


# INUS Neuro-Urology News

The Periodical of the International Neuro-Urology Society

Volume 3 • Issue 3 • June 2024 • neuro-uro.org

 @Neuro\_Urology

 @Neuro-Urology

 @INUS.org

 @Neuro-Urology

## Interview with the Expert

### Reflections on Neuro-Urology: Past, Present, and Future

#### Prof. Dr. Helmut Madersbacher

Associate Professor of Urology Emeritus  
INUS Immediate Past President

Interviewed by Dr. Glenn Werneburg, Editor NUN



For this Issue of Neuro-Urology News Interview with the Expert, I had the honor of interviewing INUS's Immediate Past-President, Prof. Dr. Helmut Madersbacher. He is well known to our Society, and to Urologists and medical practitioners around the world for his many contributions to research and clinical care, particularly as it relates to individuals with neurogenic lower urinary tract dysfunction. Prof. Madersbacher is the recipient of countless awards including the ICS Lifetime Achievement Award in 2019 and the Centennial Award from Rehabilitation International this year. He has published hundreds of scientific papers and book chapters, and is the Editor of the recently-released book entitled "Neuro-Urology: Theory and Practice". He is the Founder of the Neuro-Urology Unit at the University Hospital in Innsbruck. Below is our interview, edited for length and clarity.

#### Dr. Glenn Werneburg: What attracted you to Urology?

**Prof. Helmut Madersbacher:** I started my clinical work at the Innsbruck University Hospital in 1963, in the Department of Surgery. At that time Urology had become an independent Department and Prof. Hans Marberger, father of Prof. Michael Marberger, Vienna, was appointed as Head of Department and Professor of Urology. I heard from colleagues that he was trained in the USA, in

Iowa City, at the Department of Prof. Rubin H. Flocks. They told me that he brought with him innovations and new ideas: he implemented in Innsbruck the technique of transurethral resection of the prostate, which was not very well known at this time in Europe. But he had many fields of interest in urology: carcinoma of the prostate, endocrinology, urethral strictures, and he had a special interest in functional urology. These facts and the young team around him were so attractive to me that I applied for a resident position, which I obtained after finishing my term in surgery. I started Urology in 1965.

My first "research" work was the following. Prof. Marberger invited me to his home in the Oetzal valley, which was well known for a wonderful waterfall, a tourist attraction at that time. He asked me to prepare about 100 empty cans, which I had to color in red and to bring them with me. The next day, we climbed up the waterfall and the cans were thrown into the waterfall. The following observations were made: cans which got into the main-stream of the waterfall were swapped away by the raging water, down into the valley, cans which happened to get into the turbulent flow were transported and trapped into lagoons and stayed there for hours, days and sometimes weeks. "Natura non facit saltus" ("Nature does not make a jump").

## INUS Calendar

**INUS Lecture at the SIUD Congress 2024**  
Catania, Italy  
June 15-22, 2024

**INUS International Course on Neuro-Urology**  
Bangkok, Thailand  
June 27-28, 2024

**INUS Lectures at the Congress of the Pan Pacific Continence Society**  
Bali, Indonesia  
September 6, 2024

**INUS International Course on Neuro-Urology**  
Medellin, Colombia  
September 27-28, 2024

**INUS Lecture at the ICS Annual Congress 2024**  
Madrid, Spain  
October 23-25, 2024

**INUS Lecture at the Arab Association of Urology 2024**  
Doha, Qatar  
November 21-24, 2024

**INUS Course on "Gender Gap in Neuro-Urology"**  
Florence, Italy  
November 23, 2024

**INUS Annual Congress 2025**  
Zermatt, Switzerland  
January 16-18, 2025

### Interview with the Expert

Prof. Helmut Madersbacher  
Page 1-3

### Obituary: Prof. Katona

By: Prof. H. Maderbacher  
Page 4

### Literature Review

Dr. Javier Santiago  
Page 5

The model of the waterfall with the cans symbolizes what happens with bacteria in the urinary tract. When bacteria get caught in diverticula, sacculations or bulgings along the urinary tract, they cause recurrent urinary tract infections, which cannot be eradicated with antibiotics, but only with improving the flow conditions. This was recorded and the film was shown by Prof. Marberger at several conferences in the following years as most of the urologists at that time were not aware about the importance of hydrodynamics for urinary tract function/dysfunction. Unfortunately, this historic film got lost over the years, at least I couldn't find it in the scientific legacy of Prof. Marberger. In the following glass models with straight and bulging parts flowed with diluted ink replaced the waterfall and the cans, flow tests showed again that the ink particles remained in the bulging parts, but were washed out from the straight parts of the model as with the waterfall and its lagoons.

**GW: What about Neuro-Urology specifically?**

**HM:** At the end of my residency, Prof. Marberger asked me to take care of patients in the Department of Traumatology. This population included patients with spinal cord injuries, before they were transferred after many weeks or months to Tobelbad, Province of Styria, the only existing Rehabilitation Center in Austria, 700km away from Innsbruck. All these patients had indwelling catheters and most had recurrent febrile urinary tract infections. Many had urethritis, epididymitis, orchitis, urethral fistulae and strictures. Prof. Marberger was mainly interested in how to repair these urethral damages. However, I was interested to know more about why these catheters caused such damages especially in spinal cord injured patients. How could I improve the situation, by improving catheter care or by alternative techniques of bladder emptying during the spinal shock phase?

In the literature, I found the name of Sir

Ludwig Guttmann, Director of the Rehabilitation Center Stoke-Mandeville, near London, who had, against the will of the local urologists there, abandoned indwelling catheters in his spinal cord injury unit completely and introduced instead intermittent catheterization under sterile conditions with remarkable success. The infection rates had dropped dramatically. This increased my interest in this field, and I searched for scholarships to go abroad and to learn more. A first scholarship, provided by the British Council, enabled me to stay three months at the Institute of Urology in London, including visits to Stoke-Mandeville. Another scholarship gave me the opportunity to stay three months at the Karolinska Hospital at Stockholm, where I met Prof. Bodo van Garrelts, the father of uroflowmetry, and where I could study urodynamic techniques to evaluate lower urinary tract dysfunction.

In 1970, the Austrian Workers Compensation Board (AUVA) decided to build a second Rehabilitation Center with a spinal cord injury unit in the Western part of Austria, in Bad Häring, only 60 kilometers away from Innsbruck. By chance, I met the designated director of the center. He asked me whether I would accept an invitation to become a part-time Urology Consultant and I accepted. This fascinating offer stimulated me to go again abroad especially to the USA to further improve my knowledge in Neuro-Urology. With the help of a Rockefeller fellowship, I got the opportunity to stay 6 months in Houston, Texas at the Baylor Institute of Urology together with Brantley F. Scott. He was an outstanding personality, just when I arrived in Houston, he started to implant the artificial hydraulic sphincter and the inflatable penile prosthesis, both designed by him together with two colleagues. He also taught me an excellent technique for registration of the pelvic floor EMG during urodynamics with the help of wire electrodes. During these months in Houston, my "Neuro-Urology bible" was the book on Neurological Urology by E. Bors and A. E. Comarr, Long Beach, California,

published by S Karger in 1971. This is an excellent book from which we could still learn about the value of a correct history taking and targeted investigation including reflex testing as a basis for establishing a neuro-urological diagnosis without CT or MRI.

From this time onward, I decided to become a Neuro-Urologist, having the opportunity to take care of spinal cord-injured patients in Bad Häring, and other patients including newborns with myelomeningocele and urological problems in a small Neuro-Urology unit in Innsbruck. All this was thankfully supported by Prof. Marberger. Thanks to what I have learned in Houston, the first Scott's sphincter implantation in Europe was performed in Innsbruck in 1975.

**GW: Which of your investigations and discoveries, do you believe, has had the greatest impact?**

**HM:** After the flow experiments, my scientific interest focused on clinical problems in functional Urology/Neuro-Urology. One day, Brantley Scott did a sphincterotomy in a Mercedes star-like fashion (3 incisions) with significant bleeding during and after the intervention. He contemplated how to improve this technique and asked me to study the anatomy of the striated external male sphincter. And indeed, the sphincter muscle was thickest antero-medial and the muscle fades off, going lateral and down. Based on these findings, we described and published our experience with the anteromedian 12 o'clock sphincterotomy (H Madersbacher and B F Scott, Urol. Int. 30:75-76, 1975). This method became the standard technique of sphincterotomy in the following years, until the concept of transurethral sphincterotomy to abolish detrusor-sphincter-dyssynergia was replaced by intermittent catheterization and antimuscarinic medication.

The urological care of spinal cord-injured patients in Bad Häring comprised Uro-dynamics as well. Already at that time, I could perform pressure flow EMG Video-Uro-dynamics (PFEMGVU). Based on more than 100 video-urodynamic investigations, I could describe characteristic patterns of bladder neck, posterior urethra and pelvic floor area, according to the level of the spinal cord lesion and the type of bladder emptying, findings which I summarized under the heading “the neurogenic urethra”, which was also the topic of my habilitation brochure for being awarded the title of Associate Professor. The paper was published in the well known journal “Der Urologe” (“Die neurogen gestörte Harnröhre: Urethro-gramm und pathophysiologische Aspekte”, Urologe, 15, 1–12 (1976)). Because it was published in German language, PubMed did not include it in their library. One year before, in 1975, Gibbon et al. used the term neuropathic urethra for hypothesizing that functional obstruction in the posterior urethra could be due to urethral hypersensitivity due to defective sympathetic innervation. Therefore, there was no connection between my findings and their hypothesis.

Because the classification of lower urinary tract dysfunction at that time was very complex and sometimes hard to understand, I designed what was later called the “Madersbacher classification” of lower urinary tract dysfunctions, based on 8 frequent patterns of detrusor-sphincter-functions/dysfunctions, published already in 1990 in Paraplegia 28, 2017-2029. I was surprised that the Indian Congress of Functional Urology this year, invited me to discuss with them the advantages and disadvantages of this classification, which I published more than 30 years ago. Last but not least, I’m very proud that

together with my friend Limin Liao, we published the first Handbook of Neuro-Urology, comprising 961 pages, 84 chapters from 98 authors, most of them being INUS members.

**GW: As founder of the field, how has Neuro-Urology evolved over the course of your career?**

**HM:** Neuro-Urology started with the urological care of spinal cord-injured patients, children with myelomeningocele and later on with multiple sclerosis patients. Spinal-cord injured patients and myelomeningocele patients are still a core cohort, however modern Neuro-Urology in an aging population means a sharp increase of dysfunction of the lower urinary tract, caused by degenerative brain processes and diseases of the central and peripheral nervous system. The need for neuro-urological care for the population is constantly increasing. However, despite this fact, Neuro-Urology is still a stepchild of Urology, shadowed by other subspecialties including Onco-Urology and robotic-assisted surgery.

**GW: What has been the most gratifying aspect of your career?**

**HM:** Stimulated by Dr. Emanuel Braschi (Argentina) and with the help of well-known Neuro-Urologists from all parts of the world, I could proudly announce the foundation of the International Neuro-Urology Society (INUS) in 2015. The aims of this society were and is still are to increase the visibility of Neuro-Urology in order to provide the best possible care for neuro-urological patient worldwide.

**GW: How do you envision the future of**

**Neuro-Urology?**

**HM:** Neuro-Urology is a fast-developing subspecialty of Urology. However, only in Switzerland so far, Neuro-Urology is officially regarded as a subspecialty of Urology. There are only two chair holders of Neuro-Urology in Europe, one is Prof. Thomas Kessler at the Zurich Medical University and the second one is, more recently, Prof. Bertil Blok, chair holder of Neuro-Urology at the Erasmus University in Rotterdam. There is an urgent need to promote Neuro-Urology on the academic level, to get more Neuro-Urologists in leading positions which is a prerequisite for further development.

**GW: What advice do you have for young INUS members who aspire to be clinician-investigators (physician-scientists) with a neuro-urology focus?**

**HM:** In order to be able to offer the population, especially the elderly, adequate neuro-urological care, we need motivated young clinicians, but also motivated young researchers, since many questions regarding neural control of lower urinary tract function and its alterations through the course of a neuro-urological disorder remain unclear. The prerequisite to becoming a good neuro-urologist is a good education in general urology. If the aims for further development are on the scientific side, some time should be spent in a relevant laboratory, if one aims to work in a specialized Neuro-Urology Center and to perform surgery, adequate training in bowel surgery and some experience with neurosurgery is recommended. For both directions, I strongly recommend taking advantage of scholarship offers, to go abroad and learn how other colleagues do their work.



**INUS**  
**ANNUAL**  
**CONGRESS**  
**2025**



**ZERMATT**  
Switzerland  
January  
16-18



# Obituary

## Prof. Ferenc Katona (1925-2023)

A Tribute to a Legendary Physician, Scientist and Humanist  
 Obituary by: Dr. Helmut Madersbacher  
 INUS Immediate-Past President



Dear INUS members,

Sadly I have to inform you that Professor Ferenc Katona, to the Neuro-Urologist known as the father of intravesical electric stimulation therapy, has passed away recently. The following article commemorates this great personality.

### A Tribute to a Legendary Physician, Scientist and Humanist

Who was he really, Prof. Katona?

Prof. Katona was born on September 23, 1925 in Budapest. He graduated from the Medical University of Budapest in 1953. In 1963-1965, he continued his studies at the Mount Sinai Medical Center in New York and 1966 at the University of Medicine in Lund, Sweden. From 1953 onward, he was a neurosurgeon at the National Institute of Neurosurgery of Hungary. In 1975, he founded the Department of Neurology and Neuro-Habilitation at the Szabadsághegy (Svábhegy) Children's Hospital on behalf of the Ministry of Health, which has been operating as a Department of St. Margaret's Hospital in Budapest since 2007. In 1963, he became a candidate for medical sciences (PhD) in 1989, doctor of medical sciences (DSc). Since 1989, he has been an honorary professor at the Semmelweis University, Budapest.

In the following years, he continued his research in Italy, the USA (Mount Sinai Hospital, New York), Sweden, and England on the comparative physiology and pharmacology of the vegetative nervous system and on the paralysis of the vegetative visceral organs. A great merit of his was the development of a new concept and a test program for the early diagnosis of cognitive defects leading to intellectual disability. With all this, he achieved unique results worldwide in reducing the consequences of perinatal brain damage and developing prevention.

In the world of Urology, specifically Neu-

ro-Urology, Prof. Katona is known as the father of transurethral intravesical electrotherapy for neurogenic bladder dysfunction: Already at the beginning of his career, he developed and published (Urol. Int. 30(3), 1975, 192-203) his method for the treatment of neurogenic lower urinary tract dysfunction, which is still accepted worldwide. The method described was initially very controversial, probably because some colleagues did not understand the working mechanism of intravesical electrotherapy. They thought it was direct bladder wall muscle stimulation, a method for which there are definite contraindications that must be considered.

Results of intravesical electrostimulation, using modifications (e.g. electrical stimulation parameters) are still being published worldwide. Only recently, in 2017 Deng et al. published a paper entitled "Clinical efficacy of intravesical electrical stimulation on detrusor underactivity. 8 years of experience from a single center" in Medicine (Baltimore). Prof. Katona was one of the first scientists, much earlier than others, who recognized that the driving force for the micturition reflex is the afferent side and also his method the intravesical electrostimulation is based on "afferentation" of the micturition reflex by stimulating the mechanical receptors in the bladder wall.

Due to his experience in this field, he was invited to many countries. In Mexico, he received the title of Doctor Honoris Causa Universidad Autonoma Metropolitana Mexico. His work was recognized with numerous national and international awards. For example, he received the first prize in 1964 from the American Society of Anesthesiology in New York, and first prize for the best presentation at the International Continence Society (ICS) Congress in 1984 in Innsbruck. His scientific work comprises sixteen professional books and monographs in Hungarian and foreign languages, 257 peer-reviewed papers, and more than 500 lectures at national and international con-

gresses.

I personally heard of Prof. Katona when I was in Australia, visiting the Prince Henry Hospital in Sydney 1981, where Prof. Katona had lectured just before I arrived. Robert Farnsworth who was Associate Professor of Urology there, was surprised I didn't know Prof. Katona, "who is working in Budapest, only about 200 km away from Vienna." However, at this time the Iron Curtain divided the Western and the Eastern world, and was also a barrier between Hungary and Austria. Nonetheless, after coming home from Australia, I immediately contacted Prof. Katona in Budapest and visited him together with our team. We were excited about his work and implemented his methods in our Neuro-Urology unit, in which neonates with myelomeningocele were also treated for neurogenic bladder dysfunction.

Several mutual visits followed after which Ferenc and I became close lifelong friends. Whatever one talked about, wherever the conversation turned – to the Dolomite mountains, the Italian Renaissance, recent and distant events, history, architecture, the animal world, painting, literature, religious history, anything, Ferenc always provided a new perspective.

I was always amazed by his tolerance, positive outlook on life, and optimism. He was really a great humanist. His energy was admirable and perhaps even more so was his ability to energize, motivate, and encourage others.

I will keep Prof. Ferenc Katona as a remarkable and empathetic physician, a brilliant scientist, a great humanist, and a wonderful friend, always in my mind.

-Prof. Dr. Helmut Maderbacher

## Literature Review



### Dr. Javier Santiago (US)

Fellow, Genitourinary and Reconstructive Surgery  
Department of Urology  
Cleveland Clinic, Cleveland, OH  
Foreword by Dr. Glenn Werneburg, NUN Editor

Dr. Javier Santiago discusses two recent articles in the neuro-urological literature. Dr. Santiago is completing his Genitourinary and Reconstructive Urology Fellowship at the Cleveland Clinic, and will soon go on to be a Staff Urologist at the University of Wisconsin. The focus of his clinical and surgical practice, and academic pursuits, is Neuro-Urology. In his commentary, he discusses the important topics of quality of life in patients with neurogenic lower urinary tract dysfunction, and the evidence and evidence gaps related to the clinical use and environmental impact of the single use urinary catheter. I welcome Dr. Santiago as an INUS Member, and look forward to more of his contributions to the Society and the Neuro-Urology field in the future.

**Dr. Javier Santiago:** Providing effective care to patients with neurogenic lower urinary tract dysfunction necessitates an un-

derstanding of the patient experience. If we strive to help patients maximally approach an ideal quality of life, multiple variables beyond anatomy and bladder physiology factor enter consideration. The interplay of different organ systems, psychological stress, logistical and financial burden, and social support may all become relevant when designing treatment plans. To that end, reflecting on patient priorities and the impact of common interventions is a fruitful exercise to improve care.

**Loftus CJ, Ratanawong JP, Myers JB, Lenherr SM, Stoffel JT, Welk B, Grove S, Elliot SP. Bladder management is the top health concern among adults with spinal cord injury. *Neurourology and Urodynamics* 2023;43(2):449-458.**

Spinal cord injury (SCI) patients face a multitude of challenges post injury, and urinary

complications are a well-known source of bother. The responsible patient-specific factors for such bother are less well understood. The Neurogenic Bladder Research Group (NBRG) assessed a large population of 1,461 SCI patients through phone interviews and surveys to identify the highest concerns of patients and the relevant variables impacting the ranking of these concerns. Half of the patients were performing intermittent catheterization (CIC), while 18%, 18%, and 13% had indwelling suprapubic tube or urethral catheter, were spontaneously voiding, or had prior urinary reconstruction, respectively. Notable survey measures were the Neurogenic Bladder Symptom Score (NBSS) and Neurogenic Bowel Score (NBS). The top 3 problems for each patient were selected from a list of common problems identified by SCI focus groups and then ranked in order of concern.

**10 YEARS**

**INUS**

**SAVE THE DATE**  
**JANUARY 16 - 18, 2025**

**INUS**  
ANNUAL CONGRESS  
2025

**ZERMATT**  
Switzerland  
January  
16-18

Bladder management (39% primary concern, 20% secondary), pain (16% primary), and bowel management (12% primary, 29% secondary) topped the list of problems. Time since injury and worse NBSS scoring had small but significant effects on choosing bladder management as primary concern. Within the NBSS domains, incontinence and storage domains held statistical significance. Mean NBSS for the total group was 24.3 (scored from 0-74 with higher scores indicating worse or more severe symptoms). These findings reassert the importance of bladder management to patients; though, surprisingly the type of bladder management and incidence of urinary tract infections (UTI) did not influence the ranking of this decision. The authors note that in prior work, bladder reconstruction was associated with increased urinary quality of life and satisfaction compared to catheter based management. Further, the NBSS is evidently a valuable tool in studying the effects of specific urinary symptoms unique to the patient with neurogenic bladder. The reporting of chronic daily pain was strongly associated with choosing pain as primary concern. Pain and spasticity are common, and collaboration with other specialties is essential for appropriate management. Interestingly, choosing bowel management as the primary concern was not influenced by colostomy status, but was associated with higher NBD score as well as prior bladder surgery (OR 3.13). The authors note that bladder reconstruction has previously been associated with worse bowel symptoms, however the causal relationship is unclear. Conceivably, bowel symptoms could rise in salience as bladder symptoms improve after reconstructive surgery. However, also worth consideration is the possible impact on stool transit time, consistency (e.g. loos-

er stools), and fecal incontinence. When using bowel for bladder reconstruction (e.g. ileal or cecal harvest), preoperative counseling and attention to post-operative bowel habits and management is prudent to avoid unexpected deterioration in quality of life.

**Zhao CC, Comiter CV, Elliott CS. Single-use catheters: evidence and environmental impact. BJU International 2024.**

In the modern era, both patients and physicians take the predominance of single use catheters in intermittent catheterization for granted. Despite knowledge of Dr. Lapidès' observations and the inception of chronic intermittent catheterization (CIC), my generation of Urologists sees few patients regularly reusing catheters. In this review of the literature comparing reusable vs single use catheterization, the authors pointedly pose the question of whether the transition to single use catheters over the past two decades is scientifically, economically, and environmentally justified. They highlight notable policy shifts such as the 2008 change in Medicare coverage to promote single-use catheter adoption by expanding coverage from 4 reusable catheters per month to 200 single-use catheters per month. This was instituted for the purpose of decreasing UTI risk, and consequently UTI risk is a focus of the review. Arguments in favor of decreased UTI risk with single-use catheters include increased sterility and decreased friction and consequent trauma with hydrophilic coating. In reviewed studies, a common issue is the heterogeneity in defining UTI. Variable definitions including subjective criteria such as odor and appearance were present which limits interpretation of the analyses. Eleven comparative studies were ultimately identified,

including 9 randomized controlled trials (3 cross-over), 1 cross-sectional study, and 1 retrospective study. The authors note that a Cochrane review on the subject found only 2 of the randomized controlled trials appropriate for analysis and that, ultimately, an advantage of single-use catheters could not be demonstrated. The authors then provide a descriptive summary of the 11 identified studies, 9 of which involved a neurogenic bladder population. In this review, only 3 studies identified a statistically significant difference in UTI incidence, with 2 of these favoring reusable catheter use. The 1 study favoring single-use catheters was a global cross-sectional study and potentially confounded by socio-economic factors. Otherwise, no evident difference in UTI incidence was present. Patient comfort and ease of use in certain social situations is also a consideration. For example, patients may find the single-use catheter delivery system particularly helpful when out in public. However, in the available studies no advantage was observed for ease or comfort with single-use catheters. With this foundation of literature, the authors then introduce the financial and environmental impact. Notable figures include an estimated \$1.8 billion annual expenditure on catheters in the United States, and the estimate of 1.5 million catheters used per day just in the neurogenic population - enough catheters to "...encircle the globe 5.5 times..." or "...fill 80 olympic sized swimming pools." This data give cause to challenge our assumptions on what is best for patients when it comes to catheterization technique and to consider the impact on our planet. Lastly, the authors highlight the ongoing multicenter COM-PaRE trial which is designed to account for the limitations present in prior studies in this space.

 **INUS**  
**ANNUAL**  
**CONGRESS**  
**2025**



**ZERMATT**  
Switzerland  
January  
16-18 