



WHS Newsletter

The Wound Healing Society

Volume 2 Issue 3

President's Message

by Luisa Ann DiPietro, DDS, PhD



Dear WHS Members,

It's truly a pleasure to provide this news update from the helm of WHS, because from where I sit, almost all of the news from WHS is good news. WHS remains an energetic and growing organization. Despite challenging economic times, our finances are healthy and membership is still very high. Our journal, *Wound Repair and Regeneration*, continues to thrive under the direction of Editor-in-Chief, Dr. Pat Hebda, having experienced yet another increase in impact factor. WHS also successfully launched the first volume of our annual WHS Yearbook: *Advances in Wound Care*, a book that was produced with the help of many Society members and under the expert editorship of Dr. Chandan Sen. Our upcoming meeting, organized by Program Co-Chairs Dr. Marjana Tomic-Canic and Dr. George Perdrizet, promises to be a terrific venue to learn about the latest in wound healing science and to network with others in the field. (You can read the exciting details of the meeting elsewhere in this newsletter). Our website is continually updated to serve you. For example, members who have research labs should check out our brand new research lab listing at <http://www.woundheal.org/mc/page.do?sitePageld=101546&orgld=whs>. Please consider adding your lab to our growing network.

Clearly, there are many good things happening at WHS, and I want you to know that there are many more to come. In late October, the WHS Board of Directors met for a one-day Strategic Planning Meeting to discuss WHS and to plan for the future. The Board of Directors were energized by this experience, as we discussed all of the ways that WHS can best promote the science of wound healing and its translation to clinical practice. We came away from the meeting very excited about working to make WHS a dynamic organization that promotes interactions among our members in exciting ways. Some of the ideas that were discussed included connecting members in new ways, such as newsgroups, discussion boards and other means of electronic exchange. The enhancement of networking and person-to-person interaction at the annual meeting was another hot topic that we discussed. The upshot of our meeting was that the Board agreed that the overall goals of WHS are the same as those that were identified by our "founding fathers." WHS should be a vibrant society that promotes interaction and collaboration among our members. The Board is committed to making WHS the very best society for the promotion of the science of wound healing and its clinical translation.

So.....while WHS is doing a great job right now, we all want it to be better. As we move into next year, the WHS leadership will be engaging you, our members, to learn more about how WHS can best support you. We all look forward to hearing your thoughts as we develop new initiatives and structure so that we can truly be the best.

Thank you for your continued support and membership in WHS. Please feel free to contact me anytime at Ldipiet@uic.edu with your thoughts or questions.

Luisa

Please remember to renew your membership before December 31, 2010 at www.woundheal.org.

The Wound Healing Society

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www.woundheal.org



Table of Contents

Presidents Message	1
WHS 2011 Annual Meeting	2
For Lillian	5
Committee Reports	6
Blast From the Past	7
You Might Want to Know	8
<i>About the Global Diabetes Epidemic</i>	
Contemporary Topics	10
<i>Advice on How to Succeed as a Junior Clinician Scientist</i>	

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WHS Annual Meeting, 2011

Dallas, Texas

April 14-17

Program Co-Chairs, Marjana Tomic-Canic, PhD, and George A. Perdrizet, MD, PhD, FACS

The Program will feature many new and exciting topics and new basic science and translational breakthroughs.

We will also be holding two pre-conference workshops:

“Pre-clinical Models of Wound Healing” will examine the current use of animal and human models to study wound healing, with emphasis on the specific use--basic science and/or clinical & translational. Part One of this session will review the models used for basic research, those that are more “translational”; and further, models that are IND-enabling and FDA-required. Part Two will be a panel discussion that aims to define the limitations and practical use of each model. It is hoped that this open discussion format results in a White Paper with WHS recommendations of the utilization of pre-clinical models of wound healing towards the specific purpose. Because it is a brainstorming session, no CME accreditation will be given. Participation is free, but requires registration. For Registration Information, contact Lyn Henderson at lyn@crowsegal.com.

“From Discovery to Therapy” will continue the translational theme and provide basic information from academic, regulatory (FDA), and industry perspectives of the process of technology transfer. This session will highlight the hurdles, typical errors, myths, and biases regarding the process from initial discovery to actual clinical development.

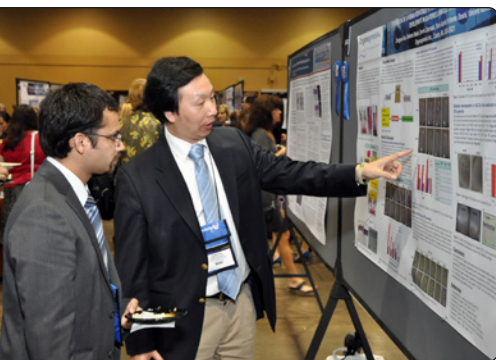
Keynote Speaker, Dr. Angela M. Christiano

*Richard and Mildred Rhodebeck Professor of Dermatology Professor of Genetics & Development
Director of the Basic Science Research Group
Columbia University College of Physicians and Surgeons.*

Dr. Christiano is a world leader in the areas of skin genetics and biology. She will discuss approaches to genetic therapies for skin and hair diseases and their applications to wound healing.



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General Plenary Sessions: Pioneering Advances in Regenerative Medicine,

Michaele DeLuca, MD

*Director of the Centre for Regenerative Medicine,
"Stefano Ferrari" University of Modena
and Reggio Emilia, Italy*

Dr. DeLuca will discuss success in using cultures of limbal stem cells in the treatment of the human cornea burn wounds.

Rocky S. Tuan, PhD

*Director of the Center for Cellular and Molecular Engineering,
Department of Orthopaedic Surgery
University of Pittsburgh School
of Medicine*

Dr. Tuan will discuss the successful approaches to using adult stem cells in restoration of function to musculoskeletal tissues.



Ian McNiece, PhD

*Director of the Experimental and Clinical Cell-Based Therapies Program of the
Interdisciplinary Stem Cell Institute
University of Miami Miller School of Medicine*

Dr. McNiece will discuss the successful use of allogeneic stem cell therapy for repair of damaged cardiac tissue.



Other Plenary sessions will cover myriad topics, including:

- Biology of Chronic Wounds**
- Ageing, Cellular Senescence and Wound Healing**
- Biofilms and Mechanisms of Host Response**
- Progenitors in Wound Healing**
- Repair vs. Regeneration.**



WHS has teamed with the Cell Stress Society International

to present a joint session on the topic of Cellular Response to Stress and Wound Healing. The list of speakers includes Aristides Veves, Sabine Eming, Matthew Hardman, Judith Campisi, Richard Galo, Julie Segre, Wei Li, Pampee Young, Georg Wondrak, and many others.

WHS 2011 Honoring the Efforts of Young Researchers

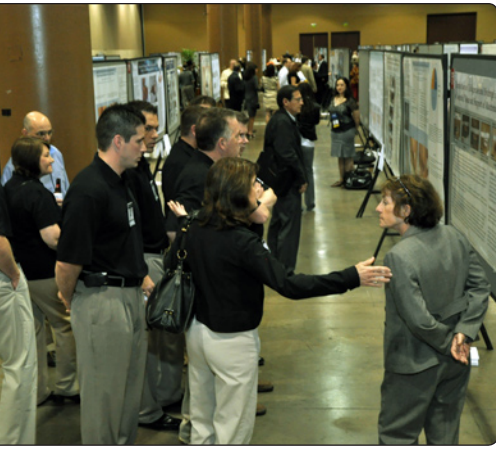
We will feature the research of junior investigators from the top selected abstracts in our Young Investigators Plenary Session.

"Meet the Mentors"

Traci Wilgus, PhD, and Tai-Lan Tuan, PhD, will coordinate the session, which will provide focused group interactions with our leaders discussing various topics related to grantsmanship, job application, academic mentorship, tenure process, and much more.



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Upcoming Meetings

**American Society for
Cell Biology**
December 11-15
Philadelphia, Pennsylvania

**Australian Wound and
Tissue Repair Society**
March, 2012
New South Wales

**Canadian Association
of Wound Care**
November 4-7
Calgary, Alberta

**European Society for
Tissue Repair**
September 15-17
Gent, Belgium

**Japanese Society for
Surgical Wound Care**
September 2-7, 2012

The International Session, led by Laura Parnell and Andrew Baird, will welcome top scientists from other sister societies and focus on "Pain and Neural Impact on Wound Healing."

WHS2011 Abstract Submission is in Progress.

Deadline December 13, 2010 at midnight, EST. Top selected abstracts will be presented in the Concurrent Mini-symposia Sessions

Poster Talk Sessions

Praveen R. Arany, MD, PhD, DDS, and Kenneth Finnson, PhD. The concept is that in a moderator-guided tour, selected posters will be presented and discussed in a 7+3 minutes format.

WHS/SAWC Symposium on Advanced Wound Care April 14-17, 2011

Meeting Registration Information

Lyn Henderson, 407-647-8839, lyn@crowsegal.com

Hotel Registration Information

Gaylord Texan Resort & Convention Center, Dallas, TX
817-778-2000 or Toll Free: 866-782-7897
www.gaylordhotels.com/gaylord-texan/



The Wound Healing Society

WHS Profile

For Lillian

by Susan Opalenik & Jeffrey Davidson

On meeting Lillian Nanney, you are immediately disarmed by her Southern charm, her warm smile, and her wonderful, native Tennessee inflection. As the conversation continues, you quickly begin to realize that Lillian is speaking and thinking far too quickly to be accused of having a drawl. Her energetic, positive and sensible attitude leads you rapidly to adjust your impression and realize the depth and breadth of her intellect. She is a very motivated, focused, accomplished, and dedicated scientist, teacher, and administrator.



Lillian has been a pioneer at Vanderbilt, being the first woman to hold a faculty position in the Department of Plastic Surgery. We each were drawn into collaboration by our mutual interest in wound healing, animal models, and growth factors. By the mid 80's, Lillian's lab had already developed significant experimental and analytical tools for the study of burns and wounds in humans and pigs, with active collaborations in her home department of Plastic Surgery as well as with groups in Cell Biology and Dermatology. Lillian has continued to maintain those affiliations, enabling her to investigate preclinical and clinical aspects of wound healing with equal skill. If you have a question about a "pig" – Lillian will have an answer.

Lillian is truly dedicated to graduate and medical education, training and University service. She has taught anatomy to wide-eyed, first-year medical students for years with great patience and devotion. This aspect of her talents has grown into a Professorship in Medical Education and Administration, not to mention that she is one of a select group of Master Teachers on the Vanderbilt School of Medicine Faculty. Lillian has also given a great deal of her time and energy to committee work at Vanderbilt, including her recent appointment to the faculty senate. Moreover, she has trained, taught, and mentored dozens of students and fellows. If that weren't enough to fill her days, she also established and, until this year, operated a busy and successful immunohistochemistry service for both the Vanderbilt Skin Diseases Research Center and the Medical Center at large - something had to give.

She is of course well known to the Wound Healing Society for her leadership and service including: president, meeting organizer, board member - twice, as well as an associate editor of *Wound Repair and Regeneration*. Lillian has good judgment, wisdom, patience, and dedication to the principles upon which the Society was founded as well as the changing needs of the membership. She has shown vision while ensuring the WHS stays on a steady course towards fulfillment of its scientific, community, and educational objectives.

On a more personal note, Lillian is a native Tennessean and has called the Volunteer state her home except for her years in graduate school in Baton Rouge at LSU. Her loyalty to Vanderbilt extends back to her baccalaureate days. Along the way, she married her Clarksville Tennessee high school sweetheart, Steve. They have two children, son Gregory - an artist, and daughter Sarah who is following in her mothers pioneering footsteps and works as a Pediatric Nurse Practitioner at The Monroe Carrell Jr. Children's Hospital at Vanderbilt. Lillian is also the proud grandmother to grandsons Wyatt and Winston. In her "free time" away from her positions in academia and as wife, mother, and grandmother, Lillian also enjoys gardening, shopping, and is an avid reader. She is also very involved in the charitable projects of her church congregation. We all know Lillian for her passionate enthusiasm, and a little known, but interesting fact about Lillian is that she LOVES blackberries. Consider that the next time you need a favor.

You certainly get the impression by now that Lillian generally only knows one speed: full steam ahead! Her only recent setback was an unplanned tumble off the back porch at home on Thanksgiving in 2008, when her rush to retrieve her grandson's high chair resulted in a slip on the ice and a long, painful personal wound healing and tissue remodeling experiment for an injured ankle. Needless to say, she's back in form and making progress on all fronts.

Despite all the usual frustrations of developing an academic career while balancing personal life, Lillian does it all with a smile, an incredibly positive attitude, a remarkable level of industriousness and productivity, and a sympathetic ear. Her enthusiasm and energy are infectious and stimulating to all of us who have had the good luck to work with her in a variety of settings. If you ever have the opportunity to sit and chat with Lillian, take it - you will be enriched by the experience. We have.

WHS Committee Reports

Education Committee

By Aamir Siddiqui, Chair

The education committee is committed to advancing the education mission of the WHS. We continue to have success with the Basics of Wound Care course. In addition to the annual presentation at the SAWC Spring meeting, we have been invited to present again at the annual American Geriatric Society Meeting. For advanced learners we are developing a webcast on cutting edge topics. These presentations are available to members through the WHS website. Please send topic suggestions or comments to Aamir Siddiqui MD at asiddiq1@hfhs.org.

Website Committee

By Kris Kieswetter, Chair

The website committee has been meeting regularly to evaluate the roll out of the new look and to assess what additional features and/or benefits that can be provided to the membership through this medium. A special thank you goes out to the individuals who have performed "Web Patrol" duties over the past few months: Bob Diegelmann (June), Traci Wilgus (July), Nicki Waters (August), Corrie Gallant-Behm (September), Luisa DiPietro (October) and Manuela Martins-Green (November). During their respective month, each of these individuals regularly reviewed the website, validated that links were still appropriate and active and made suggestions for improvements. A recent improvement has been the increased functionality added to the "Committees" area. Committee members can now share, work on and store documents in this space rather than having to try to keep track of various versions that are being worked on and shared via email. Furthermore, keeping documents in this space will assist WHS in archiving our efforts and maintain our corporate knowledge. In November, the committee began assessing analytics from the website (number of page views and length of time each page is viewed). It is expected that baseline metrics will be established over the next few months. New additions or changes to the website will then be assessed relative to these baselines. Feedback and suggestions from the membership is encouraged and can be sent to info@woundheal.org or kieswetk@kci1.com.

Awards Committee

By Manuela Martins-Green, Chair

The awards committee is hard a work. We are in the process of preparing the nomination list for the Anita Roberts Award to submit to the Board of Directors for the final decision. We have sent out the request for nominations for the WHS Distinguished Service Award and will soon be sending out the request for application for the Junior Faculty Travel Awards. In the next couple of month, we will be preparing for the judging at the meeting of the Young Investigators Award and for the Industrial Research & Development Poster Awards previously called Blue Ribbons Poster Awards.



The Wound Healing Society

From the Editor

by Manuela Martins-Green

The Holidays are here: Hanukkah, Christmas, Kwanzaa to cite a few. It is time to celebrate, to get together with family and friends, to reflect upon the events of the year. During this 2010 season it is particularly difficult to engage in festivities as we all know that many of our countrymen have lost their jobs, their homes, and by now, maybe even food on the table. I invite you to reflect upon the events of the day, the events of the week, the events of the month, the events of the year and vow to take a step, small as it may be, to lend a hand to someone in need.

**Happy Holidays full of Peace
and Good Health**

Program Committee

by Marjana Tomic-Canic, PhD and George A. Perdrizet, MD, PhD, FACS, Co-Chairs

Program Committee was very active this fall developing the program for the WHS 2011 Meeting. These activities included selection of the topics and speakers as well as moderators. In addition, we have worked on logistics issues that would provide extension of the Abstract submission deadline. We are happy to report that we were able to push back the submission deadline for almost 6 weeks. The new deadline will be December 13th 2010. We are very grateful to Dr Pat Hebda (Editor in Chief for *Wound Repair and Regeneration Journal*) and Mindy Hoo (Crow-Segal) who were very helpful and made this possible. Development of one of the sessions capture the most of our attention. This year, we decided to initiate an "open floor discussion" session format that will focus on Pre-clinical Models for wound healing. As many of you know, the choice of the animal model directly influences the outcome and defines the value of the data. The selection of the appropriate model depends on what is the purpose: basic science, translational research, pre-clinical

testing for IND or FDA, to name a few. In the field that relays so much on animal models there is a greater need to standardize them. The diversity of research and multitude of models point out that there is no simple solution and "one fits all" approach. Therefore, committee decided to bring this topic as an open dialogue with hope to formulate a white paper document summarizing the models and their potential use. This year, we will start with overview of major models, but we envisioned that perhaps we can use a more focused approach in subsequent years and discuss specific topics, such as models for fibrosis/scarring, chronic wounds etc. Dr Andrew Baird and Jeffrey Davidson will be leading this year's pre-conference session. It will contain a didactic component (a comprehensive review of the models) followed by the panel discussion. Participation will require registration, but will be free of charge. For additional Program details please see our extended report in this issue.



Blast From The Past

by Bob Diegelmann

David Davenport (left), received the Wound Healing Society's first Distinguished Service Award in 1994 for his outstanding legal work to get the society started by developing our by-laws and to become incorporated. Mr. Davenport received his law degree from George Washington University National Law Center, Washington, District of Columbia in 1968. He has a long list of honors and has arbitrated cases in Virginia, the District of Columbia, the U.S. Court of Appeals for the Armed Forces, the U.S. Tax Court and the U.S. Supreme Court. David has a personal interest in problems associated with diabetes and abnormal wound healing and was very willing to provide all of his hard work pro bono.



David Davenport (left), received the Wound Healing Society's first Distinguished Service Award

You Might Want to Know

About the Global Diabetes Epidemic

by Nikki Waters

For the first time in two centuries, the current generation of children in America may have shorter life expectancies than their parents (NY Times Mar '05).

Half of all Americans will have diabetes or pre-diabetes by the year 2020 (LATimes Nov '10).

What implications do alarming headlines such as these have for those of us involved in wound healing?

According to the World Health Organization, chronic diseases are the leading cause of disability and represent 60% of all deaths worldwide (1). As the numbers continue to increase dramatically, it is not only health care organizations that are paying attention to these figures. In January 2010 from the World Economic Forum identified "chronic diseases and their impact on both advanced economies and developing countries" as one of the most significant global risks for the next decade (2).

The statistics related to diabetes mellitus are especially shocking. A tenfold global increase in incidence in the past two decades means that currently, about 6% of the adult population has the condition. Even more concerning is the fact that for the first time children as young as eight are now being diagnosed with type 2 diabetes and in high risk populations including some Native and Aboriginal communities in the United States, Canada and Australia as many as 1 in 25 youth have the disease(3).

- The CDC reports that diabetes mellitus currently affects an estimated 24 million people in the U.S. (4).
- Additionally more than six million are unaware they have the disease (4).

Medical costs for people with diagnosed diabetes are more than double those of individuals without the disease. The Canadian Diabetes Association estimates that when the social impact related to mortality and morbidity is taken into account, medical costs represent only 17% of the total economic burden of diabetes (5). A recently released study estimates U.S. health spending associated

with diabetes and pre-diabetes at about \$194 billion this year (approximately seven percent of total U.S. health spending). These figures are projected to rise to \$500 billion by 2020(6).

Several factors have combined to create the current situation. While epidemics of the past have generally been associated with communicable diseases, the exponential increase in diabetes is being driven largely by alterations in diet and activity levels. On a global level, rapid cultural changes, aging populations, increasing urbanisation, and other unhealthy lifestyles have also contributed (3).



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As with other systemic diseases, it is well documented that diabetes can significantly influence how long a wound will take to heal, or whether it will heal at all. In fact, over 100 known physiologic factors have been identified which may contribute to impaired wound healing in individuals with diabetes (7). Although these can affect any stage of the wound healing process and all types of wounds, patients with diabetes are at particular risk for wounds related to diabetic foot disease. A perilous combination of neuropathy, peripheral vascular disease and trauma, further compounded by an impaired

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immune response means that the lifetime incidence of diabetic foot ulcers (DFUs) has been estimated as high as 25% and the majority of non-traumatic limb amputations are the result of diabetes complications (5,8).

While optimal treatment care of DFU's includes debridement, off-loading, local wound care, and if applicable, treatment of infection (9), these interventions often involve considerable disruption to patients' lives. The fact that the fastest growing incidence of diabetes is in the working-age population



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means that an increasing number of individuals are facing significant challenges associated with managing diabetic foot disease in the workplace. A recent survey of DFU patients found that in some instances they were forced to make near-impossible choices between following treatment protocols and maintaining employment (10).

Although extensive global efforts are underway to turn the tide of the diabetes epidemic, as new cases continue to appear and as people with the disease are living longer it is clear that in the foreseeable future we can continue to expect a steady increase in the number of diabetic patients with foot ulcers and other chronic wounds.

What are wound care professionals doing to meet these challenges?

Are you making changes in your practice to improve the current situation?

Are you currently working on research in this area?

Are you a patient living with a diabetic wound?

Do you have any diabetes-related ideas and suggestions?

At WHS we invite you to share your thoughts, opinions and insights on this pressing issue.

(1) http://www.who.int/nmh/publications/ncd_action_plan_en.pdf

(2) <http://www.weforum.org/pdf/globalrisk/globalrisks2010.pdf>

(3) [http://www.worlddiabetesfoundation.org/media\(9339,1033\)/MEDIA_DiabetesInTheDevelopingWorld_may2010.pdf](http://www.worlddiabetesfoundation.org/media(9339,1033)/MEDIA_DiabetesInTheDevelopingWorld_may2010.pdf)

(4) CDC 2010 <http://www.cdc.gov/media/pressrel/2010/r101022.html>

(5) <http://www.diabetes.ca/economicreport/>

(6) http://www.unitedhealthgroup.com/hrm/UNH_WorkingPaper5.pdf

(7) Brem H, Tomic-Canic M. (2007). Cellular and molecular basis of wound healing in diabetes. *J Clin Invest.* 117(5):1219-22.

(8) Singh N, Armstrong DG, Lipsky BA. (2005). Preventing foot ulcers in patients with diabetes. *JAMA.* 293(2):217-28.

(9) Wu, S.C., Driver, V.R., Wrobel, J.S., Armstrong, D.G. (2007) Foot ulcers in the diabetic patient, prevention and treatment. *Vasc Health Risk Manag.* 3(1):65-76.

(10) Waters N., Holloway S., (2009) Personal perceptions of the impact of diabetic foot disease on employment. *Diabetic Foot Journal.* 12(3):119-131.



The Wound Healing Society

Contemporary Topics

Advice on How to Succeed as a Junior Clinician Scientist

By Robert D. Galiano, MD, Thomas A. Mustoe, MD, Nicole Gibran, MD

The classical paradigm of the “triple-threat” in academic medicine – the superstar who excels at clinical medicine, teaching, and bench research – is still the model most junior investigators aspire to. However, this standard is under assault on a variety of fronts. Conversations with other junior colleagues at meetings and in the hospital reinforce our impression that it has become much more difficult to be able to excel at all three of these lofty goals. Now more than ever, attainment of these traditional markers of academic success requires excellent planning, a high degree of individual commitment, and extraordinary institutional support. In this report we will examine some of the difficulties faced by junior clinician-scientists and propose some strategies to deal with these roadblocks.

IS THE CLINICIAN-SCIENTIST A DYING BREED?

The NIH has recognized for some time that the junior clinician-investigator is in jeopardy, and this is evidenced by trends in R01 funding. While more M.D.s are being produced, grant applications from PhDs now outnumber grant applications from MDs by a ratio of 3:1. The NIH Directors Awards and preferential treatment of junior investigators during scoring of grant applications has been one attempt to reconcile this, as was the development of K30 clinical research curriculum awards to institutions and K23 patient-oriented research career development awards. However, much more can be done. These extraordinary commitments (among others spearheaded by the NIH) are only effective if medical school graduates actually commit to a career in clinical research. The data on the success rate of R01 resubmissions suggests that there is a significant attrition rate among clinician investigators who are not successful with their initial R01 grant submission, implying that there is a sense of resignation and perhaps a sense of

insurmountable adversity among these physicians. It is worthwhile in this regard to look at some of the challenges faced by clinicians who wish to commit to and flourish in patient-centered research.



BARRIERS TO ENTICING AND RETAINING CLINICIANS IN SCIENTIFIC RESEARCH

Perhaps the greatest hurdle to the clinician-scientist is the demand (and allure) of the clinic. This is in some ways a paradox, as it is the clinical insights brought to bear on a scientific problem that makes clinician scientists valuable in the research landscape. Similar to other trades, medicine is an experiential profession. As Atul Gawande and others have written, complications in medicine occur from a variety of systems errors, and one of them is that institutions (and by this it is meant mostly physicians) who perform less of a certain procedure

are much more likely to have increased numbers of complications and poorer overall outcomes than high-volume institutions and providers. It is said that good judgment only comes from the mistakes we make from exercising poor judgment, and this is particularly true in surgery. The number of cases to become proficient in a complex surgical procedure is said to range from 10 to 50, and these numbers are rarely attained during surgical residency. Hence, a steady amount of clinical practice volume is essential to develop and maintain clinical skills. This is also apparent in wound healing: you can only become adept at caring for wounds by seeing, treating, and following hundreds of wound patients. This time, of course, must compete with the time required to perform research!

Financial pressures also threaten the clinician-scientist model, both at an individual as well as

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institutional level. Budgets in clinical departments are under severe strain to a degree that is unprecedented throughout the last 50 years. Much fewer discretionary funds are available to support clinician-scientists during the first years prior to the first application for an NIH grant, while more pressure is placed on all clinical faculty to contribute to the bottom line. This can lead to tensions between clinicians who perform research and their colleagues who do not. Personal debt is also a dominant issue, widely acknowledged to be a pre-eminent contributing factor to the decline in physician scientists but difficult to determine as to how exactly this impacts retention and recruitment of aspiring clinician scientists. Medical students who graduated in 2009 accumulated an average of \$156,000 in student loan debt. By the time one finishes clinical and research training, a junior clinician investigator will be entering the prime years of his or her life with the equivalent of a mortgage, but this is also a time when families are started, children need to go to school, and a home needs to be financed. It is not surprising that the lower salaries associated with a clinician scientist career, conjugated with a heavy debt load, will inevitable discourage time spent in research, which (as any basic scientist will tell you) is not compensated as much as time spent seeing patients and performing procedures. The demands of the RVUs will inevitably trump the pursuit of the R01 when such pressures are brought to bear.

RECOMMENDATIONS:

While there are nationwide initiatives (a la the NIH programs mentioned above) and varying degrees of institutional attention to this problem, it is our belief that there are some approaches and recommendations that can help the clinician-investigator.

Training must be appropriate, and of long enough duration, to produce a trainee able to compete for research funding. It is naïve to expect to be able to compete with Ph.D.s for grants, much less comprehend the growing tools of basic science research advances, unless one has dedicated an adequate period of time to training. Preferably, this time should be during medical school as well as during residency, ideally toward the end of training. One of us (NG) informs graduates that a postdoctoral fellowship after residency is an ideal time to dedicate to preparing for an independent research position.

There must be protected time for research. The time required or available may vary between individuals

and specialties, but the fact is it is much less likely for the scientist half of the clinician-scientist to succeed if a meaningful amount of time is not devoted to science. Time should be spent in the lab, interacting with the personnel, meeting with other scientists in the institution, and writing proposals and grants. Committee work should be monitored closely, and the young faculty mentor must be able to say “no” to committee demands that impinge excessively on the research time. There are only so many hours in the day, and between clinical commitments and a healthy family life, research time must be viewed as a precious resource.

Other metrics of success should be recognized. With NIH grant success rates hovering in the low teens, it may not be feasible for all junior investigators to obtain an NIH grant in 2-3 years. It may be possible that 5 or even 6 years may be needed before an NIH grant is successfully funded. Furthermore, other sources of research success should be recognized by promotion and tenure committees. For example, industry-sponsored clinical trials demand a significant infrastructure and can feed other research studies; department-funded translational studies are also another means of performing research. However, the sine qua non of research success for most remains the NIH grant.



The clinician-scientist must have real financial support: the funds provided must be sufficient to enable an independent career. It does not serve anyone's purpose to higher a faculty member, and then not provide him or her with the necessary funds, lab resources, and personnel to forge what is essentially a start-up business.

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Time and organization skills must be actively developed. The Howard Hughes Medical Institute offers a guide to setting to preparing for and setting up a new laboratory for fresh investigators, and offers much useful advice (<http://www.hhmi.org/resources/labmanagement/moves.html>). Some themes are important. Time is the most important asset you have – do not squander it. Have a priority list of things that have to be done that day, that week, and upcoming deadlines up to a year away. These should include obvious deadlines such as meeting abstract deadlines and grant time schedules, but also may include a master plan for meeting tenure requirements and rank promotion. Carve out a regular time to meet with the research personnel in your lab. We routinely meet with our students and lab workers at early morning hours (5:30 AM – 7:00 AM) because that is time that is protected. It is important to keep a dialogue open between your research staff, and having regular meetings is an important way of steering your mentees and reminding them that you are as engaged in the lab as they are.

Take advantage of society courses on grantsmanship and career planning. For example, the American College of Surgeons and the Association for Academic Surgery provide courses on fundamentals of research that are useful even if you think you know the basics!

Network with people within your institution as well as in other institutions. There are 2 particularly valuable advisors that can provide pearls of wisdom in succeeding. The first is the more elder statesman, usually in your Department, who has an established track record as a physician scientist. The second is a more junior investigator who has just recently achieved promotion to an Associate Professor level. This “junior mentor” will often have the most keen and practical insights in how to navigate the research hurdles particular to your institution, and may even be willing to provide advice as to which Committee responsibilities to avoid and which are genuinely helpful, which collaborators are useful and collegial, and will in any instance serve as an inspiration that it is possible to have a clinical career and perform research in this day and age!

Collaborators are absolutely essential to succeed. In fact, this may be part of any model for research success. A strategic collaboration between a clinician scientist and a basic scientist is a way of partnering the skill sets of these two different types of scientists.

At Northwestern, for example, our lab is run by a senior clinician scientist and a more junior surgeon-scientist together with a basic scientist who has an interest in patient-oriented research. Since the basic scientist does not have clinical responsibilities, he is more able to address the day-to-day experimental troubleshooting with technical aspects of bench experiments, whereas we ensure he does not feel exploited by ensuring that he shares senior co-authorship on papers and is encouraged to write independent research grants. For this arrangement to work, there has to be a high degree of trust and respect between the clinician scientists and the basic scientist – since each brings different skill sets to the table, we have found that this trust has evolved naturally.

Other models of research besides traditional “bench research” are available to the clinician-scientist. The burgeoning interest in translational and outcomes research may in actuality be a better fit for many recent graduates of our training programs. This requires a different manner of skill sets and know-how, but can be a tremendously beneficial application of the talents and curiosities of burgeoning clinician scientists. Clinical trials and Biodesign programs modeled after the Stanford initiative (www.innovation.stanford.edu) are means of engaging more translationally- and entrepreneurially-minded residents. Such programs are especially well suited for surgeons and wound healers, since much of what we do involves clinical endpoints. It is likely that fitting the research model with each trainee’s interests – basic science, translational, outcomes, or product design – is an optimal strategy of attracting the best minds of young clinician scientists and ensuring their retention within research.

CONCLUSION

As Vince Lombardi said, “the only place success comes before work is in the dictionary.” Becoming a successful clinician scientist is a demanding career path, but the rewards are immeasurable. The dreams we have of helping patients by advancing medical practice are what draws us to this challenge. Our other challenge, once we have succeeded, is to “pass it on” to the next generation of clinician scientists by serving as role models and mentors, and it is within this context that societies like the Wound Healing Society can facilitate networking and the exchange of ideas and advice through collegiality and a sense of shared purpose.