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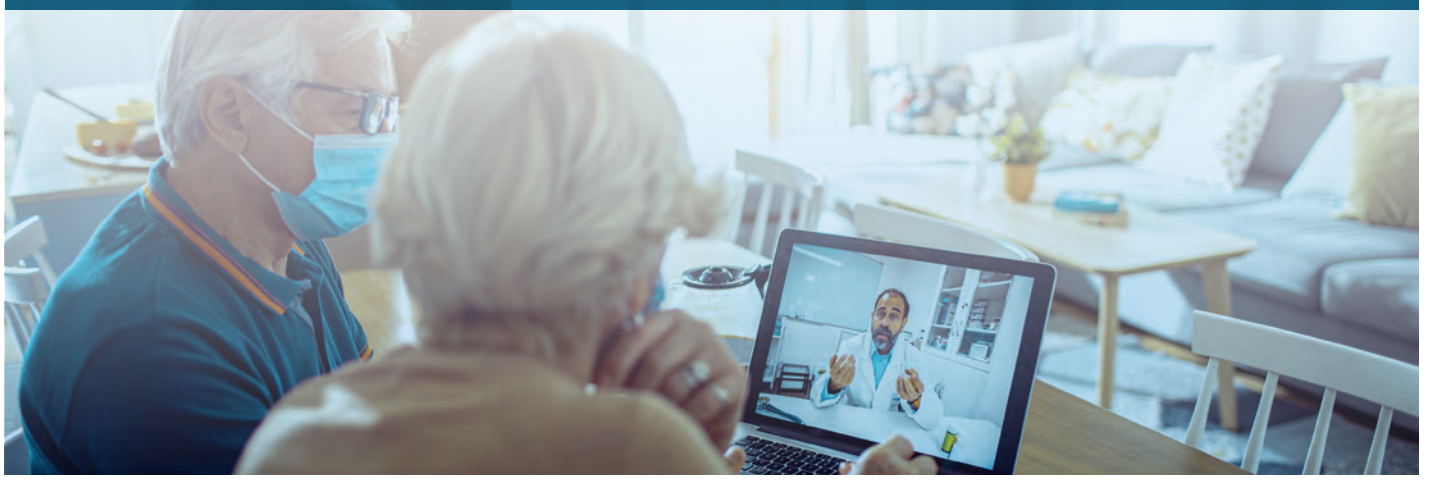
Juan J. Andino, MD, MBA



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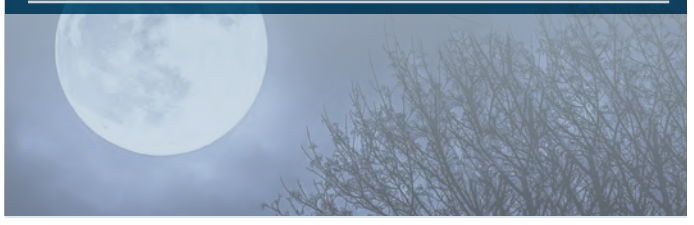

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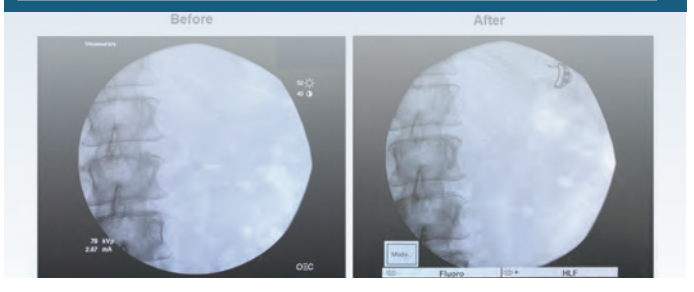

My Experience as a 2024 AUA/JUA Exchange Program Scholar: An Unforgettable Academic and Cultural Immersion

Nirmish Singla, MD, MSCS, FACS

INSIDE THIS ISSUE

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AUA ADVOCACY

The Future of Telehealth Depends on How Congress Will Act

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AUA Telehealth Task Force
AUA Western Section Health Policy Committee

Why was telehealth one of the AUA Advocacy Summit priorities for the third year in a row? Why does the AUA census include questions about telehealth use? Almost everyone had to use telehealth during the COVID-19 public health emergency. We had to. People were afraid. Clinics were shut down. Social distancing was a necessity, and it was enforced.

Telehealth was the only way to ensure patients had some way to connect with their doctors, surgeons, and other providers. Initially, emergency declarations led to broad flexibility in how telehealth could be used. FaceTime (and other modalities that are not US Health Insurance Portability and Accountability [HIPAA] compliant), care delivery across state lines, and even reimbursing equally for audio-only (phone call) visits were temporarily allowed across the states. As federal and state emergency declarations began to fade, many of these changes were rolled back.

However, certain key flexibilities remain in place until December 31, 2024, thanks to the Consolidated Appropriations Act of 2023.[1] Language included in this appropriation bill was supported by AUA members and leadership during the 2022 Advocacy Summit as part of a coalition including the American Medical Association, Alliance of Specialty Medicine, Alliance for Connected Care, and the American College of Surgeons, among many others. At the federal level, key regulatory flexibilities remain in place (Figure):

- Waiving of originating site requirement (patient can engage in telehealth from home; rurality/health care provider shortage not required)
- Payment parity for telehealth and in-person visits by medical decision-making
- Virtual supervision included in direct supervision (residents, advanced practice providers)

> "Importantly, data support the continued use of telehealth. Even before the pandemic, numerous studies in urology demonstrated high satisfaction and equivalent clinical and safety outcomes.[2,3]"

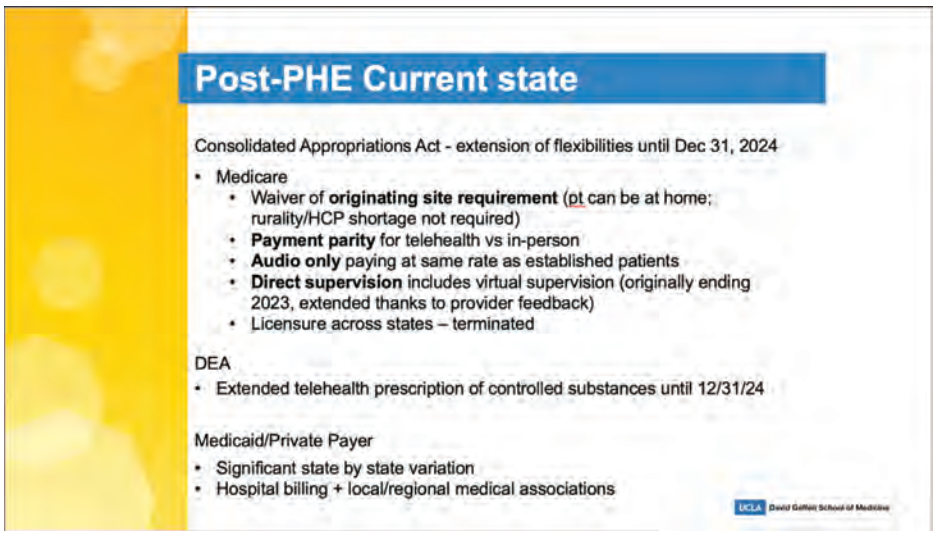

Figure. Post–public health emergency (PHE) current state. DEA indicates Drug Enforcement Administration; HCP, health care provider; pt, patient.

Importantly, data support the continued use of telehealth. Even before the pandemic, numerous studies in urology demonstrated high satisfaction and equivalent clinical and safety outcomes.[2,3] Even more recently, a narrative review of telehealth looking at data beyond urology highlighted improved patient-centered outcomes such as cost and time savings, health-system outcomes supporting virtual care used as a substitute for in-person visits, and similar clinical outcomes compared to clinic encounters.[4] Telehealth should be an option for patients to connect with their urologists; it is not a novel intervention, simply a different way for patients to access specialty care.

Beyond continuing the current public health emergency telehealth flexibilities, there is also ongoing work to prevent the creation of a digital divide—that is, unequal access to telehealth services due to preferential reimbursement for video visits, which require broadband internet and smart devices.[5] For patients who cannot connect with video, phone encounters with evaluation and management of medical conditions should be covered and reimbursed similarly. Otherwise, health systems will be disincentivized to offer anything but in-person or video visits, and the promise of improved access to care will not be realized for rural and marginalized communities.

> "Telehealth should be an option for patients to connect with their urologists; it is not a novel intervention, simply a different way for patients to access specialty care."

> "As of this writing, 34 federal bills support the expansion of telehealth services, including the AUA-endorsed Connect for Health Act, with bipartisan support from 59 senators."

As of this writing, 34 federal bills support the expansion of telehealth services, including the AUA-endorsed Connect for Health Act, with bipartisan support from 59 senators. If this affects your patients, your loved ones, or your practice, then I encourage you to get involved. Join the AUA Advocacy efforts. Go to the Advocacy Summit, donate to the AUA Political Action Committee, contact your representatives by using our Action Center, join your section health policy committee, and help make the voice of urology heard so we can continue to shape the future of modern medicine. ■

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AUA2024 RECAPS

Future Investigations to Consider Nocturia a Circadian Rhythm Disorder of the Bladder

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Nocturia is defined by the International Continence Society as "the number of times urine is passed during the main sleep period. Having woken to pass urine for the first time, each urination must be followed by sleep or the intention to sleep."[1] Two or more nocturnal voids are considered to be an important clinical threshold associated with significant negative outcomes for well-being and health in individuals.[2] Nocturia affects up to 18% of women under the age of 40 years old and up to 61.5% of women above the age of 70 years old.[3] Nocturia can be categorized as (1) nocturnal polyuria, (2) diminished global or low nocturnal bladder capacity, or (3) polyuria.[4] Nocturia is often multifactorial with underlying causative factors, including intake, urological/gynecological, nephrological, hormonal, sleep, and cardiovascular concerns (Table).[5] Frequent nighttime urination can have a profound impact on the overall quality of life in many patients, with reports of sleeplessness, decreased slow-wave sleep, and daytime somnolence.[3] Individuals with nocturia who wake up 3 or more times at night have a significantly higher rate of mortality than the general public.[3,6] Nocturia not only impacts one's ability to rest, but it also impacts day-to-day activities such as work, household chores, exercise, and intimacy.[7] Despite its prevalence, only 1.5 million individuals out of the 50 million individuals affected by nocturia receive treatment.[6] The pathophysiology of nocturia is often complex, which makes it difficult to treat patients with current therapies.[7]

> "Frequent nighttime urination can have a profound impact on the overall quality of life in many patients, with reports of sleeplessness, decreased slow-wave sleep, and daytime somnolence.[3]"

Light is the primary zeitgeber for the circadian rhythm system as it acts through the retina to regulate the suprachiasmatic nucleus or the master circadian oscillator.[8] The circadian rhythm modulates many visceral organs, including the bladder, through peripheral clocks.[9] This is ultimately facilitated by the detection of light changes throughout the day via photoreceptors in the retina. In response, there is an increase or decrease in the expression of certain genes, such as *CLOCK* and *Bmal1*. Typically, during the awake phase, there is increased arousal, increased urine output, and decreased functional bladder capacity.[9,10] The opposite is seen during the nocturnal sleeping phase. There is an intricate balance that determines functional capacity and the bladder's ability to store urine. Capacity may be determined by the 24-hour circadian cycle, and it is postulated that capacity is regulated at the ion channel level by *CLOCK*-related genetic machinery.[10] Further research needs to be conducted on patients experiencing nocturia to understand how *CLOCK* gene transcription regulates urothelial signaling in the bladder. In the long term, we hope that the molecular information will guide the creation of novel therapeutic agents to improve the symptoms and, even more importantly, the quality of life of the millions of patients suffering from nocturia.

> "Light is the primary zeitgeber for the circadian rhythm system as it acts through the retina to regulate the suprachiasmatic nucleus or the master circadian oscillator.[8] The circadian rhythm modulates many visceral organs, including the bladder, through peripheral clocks.[9]"

The extensive impact that nocturia has on the lives of patients has prompted it to be studied in animal models. Early studies assessing micturition and the circadian rhythm in the bladder used rodents as animal models.[10] Rodents are nocturnal animals in that their sleep-wake cycle is opposite of humans. Initial studies have shown that the bladder capacity of rats is elevated during the lights-on sleep phase cycle and decreased during the lights-off wake phase cycle. Oscillations in the circadian clock influence the transcription of certain genes, including *Per, Cry*, and *Bmal1*.[10]

Additional studies have been conducted using mouse models. Ihara et al evaluated restraint stress on mice to investigate the circadian bladder function and rhythmicity of gene expression.[9,11] Investigators found that intermittent stress results in a loss of *Per2* rhythm. Ultimately, restraining resulted in the loss of animals' innate rhythm of void volume and frequency.[9,11] Control mice showed typical circadian expression of bladder genes *Per2, Bmal1*, and *Rev-erbα*. Similarly, when assessing the knockout of mammalian cryptochrome proteins, *Cry1* and *Cry2*, in mice, it was found that those with a genetic knockout of

Table. Summary of Nocturia Causative Factors, Underlying Pathophysiology, and Lifestyle Interventions

Causative factors	Underlying pathophysiology	Lifestyle interventions
Intake	Water, proteins, sodium, obesity	Limit drinking, calories, salt, protein restriction
Urological/ gynecological	Overactive bladder, bladder outlet obstruction, neurogenic bladder	Bladder and pelvic floor training, weight loss
Nephrological	Water diuresis, salt diuresis, hypercalciuria, nephrogenic diabetes insipidus	Salt and protein restriction, weight loss, prevention of diabetes and obesity
Hormonal	Sex hormones, diabetes insipidus, diabetes mellitus	Sleep hygiene, limit drinking, bladder and pelvic floor training, weight loss in diabetes mellitus
Sleep	Obstructive sleep apnea, sleep disruption and shortage, low dopamine diseases	Sleep hygiene, losing weight, physical activity
Cardiovascular	Blood pressure, metabolic syndrome, physical activity	Physical activity, salt restriction, weight loss, postural drainage, stockings

Data from Everaert et al.[5]

→ Continued on page 5

FUTURE INVESTIGATIONS TO CONSIDER NOCTURIA

→ Continued from page 4

> "In the long term, we hope that the molecular information will guide the creation of novel therapeutic agents to improve the symptoms and, even more importantly, the quality of life of the millions of patients suffering from nocturia."

both proteins resulted in free-running circadian rhythms.[9] The study ultimately demonstrated that both proteins are essential for maintaining intrinsic circadian rhythm.

Bladder circadian rhythm genes in rodents can be altered based on induced stress. The bladders of rodents, including mice and rats, are sufficiently similar to the human urinary tract to warrant investigation. In humans, despite specific lifestyle interventions directed at the underlying pathophysiology of each of the 6 main causative factors resulting in nocturia (Table),[5] nocturia may be refractory, leading us to pursue further investigations into the study of nocturia as a circadian bladder dysfunction.

We hope to fill this knowledge gap by determining the impact of sleep interruption on circadian bladder gene expression. Using such an approach, it should be possible to extrapolate information from animal models to the human urinary tract and better understand the pathophysiology of gene regulation for patients with nocturia. ■

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Underneath the White Coat: Hypogonadism Among Male Resident Physicians

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Hypogonadism is a significant medical condition that has been gaining increased attention in recent years. The prevalence of hypogonadism varies, with estimates ranging from 2.1% to 30% in men ages 40 to 79, depending on the definition and population studied.[1] The severity of hypogonadism can range from mild to severe, with symptoms including reduced libido, erectile dysfunction, decreased energy, depression, and anemia, among others.[2] The economic burden of hypogonadism is substantial, with one study estimating the 20-year cost of testosterone deficiency in US men ages 45 to 74 at $190 billion to $525 billion.[3] The importance of addressing hypogonadism is underscored by its potential long-term health impacts, including increased risk of cardiovascular disease and osteoporosis.[4] Understanding and addressing hypogonadism are crucial for improving patient quality of life and reducing health care costs.

Despite the growing recognition of hypogonadism as a significant health issue, its prevalence and impact on resident physicians remain largely unexplored. In contrast to the aging male population, little information exists regarding the epidemiology of hypogonadism in young adult males. However, one estimate indicates that testosterone deficiency may be present in up to 20% of adolescent and young adult males ages 15 to 39.[5] Clinical diagnosis in young adults may be more challenging than in males over 45, as they may present with nonspecific symptoms, such as fatigue, rather than sexual dysfunction more commonly seen in older men. Recent evidence also shows that the cutoff of 300 ng/dL used to determine testosterone deficiency in adult men at any age may be inappropriately low to accurately diagnose hypogonadism in young adults, with a cutoff of 400 ng/dL likely being more appropriate for men ages 20 to 44.[6]

Resident physicians, the majority of whom are under the age of 45, are a group known to experience high levels of stress, irregular sleep patterns, and long working hours. These factors have been associated with hypogonadism in other populations. Nonstandard shift work and insufficient sleep have also been positively associated with urologic complications in males.[7,8] Furthermore, the symptoms of hypogonadism, such as fatigue, depression, and decreased libido, overlap significantly with symptoms of burnout and depression, conditions known to be prevalent among resident physicians.[9] This overlap may lead to misdiagnosis or underdiagnosis of hypogonadism in this population, potentially exacerbating the health and wellness challenges they face. Therefore, our objective was to evaluate the prevalence and impact of hypogonadism among male resident physicians at our institution.

We conducted a prospective study involving male physicians in medical training at our institution. The data for the study were obtained through a combination of survey questionnaires and laboratory tests. The survey data were collected using the Research Electronic Data Capture (RedCAP) system. After obtaining approval by the Institutional Review Board, potential participants were identified through study protocol distribution to Accreditation Council for Graduate Medical Education resident and fellow program physicians at our institution. The participants were not restricted by age, specialty, or postgraduation year (PGY). Of the 651 eligible male residents and fellows, 27 residents expressed interest in participation. The exposure variables of interest in this study were the working conditions of the resident physicians, assessed through the participants' specialty and PGY level, as well as overnight call schedule and night shift work within the preceding months.

The primary outcome of interest was the prevalence of hypogonadism among the participants, as measured by testosterone levels in the blood. Participants were asked to complete lab work, including a basic metabolic panel, complete blood count, lipid panel, thyroid panel, and measurements of testosterone, follicle-stimulating hormone, luteinizing hormone, and estradiol. Secondary outcomes included the severity of hypogonadism symptoms, as measured by the Androgen Deficiency in the Aging Male (ADAM) questionnaire, and overall health status, as measured by the 36-Item Short Form Health Survey. The ADAM questionnaire is a sensitive screening tool for hypogonadism in males ages 40 and above.[10] Although this sensitivity has not been demonstrated to the same extent in young adults, we felt the ADAM questionnaire was a reasonable tool for detecting hypogonadism symptoms in our participants. The prevalence of hypogonadism was calculated as the proportion of participants with total testosterone levels below 400 ng/dL.

The characteristics of the study subjects are presented in Table 1. Out of the 651 male residents and fellows contacted, 27 expressed interest in participation, yielding a response rate of 4.1%. Of these, 88.9% (24/27) provided demographic data and 66.7% (18/27) completed the surveys. Among those who filled out the survey, 33.3% (6/18) completed the lab work. The participants were diverse in terms of age, specialty, and PGY. These values are reported independently in Table 1 to maintain anonymity. The results of the laboratory tests are presented in Table 2. Two-thirds (4/6) of the participants who completed the lab work had total testosterone levels below 400 ng/dL. Two participants met the serum criteria (<300 ng/dL) for hypogonadism. The results of the ADAM questionnaire and 36-Item Short Form Health Survey are presented in Table 3. Half (9/18) of the participants scored positively on the ADAM questionnaire, indicating the presence of hypogonadal symptoms. Furthermore, 44.4% (8/18) of the participants reported that their health was worse compared to a year prior. Among the participants who reported not taking any overnight calls, 20% (1/5) scored positively on the ADAM questionnaire. For those who reported regularly taking overnight calls (ie, every third day, every fourth day, etc) or working night float in the past 6 months, 61.5% (8/13) scored positively.

The key finding of this study is the presence of hypogonadal symptoms in male resident physicians at our institution. Two-thirds of the participants who completed the lab work had total testosterone levels below 400 ng/dL, and half of the participants scored positively

Table 1. Participant Characteristics (n = 24)

	No.	%
Specialty		
Critical care	3	12.5
Dermatology	4	16.7
Radiology	1	4.2
Orthopedics	1	4.2
Neurology	1	4.2
Anesthesia	9	37.5
Emergency	1	4.2
Surgery	2	8.3
Urology	1	4.2
Oral surgery	1	4.2
PGY		
1	5	20.8
2	3	12.5
3	5	20.8
4	5	20.8
5	2	8.3
6	3	12.5
9	1	4.2

Abbreviations: PGY, postgraduate year.

→ Continued on page 7

UNDERNEATH THE WHITE COAT: HYPOGONADISM AMONG MALE RESIDENT PHYSICIANS

→ Continued from page 6

Table 2. Results of Serum Testosterone Testing

Subject	Serum testosterone (ng/dL)	Positive ADAM? (Y/N)
1	398	N
2	612	Y
3	298	Y
4	305	Y
5	339	N
6	849	N

Abbreviations: ADAM, Androgen Deficiency in the Aging Male questionnaire.

on the ADAM questionnaire. Additionally, residents who reported taking overnight calls or night floats were more likely to score positively. This cohort is too small to provide an accurate estimate of the prevalence of hypogonadism in the male resident population, although our findings suggest that the lifestyle and working conditions of residents may contribute to hypogonadal symptoms or the development of hypogonadism. Our findings also highlight the potential overlap between hypogonadism and other health issues common among resident physicians, such as burnout and depression.

These findings are consistent with previous research showing a link between stressful working conditions and hypogonadism. However, they extend the existing literature by demonstrating this link in a population of resident physicians, a group that has not been extensively studied in this context. This pilot's data demonstrate a need for further investigation to properly assess the prevalence of hypogonadism in male residents. A repeat of this study in a larger cohort, while controlling for potential confounding factors such as age, lifestyle factors, and comorbidities, can give stronger insight into the effects of residency on young adult males. Despite its limitations, the findings of our study have important implications for the health and wellness of resident physicians, suggesting that male residents may benefit from early screening and education on recognizing symptoms of hypogonadism. ■

Table 3. Androgen Deficiency in the Aging Male Questionnaire Positivity Rates and 36-Item Short Form Health Survey[a]

	Hypogonadal, % (n = 2)	Eugonadal, % (n = 4)	All participants, % (n = 18)
Positive ADAM	100	25	50
SF-36[b]			
Physical functioning	82.5	95.0	94.4
Role limitations due to physical health	62.5	75.0	73.6
Role limitations due to emotional problems	33.3	75.0	59.3
Energy/fatigue	32.5	51.3	43.1
Emotional well-being	60.0	66.0	64.7
Social functioning	62.5	68.8	70.1
Pain	68.8	87.5	81.0
General health	35.0	61.3	59.4
Health change	37.5	43.8	42.6

Abbreviations: ADAM, Androgen Deficiency in the Aging Male questionnaire; SF-36, 36-Item Short Form Health Survey.
[a]Questionnaire averages for all study participants and those who obtained lab work with hypogonadal vs eugonadal results.
[b]For the SF-36, 100% represents the highest level of function.

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Ethics Review: This study was conducted in accordance with the ethical standards of the Institutional Review Board at our institution. All participants provided informed consent prior to their inclusion in the study.

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Lithotripsy for Small, Nonobstructing Renal Calculi

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Approach to Small, Nonobstructing Renal Calculi

Small renal calculi are often asymptomatic and incidentally detected on imaging modalities during the workup of other medical conditions. While the treatment approach is clearer for symptomatic and larger renal calculi, managing smaller and lower-burden stones depends on patient history, imaging, and laboratory studies. Although most nonobstructing small renal stones are asymptomatic, they may still progress to become symptomatic either due to infection or obstruction in up to one-third of cases.[1] While small nonobstructing stones have commonly been actively surveilled, recent literature shows that their removal results in a lower incidence of future complications of up to 82% compared to stones that are not removed.[2] Therefore, patients with small renal stones should be aware of all management options when presenting to the clinic.

Common Treatment Options

For patients who seek treatment for their small, nonobstructive renal stones, the 2 contemporary treatment options are ureteroscopy (URS) and extracorporeal shock wave lithotripsy (ESWL). While studies have shown that URS may be more effective than ESWL as an initial approach to achieving a stone-free outcome, URS commonly includes ureteral stent placement. Stents have several well-known complications, including increased rates of hematuria, irritative urinary

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LITHOTRIPSY FOR SMALL, NONOBSTRUCTING RENAL CALCULI

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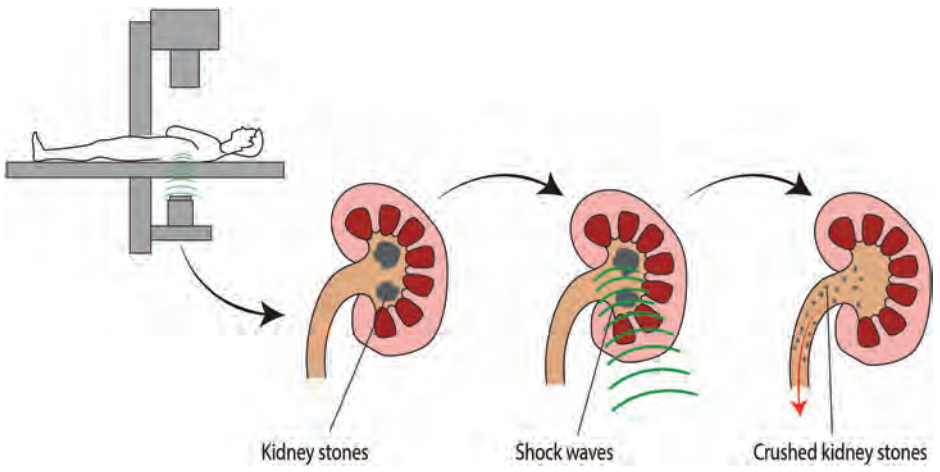

Figure 1. Mechanism of extracorporeal shock wave lithotripsy. A lithotripter machine generates shock waves that create ultrasonic vibrations that fragment the kidney stones.

symptoms, infection, and dysuria. In contrast, studies have shown that stents have no benefit and are therefore not needed for patients undergoing ESWL, especially if the stone is small (<15 mm).[3]

Lastly, URS involves general or spinal anesthesia, unlike ESWL, which can be done with intravenous sedation or even local anesthesia.[4] Thus, while both are reasonable treatment options for small, nonobstructive stone removal, ESWL may be a better option for patients who prefer a less invasive outpatient procedure without stent placement (Figure 1).

Outcomes of ESWL

ESWL can break up stones anywhere in the urinary tract but is guideline recommended as first-line treatment for stones in the kidney or upper ureter.[3] Contemporary lithotripters can fragment most stone types with low-risk, short recovery periods, and low analgesic use. Postoperative flank pain typically presents as soreness lasting 1 to 2 days. Patients may also experience self-limited hematuria. More rarely, there is a risk of hematoma.[3,5] Other documented complications, including infection, obstruction, altered kidney function, and hypertension, are even more rare, and much of the literature is outdated.[6]

Recent studies estimate the initial success rate of ESWL after one visit to be 69%, with a success rate of up to 93% after repeated treatment.[7] However, the success of ESWL may be higher depending on the stone composition, size, and the urologist's experience with the procedure (Figure 2). For patients with smaller stone sizes < 10 mm, studies have shown success rates up to 99% after initial treatment.[8] Thus, while URS may result in higher single-session stone-free rates, ESWL remains an effective option for patients with small asymptomatic stones who wish to minimize surgical side effects.

It should be noted that ESWL is generally contraindicated in pregnancy, active anticoagulation, untreated coagulopathies, and aneurysms due to risks of bleeding, although the current literature has mixed opinions on the latter.[9]

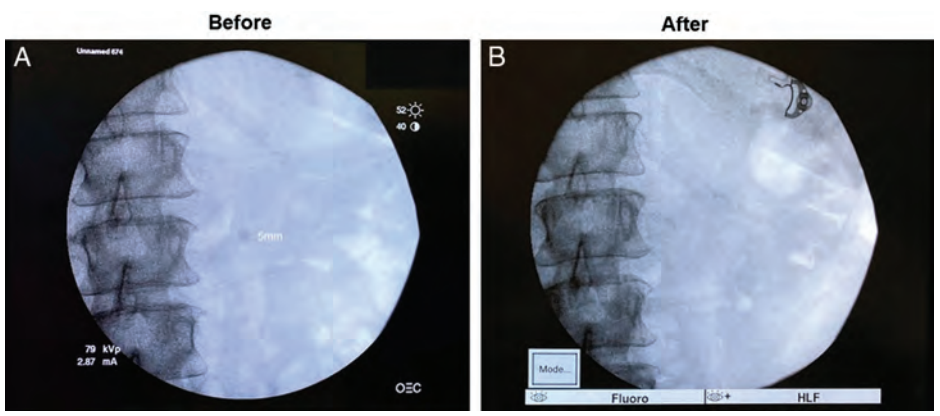

Figure 2. Extracorporeal shock wave lithotripsy outcomes. Renal calculus present before extracorporeal shock wave lithotripsy session (A) with resolution after a single session (B).

> "Therefore, patients with small renal stones should be aware of all management options when presenting to the clinic."

Tips for Improving ESWL Outcomes

ESWL is most successful in patients with small, less dense stones (<10 mm and <1500 Hounsfield units) and skin-to-stone distances < 15 cm. While there is increased clearance of upper and interpolar stones, lower pole stones < 15 mm diameter show clearance after one procedure. Urologists should consider anatomical location and renal abnormalities, such as large renal cysts near the stone or kidney malrotations, as in the case of horseshoe kidney, which may impact stone clearance. Additionally, stone composition should be considered, as cystine and denser calcium oxalate monohydrate stones may be less favorable. Finally, uric acid stones are often not visible on fluoroscopy; patients with these stones should be counseled on adjustments that may be necessary to the procedure or urged to consider URS.[10]

Conclusion

Current literature has shown that the removal of small, asymptomatic renal calculi may decrease rates of future complications such as renal colic and growth of secondary stones. Patients seeking treatment for small, nonobstructing kidney stones should be properly educated on the outcomes and complications of both URS and ESWL. ESWL continues to be an attractive treatment option. It is the only truly noninvasive kidney stone treatment and presents a safe and effective option for patients seeking an outpatient procedure without stent placement. ■

Conflict of Interest Disclosures: Dr Scotland reported being a consultant for Storz Medical and an advisor for Advanced MedTech.

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ERRATUM

AUA2024 Plenary Recap: Avulsed Ureter, a Urologist's Nightmare, and How to Avoid and Repair: Erratum

AUANews, August 2024, Volume 29, Issue 8, Page 4.

The last 2 sentences of the "How to Avoid" section have been changed to "If the rigid scope is stuck from advancing too far, use a small endoscope to incise the ureteral orifice medially to release the scope. If the scope is stuck in the deflected position, straighten manually with a coaxial dilator alongside the scope or cut the handle of the URS and cut distal end with percutaneous access." This change has been made online: https://auanews.net/issues/articles/2024/august-2024/aua2024-recap-avulsed-ureter-a-urologists-nightmare-and-how-to-avoid-and-repair

My Experience as a 2024 AUA/JUA Exchange Program Scholar: An Unforgettable Academic and Cultural Immersion

Nirmish Singla, MD, MSCS, FACS
The Brady Urological Institute, Johns Hopkins University School of Medicine, Baltimore, Maryland

I had the honor and privilege to participate as an exchange scholar in the 2024 AUA Exchange Program with the Japanese Urological Association (JUA). During my exchange, which took place in April 2024, I spent considerable time with the faculty and residents in the Department of Urology at Dokkyo Medical University in Japan, led by Professor Takao Kamai (Figures 1 and 2). The experience culminated with the 111th Annual Meeting of the JUA in Yokohama on April 25 to 27, 2024 (Figures 3-5).

This was a truly unique opportunity to learn how urology is practiced in Japan and to gain exposure to the Japanese health care system. Dokkyo Medical University Hospital

Figure 1. Dokkyo Medical University in Mibu, Tochigi Prefecture, Japan.

Figure 2. Faculty and residents in the Department of Urology at Dokkyo Medical University gather for a welcoming party at a traditional Japanese restaurant.

Figure 3. Scholarship Forum at the 111th Annual Meeting of the Japanese Urological Association in Yokohama, featuring the exchange scholars from the AUA and the European Association of Urology.

Figure 4. Faculty, residents, and students representing the Department of Urology at Dokkyo Medical University at the 111th Annual Meeting of the Japanese Urological Association.

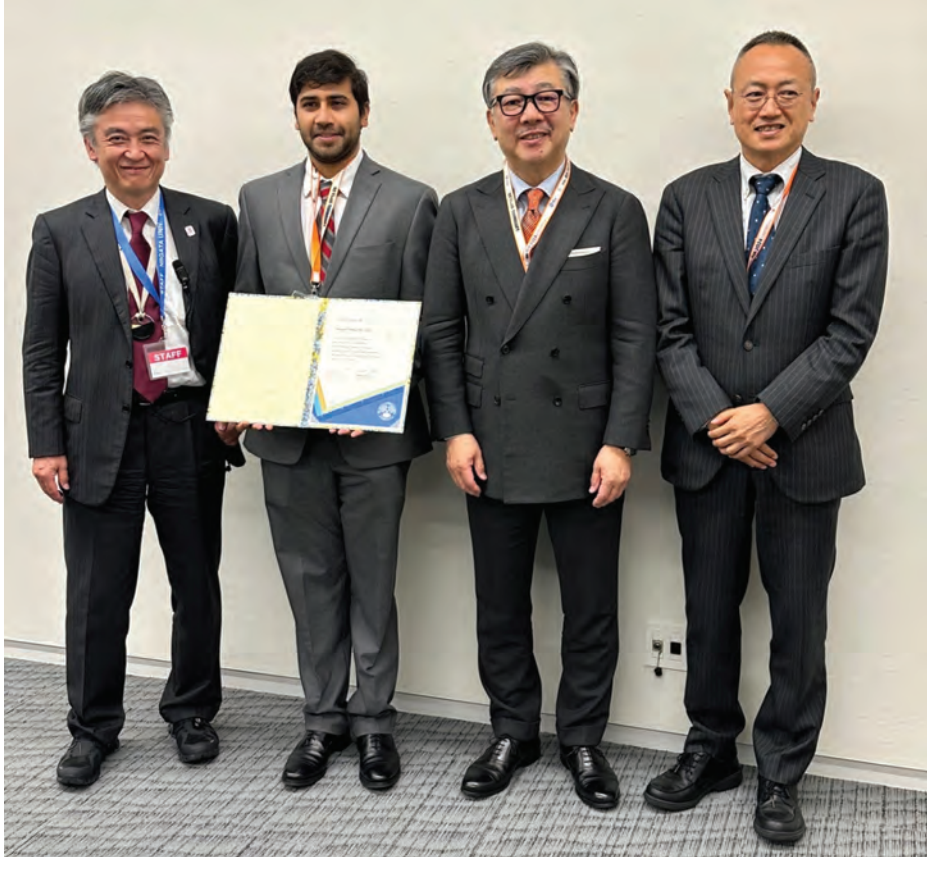

Figure 5. Presentation of awards to the AUA scholars by Professor Yoshihiko Tomita (chairperson of the 111th Annual Meeting of the Japanese Urological Association), Professor Masatoshi Eto (president of the Japanese Urological Association), and Professor Takahiko Mitsui.

→ Continued on page 10

MY EXPERIENCE AS A 2024 AUA/JUA EXCHANGE PROGRAM SCHOLAR

→ Continued from page 9

Figure 6. Open right adrenalectomy for a large pheochromocytoma, performed by Professor Takao Kamai.

is among the busiest hospitals in Japan, with 1195 beds at the main university hospital alone and 2 Intuitive da Vinci Xi robotic consoles. The experience provided firsthand clinical and surgical exposure, with a broad swath of open, robotic, laparoscopic, and endoscopic cases across the spectrum of urologic oncology (Figure 6).

The experience also entailed a reciprocal academic exchange of ideas with an invitation to present several lectures to the urology department on each day of my stay. My talks spanned various topics in kidney cancer, testicular cancer, upper tract urothelial cancer, and career development, followed by engaging discussions with the residents and faculty. The program helped me broaden my global professional network in urology and even helped bridge a new research collaboration between our institutions. To solidify these collaborations, we are currently building a new program at my home institution to host a postdoctoral fellow from Dokkyo Medical University in my research lab each year.

Aside from the unique clinical experiences, the social and cultural experiences were truly unforgettable. Some of the highlights of my trip outside of the hospital setting included

- Visiting Mount Fuji using the Shinkansen (bullet train) with breathtaking views of the mountain from Lake Kawaguchiko (Figure 7). Not only was I fortunate to be able to see the mountain, but I also caught the cherry blossoms (*sakura*) in full bloom.
- Touring an underground Oya stone mine near Utsunomiya with Professor Kamai.
- Visiting Nikko, a World Heritage site in Tochigi Prefecture, with Professor Toshiki Kijima and a few residents on April 23, which happened to be the anniversary of Dokkyo Medical University's founding. We changed into traditional kimonos and visited Nikko Toshogu Shrine, followed by Nikko Edo Village, where we witnessed a procession of courtesans, a ninja show, and a water performance (Figure 8).
- Visiting the historic Odawara Castle with Professors Kamai and Kijima.
- Joining the excursion to Kamakura organized by the JUA to visit numerous temples, shrines, and other historical monuments, including the famous Koutoku-in (Great Buddha) statue.

Despite being vegetarian and not knowing how to speak Japanese, I did not feel these posed challenges during my stay, as the faculty and residents at Dokkyo Medical University were extremely welcoming and hospitable.

Figure 7. View of Mt Fuji and Lake Kawaguchiko with pink cherry blossoms (*sakura*) in the foreground.

Figure 8. Wearing traditional kimonos with Professor Toshiki Kijima and accompanying urology residents in Nikko Edo Village.

Furthermore, the AUA ensured a smooth itinerary by coordinating my travel and accommodations. I want to extend a special thanks to Professors Kamai and Kijima for going above and beyond to make sure I was always taken care of and for detailing my trip on their department website (https://dept.dokkyomed.ac.jp/dep-m/uro/category5/). Aside from the invaluable professional enrichment and expanded academic network, I gained a deep and immense appreciation for Japanese history and culture by being completely immersed in it throughout my stay. I am extremely grateful to the AUA, JUA, and the Department of Urology at Dokkyo Medical University for this unique and fruitful opportunity. *Domo arigato gozaimasu!* ■

AUA AWARD WINNERS

Developing an Innovative Approach to Neurogenic Bladder Management After Spinal Cord Compromise

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Harvard Medical School, Boston, Massachusetts
The Koch Institute, Massachusetts Institute of Technology, Cambridge

Gabriel-Luis Ocampo, MS
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Neurogenic bladder (NGB) following spinal cord compromise presents a significant clinical challenge. Characterized by disrupted neural control of bladder and sphincter functions, NGB evolves from initial detrusor hyperreflexia and sphincter dyssynergia to chronic atrophy and fibrosis.[1]

NGB management is critically predicated on maintaining low bladder-storage pressures to preserve upper urinary tract function and prevent complications such as neurogenic detrusor overactivity, urinary incontinence (UI), urinary tract infections and urosepsis, and renal failure. Comprehensive assessments using urodynamic studies, postvoid residual measurements, and imaging are essential in guiding medical and surgical therapies. Current hallmarks of NGB management include intermittent catheterization and systemic pharmacologic agents, such as anticholinergics and/or β3 adrenergic agonists, which are hampered by inconsistent therapeutic adherence and potentially a partial modulation of underlying targets. Globally, these early management strategies can result in infection, local and upper tract tissue damage, and the exacerbation of neurogenic bowel and cardiovascular symptoms.

Yet, efforts to circumvent these barriers are often more invasive and adverse. For example, intravesical botulinum toxin injections carry a transient therapeutic benefit necessitating recurrent anesthesia exposure in children.[2] Augmentation cystoplasty is also associated with significant surgical, metabolic, and oncologic risks.[3] Therefore, there is a critical need for a minimally invasive, effective, and targeted solution that enhances therapeutic adherence, improves symptom control, localizes treatment to the bladder, and reduces systemic side effects and morbidity. We seek to develop an intravesical long-term drug-delivery platform that addresses these needs.

Trospium chloride (TrCl) is a competitive muscarinic receptor antagonist with minimal central nervous system penetration due to its large molecular size and polarity. Such attributes reduce the risk of cognitive side effects, which are otherwise common with other anticholinergics like oxybutynin. In clinical trials, a 20 mg oral dose of TrCl taken twice daily significantly improved NGB management, increasing bladder capacity, reducing detrusor pressure, and enhancing compliance.[4]

While it has relative benefits compared to other anticholinergics, TrCl still exerts significant systemic side effects. Yet, it also presents a unique pharmacokinetic profile that makes it preferable to other anticholinergics in the context of intravesical administration. For instance, TrCl is known for its poor oral bioavailability, which is less than 10%, and its absorption is further reduced by food intake.[5] Furthermore, TrCl is predominantly eliminated from the body in its unchanged form through renal excretion. As such, intravesical delivery of TrCl offers the advantage of high local bladder concentrations with minimal systemic absorption.[6]

Studies on single intravesical TrCl instillations in NGB patients indeed demonstrated minimal systemic absorption and substantial local efficacy.[7] Controlled-release drug delivery systems using TrCl-loaded polymer carriers have demonstrated significant reductions in spontaneous bladder contractions in porcine models.[8] Perhaps the most convincing evidence regarding long-term intravesical TrCl delivery came from a recent clinical trial in which a novel intravesical silicone device was preloaded with 800 mg of TrCl for managing nonneurogenic overactive bladder.[9] Congruent with preclinical findings indicating that the device could generate high local TrCl concentrations with minimal systemic absorption, trial results showed that the device produced local urine TrCl levels significantly higher than oral dosing with negligible systemic exposure. Subjects reported a 75% reduction in UI episodes as well as significant improvements in quality of life. While some adverse effects, such as hematuria and bladder discomfort, were noted, the study concluded that continuous exposure to supratherapeutic levels of TrCl for 6 weeks was safe, well-tolerated, and effective in reducing UI episodes and enhancing patient quality of life.

From all of this, we plan to use a rodent spinal cord injury model of NGB and TrCl as a test pharmacologic agent to assess 3 key aspects vital to the creation of any drug-delivery system (timing, dosing, and frequency) and their effects on bladder compliance, neurogenic detrusor overactivity, and UI. Building on prior experience evaluating rodent bladders via cystometry,[10] we hypothesize that (1) early TrCl therapy, (2) supratherapeutic intravesical TrCl dosing, and (3) continuous intravesical TrCl delivery will improve NGB functional outcomes.

The AUA/Urology Care Foundation™ Research Scholars Award affords us the meaningful opportunity to work with motivated colleagues to investigate ways to improve upon the current standards of care. By developing a novel intravesical drug-delivery platform, we hope to enhance therapeutic adherence, improve bladder compliance, and reduce the need for invasive procedures. We also hope to better understand the pathogenesis of NGB and how intravesical treatments can alter the disease course. Most importantly, the successful implementation of this platform in NGB patients could result in significantly improved outcomes, diminished complications, and an enhanced quality of life. ■

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AUA2024: REFLECTIONS

A Japanese Urology Resident's Perspective on the AUA Annual Meeting 2024

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Uonuma Institute of Community Medicine, Niigata University Medical and Dental Hospital, Minamiuonuma, Niigata, Japan

Introduction

I am a second-year urology resident at Niigata University in Japan. I was selected for the AUA/Japanese Urological Association Resident Program and attended the AUA Annual Meeting 2024 in San Antonio, Texas, from May 3 to 6. This was my first trip to the United States and my first attendance at the AUA, which provided an invaluable opportunity to observe and interact with the international urology community.

Meeting Experience

The meeting sessions started as early as 7:00 AM, and each room was filled with lively discussions. In the largest meeting room, plenary sessions were held throughout the day. Discussions on new treatment methods and lectures on new guidelines were held at intervals of 10 to 30 minutes. The educational content provided valuable insight into new treatments and surgical techniques.

The Resident Pavilion was one of the most crowded in the Science & Technology Hall from the first day of the conference, largely due to the Resident Bowl. The competition featured a wide range of questions, covering topics from the selection of antibiotics and the mechanisms of new drugs to more specialized subjects like the wavelength of thulium lasers and the history of San Antonio. The teams were all highly skilled, and some matches were so competitive that they required overtime to determine a winner. It was felt that holding a similar competition in Japan would be a valuable and stimulating experience.

In the Japanese Urological Association international session, the differences in clinical approaches between the United States and Japan were highlighted. In the United States, innovative diagnostics and therapies, such as prostate-specific membrane antigen positron emission tomography/CT for castration-resistant prostate cancer, are widely available and utilized. In contrast, these technologies are not yet covered by insurance in Japan, limiting their accessibility. The broader availability of such advanced diagnostics and therapies in Japan is highly anticipated.

→ Continued on page 13

A JAPANESE UROLOGY RESIDENT'S PERSPECTIVE

→ Continued from page 12

Even advanced and effective diagnostic and treatment methods may not be accessible due to financial constraints. Japan's health care system is characterized by universal health coverage, which ensures that all citizens have access to medical services and significantly reduces the financial burden on patients. This system creates an environment where patients can more easily access the medical care they need. However, it is important to be aware of the problem of overmedicalization. It is crucial to determine what medical care is truly necessary for each patient, as exemplified by the practice of active surveillance.

At the President's Reception held on the evening of May 5, I had the opportunity to converse with doctors from various international exchange programs. The event featured Tex-Mex cuisine unique to Texas, allowing us to enjoy food and drinks while communicating with many doctors.

Conclusion

My first attendance at the AUA Annual Meeting 2024 was a profound experience that not only provided exposure to the latest advances in urology, but also a comparative perspective on health care practices between the United States and Japan. I will work diligently in my daily medical practice, surgeries, and research so that I can participate in future AUA Annual Meetings as a presenter and engage in discussions with various individuals. I look forward to seeing all readers at future AUA Annual Meetings. ■

AUA2024 RECAPS

The Meaning of Mentorship

Amanda C. North, MD
Children's Hospital at Montefiore, Bronx, New York

The mission of the Society of Women in Urology (SWIU) is "to support the professional development and career advancement of women urologists and urologic researchers through education, advocacy, and mentorship." SWIU offers many different opportunities for mentorship including the annual clinical mentoring conference in January, speed mentoring, a longitudinal mentor-mentee program, and resident travel awards to help residents in urology attend the annual conference. In recognition of the importance of mentorship to the mission of SWIU, a mentorship award is given every year at the annual meeting. The Christina

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THE MEANING OF MENTORSHIP

→ Continued from page 14

Manthos Mentoring Award was first given in the year 2000. The award is to remember Dr Christina Manthos, a urologist whose career was cut short by breast cancer, and is given to honor men or women who demonstrate extraordinary mentoring skills in supporting the careers of women urologists. As the 2024 recipient of the Christina Manthos Mentoring Award, I was invited to speak at the SWIU breakfast at the AUA Annual Meeting in San Antonio, and I want to share my thoughts on this award and on mentorship.

My first SWIU event was in San Francisco in 2004. I was a fifth-year resident in urology and a new mother. While I don't remember the details of the SWIU breakfast that year, I remember feeling very inspired. Each resident in my program was required to give a brief summary of our experience at the AUA Annual Meeting at Grand Rounds, and I spoke about the SWIU breakfast. My chairman (who was surprisingly progressive and trained several women residents both before and after me) asked me why there was no Society of Men in Urology. I told him that there was indeed. It was called the AUA. (Luckily, he had a good sense of humor, too.) The growth of both women in urology and the influence and impact of SWIU has increased tremendously since that time. I credit the SWIU leadership for their creative and often courageous efforts to support women in urology. I have also been blessed with amazing colleagues–both within and outside of my institution–who have believed in me, supported me, and pushed me. I have also been lucky to train an incredible group of women urologists over the years who continue to amaze me with their clinical skill and academic achievements.

Adam Grant tells us, "We worry about making our parents proud when we should be focused on making our children proud. The responsibility of each generation is not to please our predecessors–it's to improve the conditions for our successors."[1] To me, this is one of the core principles of being a mentor or a sponsor. It is not enough to give advice or even to give opportunities. To make the field of urology better for the women who come after us, we must advocate for change. Some of that change has already begun. The American Board of Urology has made it a little bit easier for residents to take parental leave and still be eligible to graduate residency on time. The Annual Meeting is no longer held on Mother's Day Weekend (I spent my first Mother's Day at the AUA). Even better, there is now childcare available at the AUA Annual Meeting. None of these changes would have happened without advocacy. Advocacy can mean attending the annual AUA Advocacy Summit in Washington, DC, and going to meetings on Capitol Hill, but it can also mean advocating within your department for equitable distribution of unpaid committee work.

In closing, I owe a huge debt of gratitude to SWIU, my mentors/sponsors, and especially the mentees who have trusted me to support their careers. I am so proud of how far women in urology have come since I first matched in 1999, and I am looking forward to seeing the future of urology filled with women. ■

1. Grant A. *Hidden Potential: The Science of Achieving Greater Things.* Random House; 2023.

AUA AWARD WINNERS

Understanding the Relationship Between Biofilms and Calcium Stones

Daniel Massana Roquero, PhD
Stanford University, California

Daniel Massana Roquero, PhD, was one of the recipients of the 2024 Urology Care Foundation™ Research Scholar Awards. These awards provide $40,000 annually for mentored research training for clinical and postdoctoral fellows or early-career faculty. The Endourological Society sponsored Dr Massana Roquero's award.

Kidney stone disease is highly prevalent and most commonly caused by calcium stones. In most cases, calcium stones are present in patients without any apparent metabolic disorder or systemic disease.[1] It has long been thought that calcium stones originate from an imbalance in the urine salts, leading to supersaturation and precipitation in the form of crystals. While still seen as a contributing factor, research indicates that mineral supersaturation is not more prevalent in stone formers than in control groups.[2,3] In our experience, we have found that approximately 35% of calcium stones freshly collected from stone surgeries harbored a wide range of gram-positive and gram-negative uropathogens. This prompted us to consider the connection between bacteria and calcium stones from a different perspective. Assessing whether the connection between bacteria and calcium stones is causative or coincidental is essential to identify risk factors for stone formation and guide prevention and therapy. In the last decade, the association of bacteria with calcium stones has been under heavy scrutiny by several research groups, which have shown that various types of bacteria can induce or aggravate calcium stone disease.[4,5]

> "While still seen as a contributing factor, research indicates that mineral supersaturation is not more prevalent in stone formers than in control groups.[2,3]"

In this proposal, we aim to study the influence of bacteria in calcium stone, with a particular focus on the role that bacterial biofilms play in contributing to mineralization and overall stone growth. Bacteria can adhere to solid substrates, such as stones or calcium oxalate crystals, by encasing themselves in a self-produced polymeric matrix, forming biofilms. We hypothesize that biofilms may play a role in inducing calcium crystal aggregation and encrustation and also promote the mineralization of calcium salts in their interface with the urine microenvironment. In addition, we hypothesize that calcium stones with significant bacterial burdens have specific chemical constituents and structural domains that are not found in abiotic, pure metabolic calcium stones.

Our hypotheses find strong support in naturally occurring bacterial-induced calcium stones within aqueous ecosystems. These formations, known as microbialites, arise from the intricate interplay between microbial activities, specifically bacterial metabolisms, and the heightened saturation of ions in water.[6,7] Furthermore, numerous recent studies have illustrated that bacteria can stimulate the biomineralization of calcium carbonates and calcium phosphates.[8,9]

> "We hypothesize that biofilms may play a role in inducing calcium crystal aggregation and encrustation and also promote the mineralization of calcium salts in their interface with the urine microenvironment."

Our objective is to gather robust evidence of these occurrences through an in vitro model simulating supersaturated urine and by performing a thorough biochemical exam of human-derived stones ex vivo.

Employing a rigorous in vitro model simulating hypercalciuria, we will examine the influence of patient-derived uropathogen biofilms on the processes of crystal aggregation, encrustation, and mineralization by optical and electron microscopy. Further, we aim to identify the chemical and biological constituents of patient-derived calcium stone fragments and their distribution within the stone. We will perform a high-resolution characterization of the stone's chemical and microbial composition by combining advanced characterization and imaging techniques. In addition, we will conduct an extensive mesoscopic and microscopic characterization of whole stone fragments to understand the 3D distribution of different biological and chemical constituents as well as crystal phases.

We are confident that the meticulously crafted experiments, coupled with high-resolution techniques, will yield intriguing and insightful information on the connection between biofilms and calcium stones. I am sincerely grateful to the urology community for their support, which will enable me to continue my work and grow as a young scientist on my path to becoming an independent investigator. I am thankful to my advisor, Dr Joseph Liao, for his support and the opportunity to leverage my background in chemistry in both translational medical device development and basic science research, both related to benign urological diseases. Additionally, I would like to extend my gratitude to the Department of Urology at Stanford University and external collaborators for their support. ■

> "We will perform a high-resolution characterization of the stone's chemical and microbial composition by combining advanced characterization and imaging techniques."

> "We are confident that the meticulously crafted experiments, coupled with high-resolution techniques, will yield intriguing and insightful information on the connection between biofilms and calcium stones."

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