

### Message from the Acting Chair

Dear Colleagues in the UW Ortho World,

The Academic Year 2009/10 is drawing to a successful close, which gives me reason to reemphasize a sentiment I expressed in the inaugural edition of the UW Orthopaedic eNews: it is important for our Department to reconnect within our own organization. In light of more recent events, I would like to expand on this theme.

On April 24th, 2010, a tribute dinner was held in honor of our immediate past Chair, Dr. Frederick A. Matsen III. Dr. Craig Arntz, '87, a number of UW Ortho Alumni, and Dr. Arntz's partners at Valley Medical Center organized the event. For all present - our Alumni, Faculty, Dr. Matsen's family, current residents, and first and foremost Dr. Matsen and his mentor and long-time collaborator Charles Rockwood III - this was an incredible evening.

Not only was it an opportunity to celebrate Dr. Matsen's career, but it was also a chance to interact and share memories with present and past colleagues.

In our busy lives, chasing RVU's and keeping up with our families, these social occasions have been too infrequent, but on that magical night, as we gave tribute to Rick, we remembered how much we enjoy each other. Our Department has had the good fortune of attracting many special people over decades. Anytime we can reconnect with these people - with whom we have shared momentous times - it is time well spent.

Emerging from this evening were two prevailing thoughts:

1. To create and fund the Anne and Rick Matsen Endowed Chair for Resident Education in tribute to the 23+ years of Dr. Matsen's Chairmanship and in order to support the crucial work of the Residency Director of our program (for more info, see the "Philanthropy Spotlight" section below)

2. To regularly stay connected as UW Orthopaedic Alumnus from here on out, through special educational or celebratory events (or combinations thereof).

**UW Medicine**  
ORTHOPAEDICS AND  
SPORTS MEDICINE



L to R: Acting Chairman Jens R. Chapman M.D., Lyle Sorensen M.D., and Jeffrey Katz M.D.

To stay connected with one another as UW Orthopaedic family attains special meaning in light of the graduation of our eight chief residents. We had a full house during the Resident Research Days and Graduation ceremonies from June 24th - 26th, 2010 and enjoyed the lectures and insights of this year's distinguished Visiting Professor, Dr. Jeffrey Katz, from the Brigham and Women's Hospital and Harvard School of Public Health in Boston.

Of lasting memory was the statement by one of our residents, who spontaneously realized that, "Dr. Katz made us look beyond the surgery". Highlights of the event included Dr. Matsen, '75, receiving the 'Chief Resident's Teaching Award' and Dr. Lyle Sorensen, '93, being awarded the 'Permanent Distinguished Alumnus Award' for his unprecedented efforts as President of the UW-Orthopaedic Alumni organization since 1998. (Please take a look at his message to the Graduating Class '10 later in this UW Ortho eNewsletter.)

As we send off our eight fine young men and woman into their respective fellowships and on their further career paths, I hope the memories from their UW Orthopaedic residency will forever be a part of their lives and prompt them to stay connected with the Alumni network through our Departmental activities, our Alumni organization, and, for those who remain local, the Washington State Orthopaedic Association.

This summer we are planning a special festive occasion, which I hope no graduate of our program will miss. On the occasion of our legend, Dr. Sigvard 'Ted' Hansen '69, announcing his pending retirement, we will launch the inaugural Trauma Summit in Seattle (TSIS) on July 29th-31st, 2010, at the HMC R&T auditorium.

This UW-CME approved meeting will feature a variety of opportunities to get updates on Trauma as well as Foot & Ankle surgery over a series of 2 1/2 days (for more information, see the *Dept News* section below).

You will not want to miss this event!

Thank you all near and far for staying interested in our program and I hope to be able to welcome as many of you as possible at the TSIS event later this summer!

Yours cordially,  
JRC

#### table of contents

Message from the Acting Chair ...	1
<i>Research Spotlight:</i> Peter Cavanagh, Ph.D. ...	2
<i>Research:</i> Seth Leopold, M.D., Brandon Ausk, Ph.D, 2010 Research Report, Grants ...	3
<i>Philanthropy:</i> Pacific Medical, Inc. ...	3
<i>Department News:</i> Faculty Retreat, Hand Course, Resident Match, ISIS Lab, 3ft of Sunshine, Pelvic Acetabular Workshop, PA Dinner, Resident Boot Camp, Graduating ACE's, TSS ...	4 - 6
<i>Faculty &amp; Staff News</i> ...	7-9
Message to Graduating Residents, Meet the Resident Class of 2015 ...	10-12
tech talk, Publications ...	13-14
how d'ya sew an amputated finger back on? (starring Doug Hanel, M.D.) ...	15

## Spotlight on Peter Cavanagh, Ph.D.



Roger Larson, M.D., Frederick Matsen, M.D., Peter Cavanagh, Ph.D. at ORL opening.

The UW Department of Orthopaedics and Sports Medicine is delighted to announce the appointment of Peter R. Cavanagh, Ph.D., D.Sc. as Vice Chair for Research.

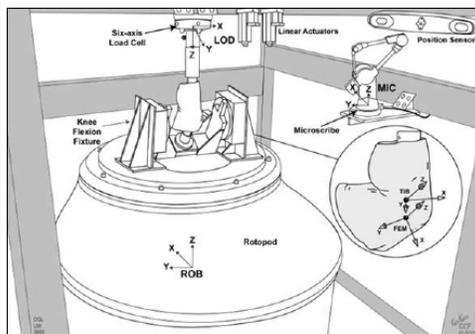
Dr. Cavanagh will seek to provide infrastructure and visibility for Department research at all levels. Among his current goals are the establishment of overarching protocols for retrospective and prospective research studies; providing a pathway to export IRB (Institutional Review Boards) approved data from the EPIC Electronic Medical Record for research purposes; and the design of a new website to showcase research activities in the department.

Dr. Cavanagh's own research team, based at UWMC, is engaged in studies of women's knee injuries using robotics (see article below), bone loss in space, and computational biomechanics of the lower extremity. His team is funded by NASA, the National Institutes of Health, and the Endowed Chair for Women's Sports Medicine and Lifetime Fitness. He blogs on health-related research topics of interest to active women at [www.WomensSportsMedicine.org/blog](http://www.WomensSportsMedicine.org/blog)

### Orthopaedic Robotics Laboratory

The Cavanagh research team officially opened the new Orthopaedic Robotics Laboratory (ORL) on March 30.

After an extensive renovation, the laboratory – situated on the 10th floor in the BB wing of University of Washington Medical Center – is now in active use, focusing on knee injuries in young women and robotically assisted surgery. Two contrasting robots for these two different applications are available in the lab: a small low-load linear Denso VP robot and a high-load Parallel Robotic Systems R-2000 Hexapod.



Schematic of Parallel Robotic Systems R-2000 Hexapod.

The link between robots and orthopaedics is not immediately obvious since most of us are much more used to seeing robots on assembly lines or in movies like *Avatar*. The robots in

the ORL are neither autonomous nor intelligent, but they can be trained to perform certain useful actions accurately and precisely. For example, on the R2000, we can move a cadaver knee joint through a very precise pattern of motion while applying the kind of stresses the joint experiences during intense athletic competition. This enables us to study injury mechanisms and to find out if current surgical techniques can be improved.

For example, we are studying the “Larson Procedure,” devised by our own Department of Orthopaedics and Sports Medicine surgeon Roger V. Larson, M.D. In addition to the conventional single bundle reconstruction of the ACL, Dr. Larson's technique adds a second construct on the outside of the knee joint with the intention of providing additional stability for badly injured knees. The robot can take a knee joint on which this procedure has been performed, and measure how the stability of the joint is affected by placement of the new lateral stabilizing construct.

The small robot has the potential to provide very accurate placement of drill guides during orthopaedic procedures where there is very little margin for error. A patient's CT scan is quantitatively analyzed before the procedure, and the robot is provided with information about bone architecture in the appropriate reference frame. Optimal trajectories for screws

and other components can then be identified and the drill guide can be moved into the correct location to assist the surgeon in component placement.



Linear Denso VP robot

Other applications are also on the horizon. Our trauma surgeons are constantly pushing boundaries in techniques to repair complex fractures, and the large robot can test such quantities as the pull-out strength of a repair subjected to a complex loading pattern. This will lead to improved orthopaedic devices.

Stop by and find out more by visiting with senior fellow Dong-Gil “Andy” Lee, Ph.D., and undergraduate Nick Kramer, who can frequently be found tending the robots in room BB-1030.

### Mother's Day Fun Run

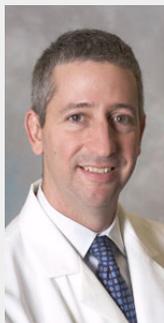
The 2nd Annual Mother and Daughter Fun Run/Walk, hosted by the Center for Women's Sports Medicine and Lifetime Fitness, was a great success! There were around 150 participants on Mother's Day, including fathers, sons, dogs, and little ones in strollers. Mother Nature smiled upon us too, with the best weather Seattle had seen in 2010.

Seward Park, a new location this year, was fantastic -- its straightforward, flat 5K course offered views of Mount Rainier and Lake Washington. We plan to host the 3rd Annual event there as well, mark your calendars for Sunday, May 8, 2011!

It was wonderful to see so many women coming together to celebrate Mother's Day. Keeping fit is so important to a long and healthy life, and these mothers deserve praise for passing this value on to their children. Thanks to everyone who participated!



## Seth Leopold, M.D., Peer Review Process



Seth Leopold, M.D. has, among his academic interests, a focus on the peer review process. He was recently named an Advisory Editor at Clinical Orthopaedics and Related Research, and continues to serve as an Associate Editor at the Journal of Bone and Joint Surgery (American), the leading clinical journal of our specialty.

In addition to participating in peer review through those roles, he also studies the process itself. During this academic year, he presented the results of a study on positive-outcome bias in orthopaedic peer review at the Sixth International Congress on Peer Review and Biomedical Publication, a prestigious meeting sponsored by the Journal of the American Medical Association which occurs only once every four years. His co-authors on this paper, which is now in review at Archives of Internal Medicine (a subsidiary of JAMA), include the editors-in-chief of JBJS and CORR, as well as an orthopaedic chief resident, Wendy Emerson, M.D. The work was picked up by the lay press, and covered extensively both in ScienceNews: ([http://www.sciencenews.org/view/generic/id/47826/title/Reviewers\\_prefer\\_positive\\_findings](http://www.sciencenews.org/view/generic/id/47826/title/Reviewers_prefer_positive_findings)) and Nature news online (<http://www.nature.com/news/2009/090914/full/news.2009.914.html>).

## In Vivo Quantification of Focal Alterations in Cortical Bone Morphology

Authors: **Brandon Ausk**, Philippe Huber, Sandra Poliachik, DeWayne Threet, Steven Bain, Sundar Srinivasan, Ted Gross

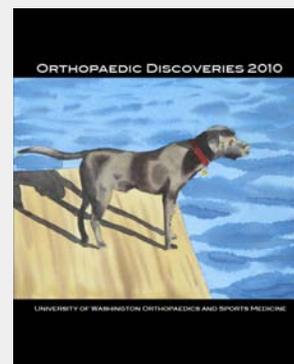
(This work was supported in part by National Institutes of Health (AR 45665) and the Sigvard T. Hansen, Jr. Endowed Chair)

Medical imaging has long been used as a diagnostic tool in clinical applications. During the treatment of a disease state, a patient will often undergo multiple modalities of imaging of the specific region of interest over a series of days, weeks or even years. Recent technological advancements have aimed at expanding the use of these datasets from a single snapshot of a disease state, to one that can compare the datasets across time (and across imaging modalities). To do this, imaging data sets must be transformed into a single coordinate system, a process known as image registration. Image registration techniques are currently being applied across multiple fields of medicine with a high degree of success. Read the rest of the article here: [https://www.orthop.washington.edu/uw/invivoquantification/tabID\\_\\_3376/ItemID\\_\\_320/Articles/Default.aspx](https://www.orthop.washington.edu/uw/invivoquantification/tabID__3376/ItemID__320/Articles/Default.aspx)



Brandon Ausk, HMC Research Scientist and Engineer

## Orthopaedic Discoveries 2010



Our 2010 Research Report was released on June 25th.

The articles in the report underscore the diversity and depth of our Department's research and clinical accomplishments. This edition also commemorates our Department's immediate past Chair, Dr. Frederick A. Matsen III.

If you would like a copy of the report, please contact Fred Westerberg at: [fwesterb@u.washington.edu](mailto:fwesterb@u.washington.edu)

## Recently Awarded Research Grants

The OMeGA Medical Grants awarded our Shoulder and Elbow Service \$50,000 in May. Trauma was awarded \$62,000. Both grants promote the Fellowships on these two services.

Michael Lee M.D. received \$30,000 Young Investigators Research Award from AOSpine for his "Facet Kinematics in a Limited vs. Subtotal Microdisectomy"

## Philanthropy: Spotlight on Pacific Medical, Inc.



Pacific Medical, Inc. recently pledged \$125,000 to the Frederick A. Matsen III, M.D. and Anne L. Matsen Endowed Professorship in Orthopaedics.

Once we reach the minimum goal of \$500,000 to create this endowed faculty position, the Matsen Professorship will support the department's education program and our residency program director. Thank you to Pacific Medical, Inc. and to John Petlansky, Jeffrey Leonard and Paul Wiese for stepping forward with such a generous first gift to this endowment.

If you are interested in learning more about the Matsen Professorship, please contact Jodie Miner, director for philanthropy, at 206-685-0177 or [jominer@uw.edu](mailto:jominer@uw.edu).

Theodore 'Ted' Wagner ([wagner@u.washington.edu](mailto:wagner@u.washington.edu) or (206) 543-3690) is serving as the surgeon champion for this endowed professorship.

# Department News

## 2010 Faculty Retreat



*L to R: Sundar Srinivasan Ph.D., Ted Hansen M.D., Steven Bain M.D., Lisa Taitsman M.D., Peter Cavanagh Ph.D., Daphne Beingessner M.D., Meg Kerrigan, Jens Chapman M.D., David Barei M.D., Stephen Zieniewicz, Walter Kregel M.D., Patrick Green, Chip Routt M.D., Chris Allan M.D., Howard Chansky M.D., Doug Hanel M.D., Ken Karbowski, Johnese Spisso, Bruce Sangeorzan M.D., James Krieg M.D., Mike Lee M.D., Ted Wagner M.D., Jerry Huang M.D., James Wu Ph.D., Tom Trumble M.D. (above Dr. Wu), Frederick Matsen M.D., Greg Schmale M.D., Russell Fernandes Ph.D., Chappie Conrad M.D., Kit Song M.D., Vincent Mosca M.D., Winston Warme M.D., Paul Manner M.D.*

The 2010 Orthopaedics & Sports Medicine Faculty Retreat was held on April 17th at the Mercer Island Beach Club. The faculty discussed changes in the health care and external funding environment, the UW Medicine strategic plan, the vertical integration of all sites of practice, and advantages to translational efforts and partnerships with external groups and/or Departments in fulfilling our organization's mission.

Faculty also had the opportunity to participate in small workshop groups on Residency, Cartilage and Arthritis, Bone and Arthritis, Hand/Upper Extremity, and Spine. In these groups they demonstrated the potential power of collaboration across service lines.

In addition to a very robust faculty turnout, the Department was privileged to have a strong showing from our Administration. Michael Vanderlinde served as guest speaker on Health Care Reform. Johnese Spisso, Meg Kerrigan, Steve Zieniewicz and Patrick Green updated the faculty on initiatives and reemphasized the unwavering support of UW Medicine for the Department of Orthopaedics & Sports Medicine.

## 2010 Upper Extremity Fractures & Complex Injuries Course

On April 24 the Department, in conjunction with Plastic Surgery and Rehabilitation Medicine, held its annual Upper Extremity Fractures & Complex Injuries Course. The course covered treatment of the hand and upper extremity through lectures and anatomical demonstrations. Approximately 238 therapists from Canada, Washington, Idaho, Montana, Oregon, California, and Hawaii attended. This year's visiting professor was Prosper Benhaim, M.D., Chief of Hand Surgery and Associate Professor at UCLA Medical Center, who is also a long-time mentor of our Jerry Huang, M.D.

Lecturers and contributors included Drs. Chris Allan, Daphne Beingessner, Prosper Benhaim, Jeff Friedrich, David Gerlach, Douglas Hanel, Jerry Huang, David Kawamura, Nilpesh Patel, Lee Reichel, and Irakli Soulakvelidze - as well as therapists Clyde Johnson, Thomas McClure, Carol Recor, and Bridget Zaro.

## 2010 Resident Match Celebration

Acting Chairman Jens Chapman M.D. and his wife Shirley recently hosted a celebration of the 2010 Resident Match. Dr. Chapman and Doug Hanel M.D., Director of Orthopaedic Education, thanked the interview teams for their time and participation, and all faculty and residents for their generous donations to support interview dinners.

It was noted that the resident turnout for the interviews, and presence of current R1's throughout the interview day, were especially impressive this year. Dr. Hanel's wife Peggy, Residency Coordinator Angela Weiss, and Clerkship Coordinator Amanda Schwanz were acknowledged for their help and support with interviews and were presented with bouquets. Special thanks to Shirley Chapman for a truly memorable event!



*Doug Hanel M.D., Residency Coordinator  
Angela Weiss, Jens Chapman M.D.*

# Department News

## ISIS Lab & Lecture Hall Open at Harborview



On April 12, the Department was excited to be part of the opening of the new lab and lecture hall at the Institution for Simulation and Interprofessional Studies (ISIS) at Harborview Medical Center.

Dave Barei, M.D. presented a lecture about Pilon fractures and Tibial Plateau fractures to the residents for their weekly Monday Morning conference. This event was the first didactic session to be held in this remarkable new facility. The new lab provides state-of-the-art wet lab and simulation lab equipment in an open, comfortable space to facilitate education, using both cadaver models and bench-top simulators. In addition, it has an adjacent lecture hall, and is centrally located in the city with ample parking under the building.

The lecture and lab session led by Dr. Barei was a fantastic conference. We learned about his clinical approach to Pilon and Tibial Plateau fractures, and then participated in a cadaver lab session in the new lab where, un-

der Dr. Barei's direction, we learned relevant anatomy and practiced surgical approaches to the proximal and distal tibia. The session was a resounding success, and residents unanimously voiced positive feedback regarding the conference's high educational quality.

We appreciate the great lectures and labs that have been held here since, including sessions by Dr. Robert Dunbar, Dr. Sean Nork, Dr. Steve Benirschke, Dr. Lisa Taitsman and Dr. Paul Manner. We plan to incorporate cadaver lab and surgical skills sessions into many more future conferences, and the new ISIS lab greatly helps to make this possible.

- Aaron Chamberlain, M.D.  
Resident, Class of 2011

## Susannah White's Three Feet of Sunshine Guild Spreads Warmth to Pediatric Patients

April 19th -- a Monday in the middle of spring -- was unseasonably warm in Seattle, as temperatures reached a surprising 70 degrees. It could well be the warmth and sun were brought in by the Sunshine Book Cart, which was donated to Seattle Children's Hospital's Skeletal Health Program that day by Susannah White's Three Feet of Sunshine Guild.

Three Feet of Sunshine honors the legacy of Susannah White, daughter of our department's Klane White, M.D. Its name showcases Susannah's ever-sunny and playful disposition. The guild enriches the lives of children and families who bear the weight of life-threatening illnesses. The Sunshine Book Cart gives pediatric patients something fun to do during long appointments, and lets them choose the books they want. It came stocked on April 19 with 500 books, collected by Susannah's cousin Jake White.

The book cart is available during skeletal health clinic hours which are every Monday, plus the second and fourth Tuesdays, of each month. Donations of books are welcome! Please drop off Mondays at SCH's Orthopaedics office in W-7706. For questions about the guild, book cart, or making a donation, email [info@threefeetofsunshine.org](mailto:info@threefeetofsunshine.org) or visit [www.threefeetofsunshine.org](http://www.threefeetofsunshine.org).

## Pelvic-Acetabular Workshop



The annual Pelvic-Acetabular workshop was held at the Harborview May 21st. The workshop was sponsored by AO and Synthes. Rob Toni, assisted by Stacie Pelkey, did an outstanding job organizing and coordinating the session. The equipment was perfect, the learning was comprehensive, and it was another great educational day for the Department's six Trauma ACE's.

*Pictured above: (center) Chip Routt M.D. (clockwise from top) Don Glasgow M.D., Chris McAndrew M.D., Julius Bishop M.D., William Wood Cross M.D., Greg Dikos M.D., Robert Allan Maples M.D.*

## PA Appreciation Dinner



The PA Appreciation dinner was held on May 21, 2010 at Piatti Ristorante.

Among the PA, faculty, & staff attendees were, pictured above (clockwise from top): *EChing Bertelsen, Alex Bertelsen, Howard Chansky M.D., Dan Stamper, Sue Earls, Peter Hall, Jennifer Hamilton, Ivory Larry, Nicole Patrick, Patrick Green, Dan Patzer*

*(attendees not pictured: Jens Chapman M.D., Tim Coglon, Magee Saewert)*

# Department News

## Resident Boot Camp 2010



This year's camp, held on June 25th, featured the inaugural Resident Research Review presented by our new Vice Chair of Research, Dr. Peter Cavanagh.

Leading representatives of our Orthopaedically related labs included Drs. Steve Bain (OSL / Dr. Gross lab), Randi Ching (ABL), Russell Fernandes (Cartilage / Dr. Eyre lab), Bill Ledoux (Biomechanics/Dr. Sangeorzan), Sundar Srinivasan, James Wu, and Liu Yang.

The goal of this meeting is to assign incoming junior residents with a Basic Research project in one of our leading labs from the beginning, to assure greater academic completion of high quality research conducted with our residents in the future.

## Trauma Summit in Seattle, July 29-31 at HMC

Our inaugural Trauma Summit, presented by HMC's Orthopaedic Alumni Organization in association with UW Medicine and UW School of Medicine's Office of Continuing Medical Education, will be Thursday, July 29th through Saturday, July 31st at Harborview's Research and Training Building.

This first-of-its-kind event features an unparalleled congregation of internationally renowned Trauma and Foot and Ankle Surgery faculty with lectures, interactive case discussions, cadaveric dissections of state-of-the-art techniques, including a trip to our new HMC-ISIS labs. The meeting presents quite a learning opportunity! Great interest has been shown from large numbers of alumni and colleagues in a variety of Orthopaedic specialties. The summit is also in celebration of Dr. Sigvard T. Hansen's announced retirement at the end of this year.

The registration fee for this unique and informative symposium is \$42. It offers up to 16.25 hours of CME credits and will be broadcast on UWTV. If you have any questions or wish to RSVP, please contact Karen Morton at HMC, [klmorton@u.washington.edu](mailto:klmorton@u.washington.edu).

## Congratulations to the 2009 - 2010 Graduating ACEs!



*Top row photos: Dan Heaston (Shoulder & Elbow), Kevin MacDonald (Tumor), Erica Burns (Shoulder & Elbow)*



*Photo to the left: Back Row (All Trauma ACEs): William Cross, Christopher McAndrew, Julius Bishop, Donald Glasgow*

*Front Row: Abilio Reis (Spine), Maximillian Reinhold (Spine), Roland Kent (Spine), Robert Maples (Trauma), Gregory Dikos (Trauma), Benjamin Stevens (F&A), Sarah Hanslow (F&A), David Dalstrom (F&A)*

# Faculty & Staff News

Orthopaedic Student Researcher **Bryan Absher** graduated UW June 12th with a BS in Electrical Engineering! Also, Bioengineering undergraduates **Elliot Lee** and **Melissa Meister** are doing their Capstone projects with the Cavanagh Lab.

**Joy Beatty, MSPT** is currently enrolled in a 12-month Manual Therapy Residency program at the Ola Grimsby Institute. Upon completion she will be a Certified Orthopedic Manual Therapist.



*Harborview staffers Julie Bould, Janet Grant, Janet Wierenga, and Connie Robertson enjoying our Staff Appreciation Event at the Waterfront Activities Center, April 23rd*

**Peter Cavanagh, Ph.D.** conducted an offloading workshop, and participated in two conference presentations, at a Diabetic Foot Conference in Los Angeles in March.

**Dr. Cavanagh** was a member of the Integrated Systems Physiology Expert Group at the THESEUS kick-off in Sasbachwalden, Germany, April 6-9. Part of the European Science Foundation, the THESEUS project identifies priorities for future research to enable human exploration of space, and to develop a strategic roadmap for European funding organizations. (It is fairly analogous to NASA.)

**Dr. Cavanagh** was extensively quoted in a New York Times article on winter and outdoor athletic training:

<http://www.nytimes.com/2010/03/04/fashion/04best.html?pagewanted=all>

**Dr. Cavanagh** received a Career Achievement Award June 3 from the Biomechanics Interest Group at the American College of Sports Medicine's Annual Meeting in Baltimore, MD. On June 12th, he spoke on "Kinesiology, the analysis of motion" at the National Academy of Sciences Sackler Colloquia in D.C.



*Paul A. Manner, M.D. is presented with a plaque honoring his promotion from Assistant Professor to Associate Professor effective July 1. L to R: Vice Chair Howard A. Chansky, M.D., Dr. Manner, & Acting Chairman Jens R. Chapman, M.D..*

**Caitlin Green**, daughter of **John R Green III, M.D.**, graduated from Holy Names Academy this spring. She'll begin classes at Georgetown University in D.C. this fall!

**Correction from Issue #1: Sigvard "Ted" Hansen, M.D.**'s retirement date is December 31, 2010. We apologize for the error.

**Andrea Hanson, Ph.D.**, presented a poster at the Aerospace Medical Association Annual Scientific Meeting in Phoenix, AZ (May 9-13) on "Miniaturized Sensors to Monitor Simulated Lunar Locomotion." She then lectured at Western Washington University May 19 on "Space Physiology: Bone and Muscle Loss During Spaceflight," as part of their Scholars Week. Also, and her husband celebrated their first Anniversary June 6th on the Olympic Peninsula, hiking the Olympic Rainforest!

**Nick Happe-Hartsell**, son of SMC Nurse Manager **Claudia Happe-Hartsell**, graduated from O'Dea High this spring. He'll attend Quinnipiac University in Hamden, CT this fall.

**Brad Henley, M.D.** was elected Chairman of AAOS's Board of Specialty Societies (BOS) for 2010-2011. He was also Co-Chairman of the National Orthopaedic Leadership Confer-

ence April 28-May 1 in Washington DC.

**Jennifer Howard, PSS** was recently accepted into the law school at UW. She will enroll in the fall. Way to go, Jenny!

**Aaron Kingsland, DPT** has been rehabbing from ACL surgery at Sports Medicine Clinic, where ACL reconstructions are perhaps the most common type of post-op patient seen.



*Anne and Frederick A. Matsen, M.D., at the celebration dinner held in his honor, April 24, 2010.*

A June 9th Seattle Times report quoted **Brian Krabak M.D.**, **Chris Wahl M.D.** and Clinical Instructor **Ed Khalfayan M.D.** on PRP (platelet-rich plasma), used for tendon and joint pain. In April, Dr. Khalfayan treated Seattle Mariners pitcher Cliff Lee with the procedure. [http://seattletimes.nwsource.com/html/localnews/2012063522\\_platelets09m.html](http://seattletimes.nwsource.com/html/localnews/2012063522_platelets09m.html)

# Faculty & Staff News

“Grand Rounds: Surgical Relief Efforts in Haiti” aired several times in late May on UWTV, and June 8th on Research Channel. **James C. Krieg, M.D.** and Penn Medical School’s Samir Mehta, M.D. shared their very challenging experiences as Haiti volunteers.

The WSOA was chosen 2009’s AAOS State Society of the Year, given at an NLOC meeting. The award was based on work during **Walter Krengel, MD.**’s term as President, leading to a Supreme Court ruling favoring Orthopaedic and other practices’ ability to employ physical therapists. This has positive implications for other types of medical providers such as PA’s, NP’s, etc (photo below).



At 2010’s NW Biomechanics Symposium May 21-22, hosted by UW and the VA RR&D Center of Excellence, **Atul Kumar, M.D.** spoke on “Design of a 1st Metatarsophalangeal Hemi-Arthroplasty Implant Based on Morphological Data,” co-authored by Dr. Cavanagh. **Kerim Genc** presented “Examining the Changes in Femoral Strength due to Long Duration Space Flight: A Preliminary Modeling Framework using a Bedrest Analog.” **Andrea Hanson, Ph.D.** addressed “Bone Stimulus and Astronaut Activity Recognition During Missions to the Moon and Mars.”

**Mark Lanning, DPT** recently attended a course focusing on treating knee pathology. The course, “Advanced Clinical Skills for Orthopedic & Sports Related Knee Injuries” was instructed by Robert Manske.

**Roger Larson, M.D.**, completed the Boston Marathon on April 19th.

Congrats **Grant Lohse, M.D.** and wife Liza, whose twins Nathaniel and Tessa were born April 22!



*Bone & Joint Clinic staff threw a surprise reception for newlywed Orthopaedic PA’s Dan and Magee Patzer on May 5th! L to R: Magee, Dan, Nicholas Vedder M.D., Jerry Huang M.D.*

In March, **Vincent Mosca, M.D.** was Guest Speaker at the Orthopaedic Section of the Royal Society of Medicine’s annual meeting in London. He also, as Visiting Professor, gave the Carroll B. Larson Shrine Memorial Lecture at the University of Iowa in April.

Department PA’s **Dan Patzer** and **Magee Saewert** were married in a private ceremony April 4th in Oceanpark, WA at the Full Circle Cafe -- a local diner that proved quite hospitable and spontaneous! Check out this article in the local paper: <http://www.chinookobserver.com/Main.asp?SectionID=11&ArticleID=33564>

**John Sidles, Ph.D.** gave a talk to an Army Research Office (Materials Science Division) program review entitled “Advances on Single Nuclear Spin Detection,” on April 22.

The **Sports Medicine Physical Therapy Clinic** hosted a Proprioceptive Neuromuscular Facilitation course in March. The 4 day course, presented by the Institute of Physical Arts, was well-attended with 26 participants across the country in attendance.

Last fall, **D. Michael Strong, Ph.D.** received the AABB (American Association of Blood Banks, photo to the right) President’s Award in recognition of his public service and contributions to health care. The award

recognizes leadership in championing the United States Biovigilance Network, which analyzes adverse reactions in blood collection and transfusion, as well as organ and cell donation and transplantation. Dr Strong has received Lifetime Achievement Awards from four different Associations.

**Srinivas Tadepalli, Kerim Genc, and Peter Cavanagh, Ph.D.** presented work on a Diabetic Foot Finite Element Model, and data from a Foot Forces in Space experiment, at the Orthopaedic Research Society conference in New Orleans in March.

**Carol C. Teitz, MD** gave a paper on the medical school admissions screening process at the 2010 Western Group on Educational Affairs of the AAMC in Pacific Grove, CA.



*Jay Menitove M.D. (President of AABB), Matt Kuehnert, M.D., D. Michael Strong, Ph.D. and Jerry Holmberg, M.D.*

# Faculty & Staff News

**Srinivas Tadepalli** and **Dr. Cavanagh** co-presented the abstract “Mesh Morphing for Accelerated Representation of Patient-Specific Foot geometry in Finite Element Analysis” at the Orthopaedic Research Society’s New Orleans meeting, March 6-9. At that meeting **Kerim Genc** spoke on “Using the Enhanced Daily Load Stimulus Model to Quantify the Mechanical Load and Bone Mineral Density Changes Experienced by Crew Members on the International Space Station.”

**Christopher Wahl, M.D.** was designated by the AOSSM (American Orthopaedic Society for Sports Medicine) as Washington Council of Delegates Representative. He will serve from August 2010 through July 2013.



*Christopher Wahl, M.D.*

**Dr. Wahl** was named for a 3-year term on the Membership Committee of the Arthroscopy Association of North America (AANA). He will also teach shoulder arthroscopy at the

AANA’s Regional Course this September.

The Yale Medical School (New Haven, CT) held a ribbon-cutting ceremony in May for the Cushing Brain Tumor Registry Museum, which holds brain specimens, photos, and records from 1894-1932. It documents the work of Harvey Cushing, a father of modern neurosurgery. In the early 1990’s, as a Yale medical student, **Dr. Wahl** was instrumental in uncovering the archive, which was stashed in the sub-basement of the Yale Medical School Dormitory. He wrote his doctorate thesis, and then published manuscripts, on the Registry’s history and social implications.

-----

## *In Memoriam*

**Henry H. Bohlman, M.D.**

One of the true legends of Orthopaedics and Spine Surgery, Henry H. Bohlman M.D. passed away peacefully in his sleep May 27. He was a personal friend and mentor of our Acting Chair Jens Chapman, M.D.

Dr. Bohlman was a founding member of the CSRS and served as CSRS President in 1988 and President of FOSA in 1994. He was the recipient of numerous honors and awards and authored countless publications and articles. A senior member of Case Western Reserve University Hospitals, he personally trans-

formed Spine Surgery into the major specialty it is today. Through his training of 116 Fellows, he dramatically influenced spinal care worldwide .

Beyond this profound professional impact, he was an amazingly generous and thoughtful man, revered by his patients. As Dr. Chapman commented, “we have lost a wonderful colleague in Henry.”

**William T. Thieme, M.D.**

William T. Thieme M.D., a long-time Seattle Orthopaedist and department alumnus, passed away on May 30th.

Born in Everett in 1934, Dr. Thieme graduated with honors from Yale, journeyed to Washington University in St. Louis for his medical degree, and graduated from the UW Orthopaedics residency program in 1968.

After completing a research Fellowship in Edinburgh, he practiced Orthopaedic Surgery in Seattle, serving as the head of Children’s Hip Clinic, Chief of Orthopaedic Surgery at Swedish and Ballard, and Chief of Staff at Ballard. He retired in 2001

In addition to his talents, Dr. Thieme was a kind man with a warm smile. His family requests that any donations in his honor be made to Friends of the Orphans NW.

## *Welcome New Employees!*



*Manny being Manny, Genie being Genie: New SMC Admin Assistant Genie Bizjak with Dodger slugger Manny Ramirez*



*Jocelyn Jette, new Research Coordinator for Dr. Matsen, en route to a Black Eyed Peas concert!*



*Tina Marie Valdez, former HMC Research Secretary, now a Program Coordinator at RII, at Skagit Valley’s Tulip festival*

## Message to the Graduating Residents



A banquet was held on June 25th, 2010, at the Columbia Tower Club, in honor of the graduating Chief Residents. The graduates are pictured above. From L to R: Chris Wolf, MD; Vinko Zlomislic, MD; Mike Hwang, MD; Lee Pace, MD; Sean Amann, MD; Wendy Emerson, MD; Aric Christal, MD; Jeremy Bauer, MD

*Message to the graduating Chief Residents from the President of the UW Orthopaedic Surgery Alumni Organization, Dr. Lyle Sorensen '93*

Dear Chiefs,

When I told a long-time patient of mine that I was thinking of writing a speech to the graduating residents of the UW Orthopaedic program she immediately offered to write a poem on my behalf to us surgeons from a patient's perspective, since I would be too busy to do so. After reading this I thought that I should offer this not only to the graduating class 2010, but to all of us in our profession as a daily reminder of the special privilege and the special responsibility it is to be a surgeon. Here it is without alterations.

*Lyle Sorensen, M.D.*

### PREPARATION

All your lives you have been getting ready  
Every one of you, every single life  
From the very beginning  
Has been getting ready  
For this morning, for now  
When you touch my life

Not just the surgeon, child playing doctor,  
Deciding to be one, struggling through med school,  
The anatomy courses, choosing surgery,  
Where there is such hope of fixing things  
All the practice, the terrible delicate touch,  
All the surgeries before this,  
Each one teaching something, large or small.

And this morning, getting up, standing in the shower,  
Eating breakfast, driving, scrubbing hands,  
Hoping or praying for deep steadiness

And the ability to understand and decide  
And work quickly and well  
Once what is there can be seen.  
This, now, is the point of all time

Coming with this connection  
With me.

Not just the Anesthesiologist, wondering  
About pain and consciousness, learning  
Neurology and biochemistry and physiology,  
Permeable membrane and circulation,  
Learning the technology, learning  
The skill of continual focus  
And of making, in the body,  
The calm ground of steady breathing, steady heartbeat,  
Under the knife and the clamps and the saw-of holding  
The ground steady beneath the surgeon's hands.

Getting up this morning, dressing,  
Looking at the headlines, kissing the kids,  
Hoping to remember to get the oil changed,  
Driving into the parking lot,  
Coming to this meeting with me.

Not just the nurses tracking  
Tools and sponges, knowing from long practice  
The sequence what comes next, making themselves  
Silent extensions of the surgeon,  
Demanding no attention, ready to put  
The asked-for instrument in the blind, out-stretched hand.

Getting up this morning, putting the clothes in the washer,  
Pouring milk in the coffee, rumpling the hair  
Of the beloved one across the table,  
Going out the door, coming to the meeting  
With me.

And the aides the ones  
Who warm the blankets, push the gurney,  
Set up the sterile instruments-  
And the ones who clean the floor,  
And smile in my face.

All your lives you have been getting ready,  
Every one of you. Every single life,  
From the very beginning  
Has been getting ready  
For this morning; for now,  
When you touch my life.

Oh, may you be happy today!  
May you all be clear, and confident,  
And in full command  
Of all your knowledge and wisdom  
And attention!  
May you bring the very best of all you are,

As you come, each one of you,  
To this point in time, for which all else  
Has been preparation.

*(written by an anonymous patient of Dr. Sorensen in 2010)*



*Gretchen and Lyle Sorensen, M.D.*

## Meet the Class of 2015 New Orthopaedic Residents



**Tim Alton, M.D.**

*Hometown:* Oregon City, OR

*College:* Willamette University

*Medical School:* Wake Forest School of Medicine

*Clinical/Research Interests:* Open to all areas of Orthopaedics

*Activities enjoyed outside medicine:* Running, skiing, hiking/camping, golf, college football and spending time with my wife

**Kenneth Gundle, M.D.**

*Hometown:* Portland, Oregon

*Clinical/Research Interests:* All of orthopaedics, anatomy, outcomes research, the history of orthopaedics.

*Activities enjoyed outside medicine:* Traveling by car, train, foot, or plane, cooking, reading broadly, cheering on the Portland Trailblazers, keeping up his Japanese, and time with family (including his dogs). Looking forward to hiking, jogging, and otherwise exploring the Great Northwest.



**Daniel Holtzman, M.D.**

*Hometown:* Los Gatos, CA

*Clinical/Research Interests:* Trauma, Sports Medicine, Cell Biology

*Activities enjoyed outside medicine:* Music/Concerts, Movies, Baseball (Go Giants!), Football, Golf

**Courtney O'Donnell, M.D.**

*Hometown:* El Segundo, CA

*Clinical/Research Interests:* Pediatrics

*Activities enjoyed outside medicine:* bike racking, backpacking, running, skiing, yoga, family, country music.



## Meet the Class of 2015 New Orthopaedic Residents



**Paige Mallette, M.D.**

*Hometown:* Telluride, Colorado

*College:* University of Colorado

*Medical School:* University of Colorado

*Clinical/Research Interests:* Haven't figured that out yet.

*Activities you enjoy outside medicine:* Skiing (especially bluebird powder days), hiking, cruisering and pro kadima at the beach

**Daniel Patton, M.D.**

*Hometown:* Columbus, Wisconsin.

*Medical School:* Loma Linda University, CA

*Clinical/Research Interests:* Developing World. Trauma, Peds, Joints

*Activities enjoyed outside medicine:* Triathalons, KiteBoarding, any Adventure...



**Amanda Roof, M.D.**

*Hometown:* Harrison City, PA (east of Pittsburgh)

*Clinical/Research Interests:* Orthopaedic Pediatrics and Oncology, Wilderness Medicine

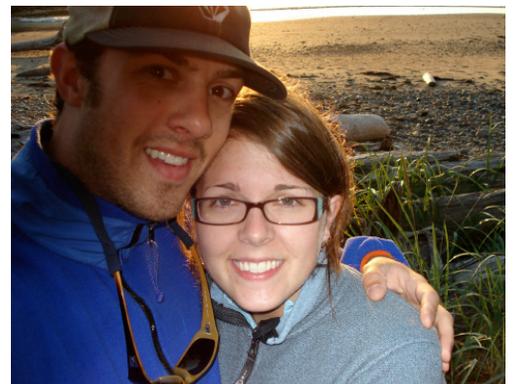
*Activities enjoyed outside medicine:* Traveling with friends/family, skiing/hiking, football/volleyball/softball, new food/restaurants, baking, arts & crafts

**Laura Stoll, M.D.**

*Hometown:* Sandpoint, Idaho

*Clinical/Research Interests:* Undecided

*Activities enjoyed outside medicine:* Skiing, anything on the water, backpacking, football, reading, and eating good food with friends and family.



# Tech Talk

## *On the Horizon*

Web content contribution for everyone! Computer Support is developing ways to help you communicate online, quickly and easily, with patients, colleagues and staff. This infrastructure tech is called content management. The product suite will enable users to work directly on web pages in a collaborative way. We'll have an effective means to promote all of our department talent and data, while maintaining uniformity and an approval process. Your contribution will count! And, you are welcome to visit while the HOUSE is under construction:

<http://test.orthop.washington.edu>

## *There is a lot of Phishing going on*

- Never email any password
- Never email personal information
- Never email credit information
- Everyone's email is being assaulted by torrents of spam. Currently, nearly 43 percent of the email arriving at UW (12 million out of 28 million messages a month) is spam.

## *ARE YOU SENDING SPAM?*

Most systems consider an email spam if sent to more than 20 addresses. You should use Mailman to create bulk email:  
[http://www.washington.edu/computing/email/manage/bulk\\_email.html](http://www.washington.edu/computing/email/manage/bulk_email.html)

## *McAfee is out, are you in with Sophos?*

The deadline is past! Using the expired UW-licensed McAfee anti-virus leaves you unprotected. If you need help let us know at [orthohlp@uw.edu](mailto:orthohlp@uw.edu). Don't forget to download and protect your home computers, free!  
<https://www.washington.edu/uware/sophos/>

## *Security Corner*

Last month our department lost two computers and three hard drives.

- Does your encrypted data protect personal information from identity theft? If not, all a thief needs to do is remove the drive, connect it to their computer, and all the data is readable, no passwords needed.
- Is your laptop insured by UW Risk Management?

- When was the last time your computer was backed up by the department tape backup system, Retrospect?
- Do you have an external hard drive, USB or other device you use to back up your data?
- Do you back up your critical data on three different pieces of media?

## *Where's the Beef?*

This isn't your Facebook Farmville but, somewhere by Arlington, WA, is WWW (Western Washington Wagyu), the tiny farm run by Senior Computer Specialist **Mike Burdett** & his wife Lisa.

Check out their website and meet Gus (short for Angus), Betty, Wilma, Bonnie, & Baker. Summer's here and it looks like they'll have a few Cornish Cross (genetic monster) chickens for 5-6 weeks.

<http://sites.google.com/site/westernwashingtonwagyu/>

**For the best Help Desk service place your IT request at:**

<https://intranet.orthop.washington.edu/Support/Forms/Tickets.aspx>

## *Recent* FACULTY PUBLICATIONS

### *Peer Reviewed:*

**Bain SD**, Jerome C, Shen V, Dupin-Roger I, Ammann P: Strontium ranelate improves bone strength in ovariectomized rat by positively influencing bone resistance determinants. *Osteoporosis Int.* 2009; 20:1417-1428

Poliachik SL, **Bain SD**, **Threet D**, **Huber P**, **Gross TS**: Transient muscle paralysis disrupts bone homeostasis by rapid degradation of bone morphology. *Bone.* 2009; 46:18-23

**Barei DP**, Shafer BL, **Beingessner DM**, Gardner MJ, **Nork SE**, **Routt ML**: The impact of open reduction internal fixation on acute pain management in unstable pelvic ring injuries. 2010; *J Traum*

**Bellabarba C**, Fisher C, **Chapman JR**, Dettori JR, Norvell DC: Does early fracture fixation of thoracolumbar spine fractures decrease morbidity and mortality? Apr 2010; *Spine*

Dahl MC, Kramer PA, Reinhall PG, **Benirschke SK**, **Hansen ST**, **Ching RP**: The efficacy of using vibrometry to detect osteointegration of the Agility total ankle. Mar 2010 [Epub ahead of print]; *J Biomechanics*

Caron T, **Bransford R**, Nguyen Q, Agel J, **Chapman JR**, **Bellabarba C**: Spine Fractures in Patients with Ankylosing Spinal Disorders. May 2010; *Spine*

**Bransford RJ**, Zhang F, **Bellabarba C**, **Lee MJ**: Treating Thoracic Disc Herniations: Do We Always Have to Go Anteriorly? May 2010; *Evidence-Based Spine-Care Journal*

Elgafy H, **Bransford R**, McGuire R, Dettori J, Fischer D: Blood Loss in Major Spine Surgery: Are There Effective Measures to Decrease Massive Hemorrhage in Major Spine Fusion Surgery? April 2010; *Spine*

**Bransford R**, Zhang F, **Bellabarba C**, Konodi M, **Chapman JR**: Early experience treating thoracic disc herniations using a modified transfacet pedicle-sparing decompression and fusion. Mar 2010; *J Neurosurg Spine*

# *Recent* FACULTY PUBLICATIONS

**Cavanagh PR, Genc KO**, Gopalakrishnan R, Kuklis MM, Maender CC, **Rice AJ**: Foot forces during typical days on the international space station. May 2010; J Biomech. PMID: 20462584

Van Middendorp JJ, Audigé L, Hanson B, **Chapman JR**, Hosman AJ: What should an ideal spinal injury classification system consist of? A methodological review and conceptual proposal for future classifications. May 2010; Eur Spine

Dekutoski MB, Norvell DC, Dettori JR, Fehlings MG, **Chapman JR**: Surgeon perceptions and reported complications in spine surgery. Apr 2010; Spine

Dettori JR, Norvell DC, Dekutoski M, Fisher C, **Chapman JR**: Methods for the systematic reviews on patient safety during spine surgery. Apr 2010; Spine

Andersson GB, **Chapman JR**, Dekutoski MB, Dettori J, Fehlings MG, Fourney DR, Norvell D, Weinstein JN: Do no harm: the balance of “beneficence” and “non-maleficence.” Apr 2010 ;Spine

Mehta S, Mirza AJ, **Dunbar RP, Barei DP, Benirschke SK**: A staged treatment plan for the management of Type II and Type IIIA open calcaneus fractures. Mar 2010; J Orthop Trauma

**Gross TS, Poliachik SL**, Prasad J, **Bain SD**: The Effect of Muscle Dysfunction on Bone Mass and Morphology. J Musculoskeletal Neuronal Interactions. 2010; 10(1):25-34

**Hanel DP**, Ruhlman SD, Katolik LI, **Allan CH**: Complications associated with distraction plate fixation of wrist fractures. May 2010; Hand Clin

Noble LD Jr, Colbrunn RW, **Lee DG**, van den Bogert AJ, Davis BL: Design and validation of a general purpose robotic testing system for musculoskeletal applications. <<http://www.ncbi.nlm.nih.gov/pubmed/20370251>> Feb 2010; J Biomech Eng: 132(2)

**Mosca VS**: Current Concepts Review: Flexible flatfoot in children and adolescents. 2010; J Child Orthop: 4:107-121

Gardner MJ, **Nork SE**, Huber P, **Krieg JC**: Less rigid stable fracture fixation in osteoporotic bone using locked plates with near cortical slots. Jun 2010; Injury

Calafi LA, **Rouff ML**: Direct hip joint distraction during acetabular fracture surgery using the AO universal manipulator. Feb 2010; J Trauma

Kratz AL, Williams RM, Turner AP, Raichle KA, **Smith DG**, Ehde D: To lump or to split? Comparing individuals with traumatic and nontraumatic limb loss in the first year after amputation. May 2010; Rehabil Psychol

**Tadepalli SC**, Shivanna KH, Magnotta VA, Kallemeyn NA, Grosland NM: Towards the Development of Virtual Surgical Tools to Aid Orthopaedic FE Analysis. Jan 1, 2010; Special Issue in Image Processing and Analysis in Biomechanics, EURASIP Journal in Advances in Signal Processing, 1902931-1903937

## *Conference Abstracts:*

**Srinivas C. Tadepalli**, Ahmet Erdemir, **Peter R Cavanagh**, A Comparison of the Performance of Hexahedral and Tetrahedral Elements in Finite Element Models of the Foot, ASME Summer Bioengineering Conference, June 16-19, 2010, Naples, FL

**Srinivas C. Tadepalli**, Ahmet Erdemir, Subham Sett, **Peter R Cavanagh**, A Comparison of the Performance of Hexahedral and Tetrahedral Elements in Bone-SoftTissue Finite Element Models, The Annual meeting for the American Society of Biomechanics, August 18-21, 2010, Providence, RI

**Srinivas C. Tadepalli**, Ahmet Erdemir, Subham Sett, **Peter R Cavanagh**, A Comprehensive Comparison of the Performance of Hexahedral and Tetrahedral Elements in Finite Element Models of the Foot, International Foot and Ankle Biomechanics (i-FAB) Conference, September 16-18, 2010, Seattle, WA

**JULY 4** IS THE WORST DAY OF THE YEAR FOR A HAND SURGEON ON CALL. IN SEATTLE, UP TO A DOZEN PATRIOTIC PYROS WILL SET OFF FIRECRACKERS IN THEIR OWN HANDS. CAN THEIR DIGITS BE SAVED?  
 AND, COME TO THINK OF IT ---

HOW D'YA DO THAT?  
 BY Ellen Forney  
 ©2001

# HOW D'YA SEW AN AMPUTATED FINGER BACK ON??



UW PROFESSOR OF ORTHOPEDICS  
 & HARBORVIEW HAND SURGEON

Dr. Doug Hanel

(O-KAY, IT'S "HANEL," NOT "HAND") HAS REATTACHED OVER 100 FINGERS IN HIS CAREER. (DR. H. ALSO USES HIS OWN FINGERS TO SAIL, KAYAK, AND PICK OUT DOOBIES TUNES ON HIS GUITAR.) HE EXPLAINS "DIGIT REPLANTATION"...

Microvascular surgery.

## TYPES OF INJURY:

**1 GUILLOTINE**  
 a clean cut, as with a sharp knife.

**2 MEDIUM LEVEL GUILLOTINE**  
 most common type, as with a circular saw.

**3 COMPRESSION**  
 pinched off, as in a hinged door.

**4 AVULSION**  
 pulled off, like Neil Armstrong, who caught his finger while jumping over a fence.

**5 EXPLOSION**  
 say, blown off by a firecracker.

PRESERVE PART. GO TO HOSPITAL.

IN O.R., THE SURGEON ASSESSES THE AMPUTATED PART AND "STUMP" (← correct medical term!) TO DETERMINE IF THERE ARE ENOUGH COMPONENT PARTS (arteries, veins, etc.) TO SEW IT ALL BACK TOGETHER.

AMPUTATION IS "REVISED."

WOUND IS MADE CLEAN, DANGLING PARTS ARE REMOVED, FINGER GOES TO HEAVEN.

TEENY TINY MICROSURGERY TAKES 4-6 HRS PER FINGER.

- FIRST, BONES ARE CONNECTED WITH WIRES, SCREWS, NAILS, PAPER CLIPS...
- TENDONS ARE SEWN TOGETHER...
- ARTERIES + VEINS ARE SEWN TOGETHER...
- NERVES ARE SEWN TOGETHER...
- LAST, THE SKIN IS SEWN TOGETHER.

5 HEAVILY-SEDATED DAYS IN HARBORVIEW'S "Tropicana Room," KEPT HOT TO INCREASE BLOOD FLOW.

PHYSICAL THERAPY, MAYBE MORE SURGERY, WEIRD DREAMS.

## MOST LIKELY OUTCOME FOR EACH TYPE OF INJURY ABOVE:

**1** • SCAR  
 • SLIGHTLY SHORTENED DIGITS  
 • SOME LIMITED MOTION + SENSATION

**2** • BIGGER SCAR  
 • SHORTER DIGITS  
 • LESS MOTION + SENSATION

**3** • SCARY SCAR  
 • SHORT SHORT DIGITS  
 • LIMITED MOTION + SENSATION

**4** REPLANTATION IS EXTRA-DIFFICULT BUT, IF SUCCESSFUL:  
 • BIG SCAR • SHORT DIGITS  
 • MARKED LOSS OF MOTION + SENSATION

**5** REPLANTATION NOT POSSIBLE. TOE TRANSFERS DONE FOR THUMBS + MULTIPLE DIGIT AMPUTATIONS.

REMEMBER, KIDS --- Safety FIRST!!