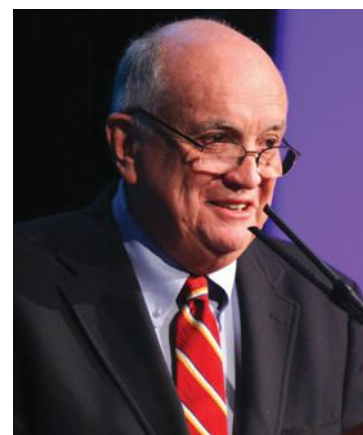


An Interview with **Dr. I. Kelman Cohen**

# A Wound Healing Leader:

## A Lifetime Journey to Determine How Wound Healing Works



Dr. I. Kelman Cohen

INTERVIEW BY Catherine Harley, Associate Editor, *Wound Care Canada*

**Dr. I. Kelman Cohen, MD**, is Professor and Chairman Emeritus, Division of Plastic and Reconstructive Surgery, Medical College of Virginia, Virginia Commonwealth University in Richmond, Virginia, and President of Tissue Technologies Holding LLC. He is a founder of the Wound Healing Society (WHS) and winner of a 2008 World Union of Wound Healing Societies Lifetime Achievement Award.

**Q What led you to become a plastic surgeon with an academic research focus on wound healing?**

In the early '60s, when I graduated from the University of North Carolina School of Medicine, I knew that I wanted to be a surgeon. I chose plastic surgery because it was the most diverse and challenging field of surgery that I could find. I then became extremely interested in wound healing because the problems were so severe and few people in health care were at all interested in solving the problems. At that time there was very little focus on molecular mechanisms of wound healing in general and chronic wounds in particular. Patients with chronic wounds were a huge challenge. There was an almost emergency need to figure out why wounds

became and remained chronic. I felt that I could make an impact on this space. Therefore, after I completed a plastic surgery fellowship at the Johns Hopkins Hospital in Baltimore, Maryland, I spent two years working at the National Institutes of Health (NIH), where I developed the proper basic science skills to carry out the wound-healing research I felt was so important.

**Q How did you become the Chief of Plastic Surgery at Virginia Commonwealth University?**

There was no plastic surgery at the university and they realized their need for it. Because of my background in research combined with my excellent clinical training, I was hired for the position. It was frightening to jump into a chairmanship at a very

young age, but the opportunity was one I could not turn down. It allowed me to establish my own division of plastic surgery rather than going to work for someone else.

**Q How was your plastic surgery department set up?**

The Division of Plastic Surgery was set up with a strong focus on both clinical plastic and reconstructive surgery and wound-healing research. I was able to bring a superb clinical teacher of plastic surgery with me as well as a full-time PhD for the lab. Soon we had grown to six clinically oriented plastic surgeons. In addition, several of the plastic and general surgical residents clamoured to join the lab for at least two years. Nurses played a major role in making both the clinical and research areas work

properly. In all of the sub-specialties in plastic surgery, there was a nurse assigned who was responsible for the day-to-day operations of the functional area.

**Q Tell us about the first-ever wound-healing centre in the United States that you established and how you connected it with an active research program.**

This Wound Healing Center, which was part of the Virginia Commonwealth University, was started in 1982. Mary Crossland was a young, experienced nurse with an ICU background who worked with me to get the clinical wound-healing program started. Mary played a key role because she was a good organizer who quickly grasped the challenges of patients with wounds.

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She also recognized the importance of translational research. I could never have done it without her. She managed the day-to-day clinical wound care. We saw a variety of wounds such as diabetic, venous and pressure ulcers. We were also a referral base for the area and often had some very obscure, complex wounds on patients who required assessment and diagnosis as well as treatment plans.

The PhDs from the Division of Plastic Surgery research program also spent time in the wound clinic so that they could relate the lab research projects directly to the patients and the tremendous difficulties they had with their wounds. We had started an active translational research program between the wound-healing lab and the clinical wound-healing centre. If we were going to improve the treatment of these wounds, we needed to learn what was making them abnormal biochemically so we could proceed with a logical form of treatment. There were no institutional review boards (IRBs) when we first started, which made it easier to get studies going. Now IRBs are standard when doing research—and these are important safeguards. We truly had a “bedside to bench” research process.

In the '70s, there were many biological phenomena that we did not have the technical ability to probe in the lab. In the '70s and '80s we couldn't measure many of the molecular events of

normal and abnormal healing. Today, there are new and innovative laboratory tools to measure what is really happening to alter healing. This allows us great opportunities to develop interventions to help the patient. Instead of taking our ideas from the bedside to the bench, we are now creating new treatments by going from the bench to the bedside with new products to treat our patients in a much better way.



**What is your philosophy about the role of nurses in the wound-healing clinic?**

Nurses specialized in wound healing are essential to the success of a wound-healing clinic. It was very clear to me that skilled nurses understand that you must treat the entire patient and their diseases and make informed decisions about what care plan should be implemented. Nurses are the key. They are very important in identifying problems and making sure that the problems are dealt with using a multidisciplinary approach.



**How did you get started in wound-healing research?**

I ended up doing two years of wound-healing research at the NIH in Bethesda, Maryland. I felt that although I had gained clinical experience, if I did not do that research I would not understand enough to make an impact to advance wound healing. I realized

that the only way I could make an impact in wound care was to understand what was going on at a molecular level. I had to get involved with the science of wounds so that I could understand collagen metabolism and proteases, which were just being looked at. I learned how to run assays so I could test various human wound tissues. Industry was not as involved in wound-healing research at that time, and we did not know what we know today about non-healing wounds. Understanding the wound is what made the difference for me.



**What type of research related to wound care have you been involved in?**

First I was involved in understanding biochemical events of normal wound healing and then defining the molecular events that make the chronic wound actually chronic. We were in one of two research centres in the world that researched elevated MMPs [matrix metalloproteinases] and elastase in chronic wounds and looked at other mechanisms involved. In the late '90s we teamed up with the Department of Agriculture with a method that can remove proteases from the wound. We have also looked at how to detect proteases at the bedside (point-of-care detection devices) so that the appropriate treatment can be used on chronic wounds.



**Tell me about the team at your wound-healing research laboratory in Richmond.**

The wound-healing research laboratory that I am currently involved with is located adjacent to the Medical School. It has an active lab, which does contract research, but it has also received federal funding from NIH grants. Our objective is to discover new and innovative methods for healing wounds and detection devices of abnormal healing, which will help the clinician make better treatment decisions in wound management. The lab staff includes a material scientist and a molecular biologist as well as lab technicians.



**How do you obtain funding for research projects?**

The most common way for basic research in wound healing is through NIH grants. They have an attractive program to develop small businesses called SBIR [Small Business Innovation Research] and STTR [Small Business Technology Transfer] grants.



**What are some of the biggest obstacles that you encounter in the research setting?**

[The biggest obstacles are] political, as far as being able to have the freedom to do what you want to do in order to make a

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difference. This is also tied up with lack of funds to support research efforts.

There can also be a problem when business does not listen to good science. They are tied together.



**Can you tell us about the textbook that you edited,**

***Wound Healing: Biochemical and Clinical Aspects*. What was the catalyst behind becoming involved with this book?**

I felt that there was nothing out there that allowed you to see a huge panorama of wound healing and where there were challenges that needed solutions. This was before computers, and a textbook was needed in order to obtain information. My dream is to develop an online version of this book that is updated and that can continually evolve as new research is available.

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**Who would you consider to be your greatest mentor(s) in wound care?**

Earle E. Peacock Jr, Professor/Chairman of Plastic Surgery at the University of North Carolina at Chapel Hill, one of the wound-healing pioneers doing work inhibiting scar formation when I was a resident. He was an objective and dynamic teacher. When I came to him with my wound-healing thoughts he was very supportive.

George Martin, PhD, who was at the NIH and later worked for a wound-healing company, is also a mentor. George is the world's guru on connective tissue metabolism and contributed science to what we know today on wound healing. He was a teacher and a mentor.



**What contribution that you have made to wound healing are you the most satisfied with?**

The recognition I receive from people that I have trained is my greatest reward. There are people that I have mentored and trained all over the world who have been able to carry on and teach and influence others. I am glad I have been able to inspire people to go forward and instill a passion for wound healing.



**How did you get involved in starting the WHS?**

The WHS was started 20 years ago. I started to develop a wound-healing foundation in

order to manage funds that could be directed toward wound-healing research. We developed some documents to initiate the set-up of a wound-healing foundation, and from there we decided to set up the WHS. We got a business individual to assist us with the operations of the WHS and then we became formally established as a society.

Dr. Tom Hunt was the first president, and we rotated the president between an MD and PhD every other year. We started a journal (*Wound Repair and Regeneration*) and ran the whole WHS out of my Richmond office for the first five or six years. The WHS is still running over 20 years later, and the journal is known around the world. There are also nurses involved who have a scientific orientation. Two years ago, the WHS joined with the annual SAWC [Symposium on Advanced Wound Care] conference with great success.



**What areas of wound-healing research do you think we should be spending more time and money on? What does the future hold?**

The great light at the end of the tunnel will be tissue regeneration. If lower forms of life can do it then there is a possibility of this in humans. Before we get there, I think that the most exciting area is developing an artificial matrix that will replace tissue and be viable—like

blood vessels and skin, for example. That could make chronic wounds obsolete.

If you look at where science is now compared to where it was 50 years ago, you'll see that research is progressing at a logarithmic versus a snail's pace. Teams of experts in the wound-healing field need to work together in order to continue to progress wound healing.



**In what area has your most significant learning experience been in wound healing—clinical or research?**

The caring and compassion of nurses and physicians for the patient as a whole will always be a huge part of the wound-healing equation—no matter how far science goes. There is nothing greater than human touch, which must turn on factors in the brain that improve healing. We just aren't smart enough yet to understand all of these pathways triggered by emotions.



**Any words of wisdom from a wound-healing leader?**

Wound healing is understanding and being objective. Don't be complacent. Never stop questioning. Don't believe everything that you hear and always strive to understand the processes. Only through gaining an understanding of how things work will we be able to advance wound healing. ☞



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