and the general feedback from participants can be summarized in the bullet points below. Responses were overwhelmingly positive with comments such as these from attendees:

- ✚ "Same Day turn around time begins with Tissue Processing" - Excellent topic!
- ✚ CISH – great topic; very up to date and current in the field
- ✚ Great job with short time to present; Lots of information covered in a relatively quick period of time
- ✚ Excellent!

Feedback on Keith Miller's Presentation, specifically:

- ✚ Great presentation
- ✚ Keith is very knowledgeable and experienced
- ✚ Could spend hours listening to Keith
- ✚ Keith is very informative with an unbiased opinion
- ✚ Keith Miller was the draw for this event

Vision BioSystems is very pleased for the success of this event and for the opportunity to help provide educational and learning tools to the local Histotech society and is very grateful to the Region IX NSH members for their involvement and collaboration to make this event possible.

We look forward to future educational partnership opportunities with Region IX NSH and hope to see many of you at the Educational Day in Calgary in June 2006!

## Message from NSH regarding Contact Hours

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Dear State President:

Hello from NSH HQ!

It has come to our attention that the report used to create the summary contact hour certificates for 2006 was incorrectly calculating any workshop that was given partial hour credit. For example a workshop worth 1.5 hours was calculating as 2 hours (in each instance the hours were rounding up). We have determined that this impacted fourteen meetings - your 2006 state meeting(s) is included on this list.

We have reprinted corrected certificates for those participants and they went in the mail today. The certificates include a letter explaining the error but I wanted to give you a heads up in case you are contacted by registrants to those meetings.

If you have any questions please feel free to give me a call at the office.

Thanks,  
Aubrey

### **Mrs. Aubrey M.J. Wanner**

Meeting Manager, Annual  
Symposium/Convention  
Managing Editor, *Journal of Histotechnology*  
National Society for Histotechnology  
4201 Northview Drive | Suite 502  
Bowie, MD 20716  
P | 301.262.6221 x.18  
F | 301.262.9188  
<http://www.nsh.org/>

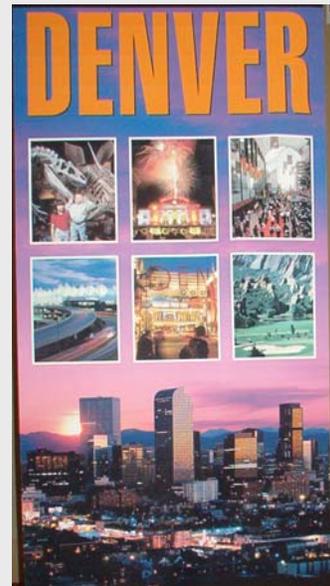
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**NSH S/C  
Future Dates**

**33rd Annual Symposium/Convention**

**October 26-31, 2007 in Denver, CO**

**April 1, 2007 Registration starts**  
Check [www.nsh.org](http://www.nsh.org) for complete symposium  
information



**34th Annual Symposium/Convention**  
September 12-18, 2008 in Pittsburgh, PA

**35th Annual Symposium/Convention**  
October 3-8, 2009 in Birmingham, AL

**36th Annual Symposium/Convention**  
2010 ~ Seattle, WA

**37th Annual Symposium/Convention**  
2011 ~ Cincinnati, OH

**38th Annual Symposium/Convention**  
2012 ~ Vancouver, BC Canada

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## NEWSFLASH!!

The Region IX Awards Committee is very proud to announce four new awards for Region IX members!!

### **Dako Immunohistochemistry Award**

Sponsored by Dako Canada Inc.

**Award Amount: \$1,000.00**

### **Ventana Medical Systems Immunohistochemistry Award**

Sponsored by Ventana Medical Systems Inc – Canada

**Award Amount: \$500.00**

### **Vision BioSystems Immunohistochemistry Award**

Sponsored by Vision BioSystems – Canada

**Award Amount: \$500.00**

### **Newsletter Contributor Award**

Sponsored by Creative Waste Solutions Inc

**Award Amount: \$300.00**

This award will be in recognition of a Region IX member who has contributed significantly to *The Cutting Edge* newsletter. The Awards Committee will try to solicit a sponsor for this award.

The Region IX Awards committee encourages you and your colleagues to consider applying for any or all of our new or existing awards. They are a great opportunity to help with continuing education or offset travel expenses associated with attending a NSH convention. Award criteria for the new awards will be announced in the Spring Newsletter. Application deadline: July 31<sup>st</sup>

**Please make this one of your New Year's resolutions and download the application today from our Region IX website:**

<http://nshregionix.org/awards.html>

**Other Region IX Awards Available ~ Deadline Date for application: July 31<sup>st</sup>.**

**Student Scholarship award (\$1,000.00) - <http://www.nshregionix.org/studentachievementaward.pdf>**

**Surgipath Award of Excellence (\$1,000.00) - <http://www.nshregionix.org/surgipathaward2.pdf>**

**Malcolm D. Silver Award (up to \$1,000.00) - <http://www.nshregionix.org/malcolmsilveraward2.pdf>**

**Vendor Plaque of Appreciation: Recognition Plaque - <http://www.nshregionix.org/vendoraward.pdf>**

**Don't forget to check the NSH website for other awards**

[www.nsh.org](http://www.nsh.org) - click on Awards & Scholarships

**Deadline date for application for NSH awards – May 1, 2007**

Please feel free to e-mail any of us ~ Region IX Awards committee:

Rose Clarke – [rose@nshregionix.org](mailto:rose@nshregionix.org)

Tracey Lenek – [tracey@nshregionix.org](mailto:tracey@nshregionix.org)

Teresa Estioko – [Teresa@nshregionix.org](mailto:Teresa@nshregionix.org)



## Canadian novelist tackles contentious New York history

### David More's first novel already winning kudos

KINGSTON, ON. August 4, 2006 — “Make way for a splendid new voice on the Canadian literary scene.” That is one early reviewer’s comment on a first novel by David More. Called *The Eastern Door*, this historical saga follows a transplanted Irishman into the 18<sup>th</sup> century wilderness of the New York frontier, befriended by England’s Mohawk allies, and dogged by a vengeful boyhood antagonist. The novel is published by iUniverse Inc. of Nebraska

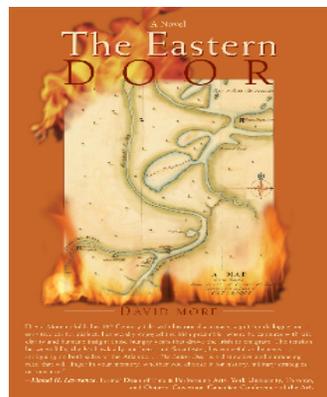
David More, who manages the Pathology Services and Outreach labs at Kingston General Hospital, has had articles published in several Canadian newspapers and health care journals, but *The Eastern Door* is his first novel.

*The Eastern Door* became available August 4 on-line from [www.iUniverse.com](http://www.iUniverse.com) (\$19.95 US plus shipping). It is e-marketed through Chapters/Indigo on-line, Barnes & Noble, Amazon.com, and ALibris and is on sale at Novel Idea in Kingston (\$24.00).

Reviewer Lionel H. Lawrence (former Dean, York University) calls *The Eastern Door* “a distinctive and entrancing read that will linger in your memory, whether you choose it for history, military strategies or romance.”

Many of Dave More’s colleagues know that history is his avocation. *The Eastern Door* took more than five years of research and writing as he became increasingly excited by the colourful stories he was unearthing, stories never told in Canadian history classes.

For more details, see the writer’s web site: [www.davidmore.ca](http://www.davidmore.ca) Dave would also welcome comments on his novel at [dmore1@cogeco.ca](mailto:dmore1@cogeco.ca).



Permission for reprinting given by David More

**The Safety Corner**

by Heather Nymeyer, RT, CEBT

**WHMIS SYMBOLS – Part 2**

WHMIS requires all chemicals or hazardous materials to be classified before being distributed. There are 6 classifications with each class having a specific symbol to identify the hazard.

Class A – Compressed Gas

This includes any material that is normally a gas and is placed under pressure and is usually found in a cylinder. These products are considered dangerous because they are under pressure and heating or damage to the cylinder can result in the cylinder exploding or becoming a “torpedo”. Most common gases include: oxygen, compressed air, propane.

Class B – Flammable and Combustible Material

Within this class there are 6 sub-divisions and they are:

- Division 1: Flammable Gas
- Division 2: Flammable Liquid
- Division 3: Combustible Liquid
- Division 4: Flammable Solid
- Division 5: Flammable Aerosol
- Division 6: Reactive Flammable Material



*Flammable* refers to material that will burn or catch on fire at normal temperatures below 37.8°C or 100° F.

*Combustible* refers to material that usually is heated before they catch on fire. Usually this occurs at temperatures above 37.8°C or 100° F or 98.3°C or 200° F.

*Reactive Flammable* materials are those that suddenly start burning or may produce a flammable gas when exposed or come in contact to air or water.

Some examples include propane, acetone, ethanol, toluene, varnishes.

Class C – Oxidizing Material

Oxidizing chemicals do not usually burn themselves but they can cause other materials to burn by supplying oxygen. Oxidizers can be in the form of gases, liquids or solids. Some examples of oxidizing chemicals include nitric acid, perchloric acid solutions, oxygen, potassium permanganate and sodium chlorite.

Class D – Poisonous and Infectious Material

The material found in this class is defined as material that will cause immediate and serious effect. There are three divisions in the classification.

Class D-1: Materials causing Immediate and Serious Toxic Effects. These include materials that are very poisonous and will cause immediate danger or death to an individual when exposed to small amounts. Long term effects to an individual's health may persist for months to years. Some examples include carbon monoxide, sodium cyanide, sulphuric acid, toluene.



Class D-2: Poisonous and Infectious Material. This class of materials are also poisonous but their effects are not as immediate and are usually only temporary compared to those materials found in Class D-1. The effects of material in this class may still include cancer, allergies, reproductive problems or irritation from exposure to small amounts for long periods of time. Some examples of material within this class include asbestos, mercury, benzene, acetone and lead.



Class D-3: Biohazardous Infectious Material. This classification includes organisms or toxins that can cause diseases in people or animals. They include viruses, bacteria, fungi and parasites. Some examples of biohazards include Hepatitis B, salmonella, AIDS/HIV virus.



Class E – Corrosive Material

Materials found under this classification are considered corrosive and can cause severe burns to human tissues or clothes when contact occurs. Some examples of corrosive material include sulphuric and nitric acids, ammonium hydroxide caustic soda, ammonia gas, chlorine and nitrogen dioxide.



Class F – Dangerously Reactive Material

The material classified under this class include those that

- 1) react very quickly and strongly with water to form a toxic gas
- 2) react with itself when it is bumped or dropped or when the temperature or pressure it is used in changes
- 3) react with itself to change composition by either polymerization, decomposition or by the loss of extra water (condensation).



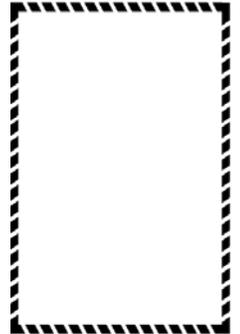
This classification of material is very dangerous because they have a tendency to react quickly and very easily. Some examples include ethyl acrylate, ethylene oxide, picric acid and anhydrous aluminum chloride.

## Labels

### WHMIS labels

In Canada suppliers are required to label all controlled products sold or imported both in French and English and within a hatched border label. The information contained within this label should include:

- Product name
- Hazard symbols
- Risk phrases
- Precautionary measures
- First aid measures
- Supplier Identifier
- Reference to MSDS



### Workplace Labels

There is a bit more flexibility with workplace labels but laboratories should check their local regulations.

Workplace labels should contain three pieces of information on each label:

- Product identifier
- Specific safe handling information (this would include personal protective clothing and equipment required)
- Reference to the MSDS if one is supplied by the producer.

For more information on WHMIS classifications, visit the following websites:

[www.nsh.org](http://www.nsh.org)

[www.ccohs.ca](http://www.ccohs.ca)

[www.hc-sc.gc.ca](http://www.hc-sc.gc.ca)

[www.hrsdc.gc.ca](http://www.hrsdc.gc.ca)

[www.worksafebc.com](http://www.worksafebc.com)



**NSH Region IX would like to thank Surgipath Canada for their continued sponsorship of *The Cutting Edge Newsletter*.**

## **Ready, Set, Apply for 2007 NSH Awards**

I am energetically beginning my 2<sup>nd</sup> year as the National Society of Histotechnology (NSH) Awards Chairperson and would like to share this energy with each state and their membership by promoting the NSH awards program to all of you! NSH annually offers \$36,000 in awards and scholarships to its membership and as an NSH member the awards and scholarship program is a benefit you should seriously consider taking full advantage of. NSH offers awards and scholarships for students, advanced education, foreign travel, IHC, In-Situ Hybridization, microwave, hard tissue, management, teaching, best newsletter, best website, along with outstanding dedication and service to the field of histotechnology. The criteria and application for each award is listed on the NSH website: [www.nsh.org](http://www.nsh.org) → Awards and Scholarships. You can definitely apply for the offered awards for yourself or if do not care to personally apply, how about submitting award/scholarship application(s) for:

1. A well deserving co-worker?
2. Your laboratory manager?
3. A fellow histologist that has no funding to attend meetings?
4. Your state president?
5. One of your states board members?
6. Your hard working histology student?
7. Your diligent histology instructor?
8. Your unsung newsletter editor?
9. The person(s) that organizes your state/regional meeting year after year?
10. Your region director?
11. Yourself? Yes you do deserve to be recognized with an NSH award – APPLY.

Think of all the histotechnologists that you know that are deserving and worthy of NSH recognition and the financial benefit of an NSH award/scholarship. Please take the time to review the criteria, complete the application(s) and apply for an award/scholarship for yourself or for a well deserving fellow histotechnologist! May 1, 2007 is this year's deadline for submitting applications for NSH Awards and Scholarships that will be presented at the NSH Symposium/Convention, Awards Banquet, October 28, 2007 in Denver, Colorado.

I would be thrilled to see each state have multiple applications for multiple NSH awards/scholarships in 2007. Please feel free to contact me with any questions concerning NSH awards and scholarships that you may have. Good Luck!!

Jean Mitchell, BS, HT (ASCP)  
National Society of Histotechnology Awards Chairperson  
[jmitchell@uwhealth.org](mailto:jmitchell@uwhealth.org)  
608-263-9184  
608-263-0412 (fax)

## IMMUNO HISTO-SEARCH

Submitted by May Chin

R S E P N R T E G L S E P B T  
 O V C E D N N E S S G D L A N  
 T E H G N T A C D I D L B C I  
 P O R G O A K N S E E I E G A  
 E L O D N O L P E C S M H R M  
 C N M N D R P L T Y M N A R I  
 E A O I S C S A H E I N N E E  
 R E G R O L S P C M N N R E P  
 N I R E E M O P M S I E P B S  
 E M A H A T O A A T T S M I R  
 G G N D P L S K N H A M A C R  
 O S I A B L L E C B R A R N I  
 R P N C R M M G G N E A P R P  
 T Y R E N I A E E O K S N E I  
 S C N C V A N L R A R R S S C  
 E A I N E R I A A I L P S P E

KERATIN	PSA	TCELL
PROGESTERONE	ESTROGENRECEPTOR	BCELL
KAPPA	LAMBDA	SMA
MSA	DESMIN	ECADHERIN
SYNAPTOPHYSIN	VIMENTIN	AMACR
CHROMOGRANIN	EMA	HCG
LCA	NSE	PLAP

Histo – Search answer page 12

## Region IX Bylaws Article VIII Amendments

The bylaws may be amended at the annual business meeting by a two-thirds vote of the members present or voting by absentee ballot, providing the proposed amendments have been submitted to executive, and subsequently mailed to members at least two weeks prior

THE CUTTING EDGE is the official newsletter of Region IX of the National Society for Histotechnology. It is distributed quarterly to 350 members in Canada.



### The Objectives of THE CUTTING EDGE are to:

- Reflect both Canadian and North American articles pertinent to the practice of Histotechnology
- Publish articles that are beneficial to our discipline.
- Promote communication between Region IX members and members of the other NSH Regions
- Provide a medium for exchange of information among members.

*Contributions are welcome.*  
Please send your articles to:

**Heather Nymeyer, RT, CEBT**  
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 Royal Inland Hospital  
 311 Columbia St.  
 Kamloops, BC V2C 3B9  
 Tel: 250-314-2664  
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**W. Mark Elliott Ph.D.**  
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*Production of The Cutting Edge is sponsored by Surgipath Canada Inc.*

[www.nshregionix.org](http://www.nshregionix.org)

**Newsletter Submissions  
can be sent to**  
[heather@nshregionix.org](mailto:heather@nshregionix.org) or  
[mark@nshregionix.org](mailto:mark@nshregionix.org)



[www.nsh.org](http://www.nsh.org)

**NSH**

### MISSION STATEMENT

*The National Society for Histotechnology is a non-profit organization, committed to the advancement of Histotechnology, its practitioners and quality standards of practice through leadership, education and advocacy.*

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### Histo – Search Solution

R	S	E	P	N	R	T	E	G	L	S	E	P	B	T
O	V	C	E	D	N	N	E	S	S	G	D	L	A	N
T	E	H	G	N	T	A	C	D	I	D	L	N	C	I
P	O	R	G	O	A	K	N	S	E	E	I	E	G	A
E	L	O	D	N	O	L	P	E	C	S	M	H	R	M
C	N	M	N	D	R	P	L	T	Y	M	N	A	R	I
E	A	O	I	S	C	S	A	H	E	I	N	N	E	E
R	E	G	R	O	L	S	P	C	M	N	N	R	E	P
N	I	R	E	E	M	O	P	M	S	I	E	P	B	S
E	M	A	H	A	T	O	A	A	T	T	S	M	I	R
G	G	N	D	P	L	S	K	N	H	A	M	A	C	R
O	S	I	A	B	L	L	E	C	B	R	A	R	N	I
R	P	N	C	R	M	M	G	G	N	E	A	P	R	P
T	Y	R	E	N	I	A	E	E	O	K	S	N	E	I
S	C	N	C	V	A	N	L	R	A	R	R	S	S	C
E	A	I	N	E	R	I	A	A	I	L	P	S	P	E

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### Region IX Executive Committee

**Heather Nymeyer**  
[Heather@nshregionix.org](mailto:Heather@nshregionix.org)  
Director

**Rose Clarke**  
[Rose@nshregionix.org](mailto:Rose@nshregionix.org)  
Past Region IX Director

**Michele Shackleton**  
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Treasurer

**Linda Rollins**  
[Linda@nshregionix.org](mailto:Linda@nshregionix.org)  
Secretary

**Michael Ho**  
[Michael@nshregionix.org](mailto:Michael@nshregionix.org)  
Member at Large

#### Sub Committees

**Rose Clarke**  
[Rose@nshregionix.org](mailto:Rose@nshregionix.org)  
Awards Committee, Chair

**Teresa Estioko-Timuri**  
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Award Committee, Co-Chair

**Mark Elliott**  
[mark@nshregionix.org](mailto:mark@nshregionix.org)  
Education Committee, Chair

**Tom Wells**  
[tom@nshregionix.org](mailto:tom@nshregionix.org)  
Membership, Chair

#### Region IX Committee Members Serving on Other NSH Committees

**Janet Tunnicliffe**  
[janet@nshregionix.org](mailto:janet@nshregionix.org)  
NSH Vice President

**Nominations and Elections, Chair**  
**Kevin Gibbon**  
[Kevin@nshregionix.org](mailto:Kevin@nshregionix.org)

**Bylaws Committee**  
**Mark Elliott**  
[mark@nshregionix.org](mailto:mark@nshregionix.org)

**Region IX Website:**  
[www.nshregionix.org](http://www.nshregionix.org)

## The Human Spine – Anatomy & Function

Vicki L. Kalscheur, HT (ASCP)

Angela L. Elwell

Comparative Orthopaedic Research Laboratory

University of Wisconsin, School of Veterinary Medicine

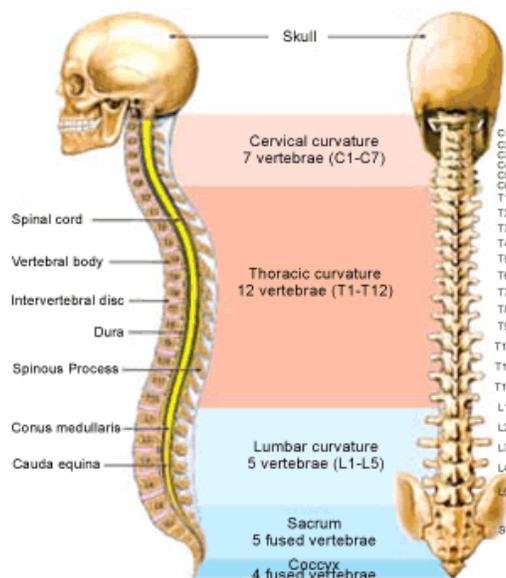
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Back pain is a universal problem: An estimated 8 out of 10 Americans will suffer from back pain at some point during their lifetime. Aching backs cost the American economy between \$15 billion and \$30 billion a year from lost time at work and extra health care costs.

The human spine consists of the skull, 24 separate vertebrae (small back bones), and the sacrum and coccyx (tail bone). The spine supports the body and absorbs the shocks of everyday activities. There are at least two joints between every bone in the spine, with each joint surrounded by a sealed (to air and liquid) capsule consisting of flexible connective tissue. The capsule contains synovial fluid, which lubricates and provides nutrients to joint cartilage.

Anatomy of the back: The spine is not straight! It consists of four continuous curves from head to tail, the cervical, thoracic, lumbar and sacral pelvic, respectively. These curves allow the body to be flexible and absorb shock from everyday and strenuous activities. The structure of the spine is formed by the vertebrae, intervertebral discs, and ligaments. Muscles surrounding the spine provide support for this structure and joints between vertebrae provide mobility. Discs are located between vertebrae and are the primary components of the spine that provide flexibility and act as shock absorbers. In the center of the disc is a jelly-like material and is the substance that enables the discs to be shock absorbing. Surrounding the disc is a tough rubber-like band that is attached to the bones that enables the disc to make the spine flexible. Unlike other cellular components of the body, discs do not circulate blood through veins or arteries. The discs obtain their nutrients through fluid circulation that “flows” in as the back moves. Sitting sedentary does not promote this fluid circulation. Being active will enable nutrients moving in and waste moving out which reduces the chance of discs losing their strength over time. Movement, moderate exercise and more are essential.



Purpose of the spine: Our spine is designed for three purposes: to protect the nervous system (spinal cord), act as a shock absorber, and maintain the structure of our torso while allowing for body mobility. Back problems occur when the spine is misused. The most common back disorders are disc strain or bulge, disc herniation, sprains and strains (acute or chronic), and muscle injury and spasm.

Most of the body's weight and stress falls on the lumbar vertebrae. Too much desk sitting puts pressure on the lumbar disc, in the lower back, creating problems. Golf=twisting=lower back problems. Tennis and bowling can also be bad for the back. What happens is alignment and balance shift. A heavy backpack, being overweight, pregnancy, for example, can shift the center of balance, therefore increasing the stress of the joints of the back. Then the accumulated muscle tension starts and builds.



So you did it – muscle inflammation hurts. I find it helpful to treat my lower back “new injuries” with ice 15-20 minutes, several times a day. IT is best to avoid resting on the couch too long. Taking a walk can actually be more helpful than bed rest. A combination of rest, walking, stretching, and low impact fitness are also helpful. However, there are situations that require more attention.

- Disc Diseases: Degeneration of discs with age. This can be painful because a herniated or “slipped” disc bulges out or gets dislodged from between the vertebrae and pushes on the nerve roots.
- Arthritis: Inflammation of the joints. The most widespread form is degeneration of vertebral joints as the body ages. This can be very painful.
- Injuries: Muscles, ligaments, and bones of the back can be pulled, sprained, torn, or fractured. The best way to avoid injury is by stretching before sports or heavy labor and learning to lift heavy objects the correct way.

Back problem *non-surgical solutions* can start with physical therapy and medications. If one needs surgery, the methodology has dramatically improved over the years. Researchers at the University of Wisconsin-Madison Clinical Science Center and the School of Veterinary Medicine have collaborated on a number of spinal related projects that will benefit many of us. The goat/sheep model surgeries are performed in the veterinary school, using bone substitutes (plates-pins-polymers) and less invasive methods. For my undecalcified bone specialty, I use several methods for plastic embedded and sectioned bone that provide histology slides to look at implants or discs where mineralization, bone formation, and bone architecture is evaluated.

From my reading, I have found advances and options for human spine surgery methods to correct damage to cartilage or discs between the bones of the spinal column.

- Use of Protein: A saturated sponge containing a bone-growth factor. A bone-growth factor is a substance that should produce bone growth to replace bone that was removed during spinal fusion surgery. Surgeons remove the bone of interest and cartilage and fuse adjacent vertebrae together. In the past, the bone that has been removed is replaced by bone fragments taken from other parts of the patient's body, usually the rib or pelvis. This newer surgical procedure eliminates the need for that secondary surgery. The sponge is fused with the Bone Morphogenic Proteins (BMPs) and is placed in a special cage that replaces the diseased disc. BMPs are an actual substance that the body produces when it is injured. The (special) cage is made of metal and maintains the space between two vertebrae and the protein “fuses” or seals the two bones together. The patient has no side effects from the use of BMPs to induce bone growth and the healing time is much shorter than the

traditional method (requiring 6 months). Additionally, BMPs are being used to treat bone fractures and dental conditions.

- Advances in Herniated Disc Repair: Advances have led to microsurgery or microdiscectomy, which is a procedure that can be done in about an hour. The patient goes home the same day. The surgeon makes a small incision and moves the disc to alleviate the pain from the pinched nerve. A magnifying glass or a surgical microscope is used to see the disc.
- Thermal Modification: Used to shrink collagen fibers and thermocoagulate nerve tissue for small tears in disc. This method gives back pain “relief” and eliminates the need for a spinal fusion. Thermal modification involves the use of radiofrequency (RF). The device uses radio waves to oscillate electrolytes in and around tissues.
- This generates enough heat to shrink collagen without excessive damage. The procedure is called intradiscal electrothermal annuloplasty (IDET). Treating one disc takes an hour and often with rest, the patient can go home. Patients return to work in 3-5 days post procedure, but do need a follow-up of low level exercise and physical therapy. Long term data is still being collected on this study.
- Gene Therapy: This method allows researchers to grow new disc tissue. Animal studies are currently in progress.

There are more options and advances in spinal surgery and research. Biotechnology continues to change and advance orthopedic options.

At every age, preventing back injuries makes sense. Maintain good posture, stay fit, avoid doing silly things that cause acute pain and start the inflammatory process. In regards to osteoporosis – understand the process that the load and weight bearing activities put on the bones. We can't prevent it, but we can certainly delay the process by eating well and participating in regular moderate physical fitness that will strengthen the muscles around your spine. Also, leg/shoulder strengthening is helpful in supporting your back.

Keep your back healthy – even though we may not feel a day over thirty – many of us are!!

For further information on human spine anatomy and function, the following references and Websites may be useful.

Websites:

North American Spine Society <[www.spine.org](http://www.spine.org)>

[www.back.com](http://www.back.com)

[www.back1.com](http://www.back1.com)

Human Anatomy Pictures and Medical Software <[www.human-anatomy.com](http://www.human-anatomy.com)>

Spine Institute of New York <[www.spineinstituteny.com](http://www.spineinstituteny.com)>

[www.spineuniverse.com](http://www.spineuniverse.com)

[www.spinaldisorders.com](http://www.spinaldisorders.com)

Journal of Spinal Disorders and Techniques <[www.jspinaldisorders.com](http://www.jspinaldisorders.com)>

Spine-Health <[www.spine-health.com](http://www.spine-health.com)>

[www.webmd.com](http://www.webmd.com)

[www.espine.com/diagnosis\\_lm.html](http://www.espine.com/diagnosis_lm.html)

## References:

Cooke ME, Kalscheur VL, Wilson DG, Zdeblick TA. Preparation of Large Calcified Bone Sections for Fluorescent Histomorphometry. *Journal of Histotechnology* Vol 22:2, June 1999.

Zdeblick TA, Abitbol J, Kunz DN, Eng M, McCabe RP, Garfin S. Cervical Stability After Sequential Capsule Resection. *Spine* 18 2005-2008; 1993

Hutton WC, Toribatake Y, Elmer WA, Ganey TM, Tomita K, Whitesides TE. The Effect of Compressive Force Applied to the Intervertebral Disc *In Vivo*: A Study of Proteoglycans and Collagen. *Spine* 23 2524-2537; 1998

Rosenfeld, Isadore. *Live Now, Age Later: Proven Ways to Slow Down the Clock*. Bridgewater, NJ: Replica Books, 1999

Haider, M. Learning Scope 2: Menopause, Hormones and Osteoporosis. *Advance/Laboratory* 9:2 64-67; 2000

Tarkan, L. Building Better Bones. *Golf for Women* 54-56; December 2000

*Orthopedics today: current news in musculoskeletal health and disease*. Vol 19:2. February 1999.

Pizzo, Robert. *The Walking Magazine*. Oct/Nov 1987.

For further information on osteoporosis, the following Websites may be useful.

## Websites:

The Foundation for Osteoporosis Research and Education <[www.FORE.org](http://www.FORE.org)>

The Osteoporosis Centre <[www.osteoporosis-centre.org](http://www.osteoporosis-centre.org)>

National Osteoporosis Foundation <[www.nof.org](http://www.nof.org)>

NIH Osteoporosis and Related Bone Diseases <[www.osteoporosis.nih.gov](http://www.osteoporosis.nih.gov)>

[www.healthology.com/focus\\_index.asp?b=healthology&f=osteoporosis](http://www.healthology.com/focus_index.asp?b=healthology&f=osteoporosis)

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**NSH T-Shirt Contest**

Each year NSH sponsors a Best T-shirt Design Award; Runner up for Best T-shirt Design; Most number of attendees wearing a state or region T-shirt.

Design a T-shirt that Region IX members will proud to wear to the S/C in Denver, Co and you could win two bottles of BC Red and White wine.

E-mail your designs by July 31<sup>st</sup>, 2007 to:

[heather@nshregionix.org](mailto:heather@nshregionix.org) or

[rose@nshregionix.org](mailto:rose@nshregionix.org)

or if submitting designs by postal delivery please contact Heather or Rose.

The winning design will be printed in time for the S/C in Denver. We are hoping that the members attending the S/C will purchase these T-shirts to proudly represent our Region IX during the T-shirt competition. T-shirt costs will be kept at a minimum and will be on sale at the Region IX meeting in October at the S/C.

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