W5: A Patient Oriented Nocturia Algorithm

Workshop Chair: Karel Everaert, Belgium
03 September 2019 09:30 - 16:00

Start	End	Topic	Speakers
09:30	09:40	Welcome and Introduction	Karel Everaert
09:40	10:00	Nocturia, what, when and how? Moderated by Roger Dmochowski and Jerry Blavias - Definitions	Hashim Hashim
10:00	10:20	Causalities	Wendy Bower
10:20	10:45	Renal physiology + vasopressin	Johan Vande Walle
10:45	11:10	LUT	Jeffrey Weiss
11:10	11:40	Break	None
11:40	12:05	Kidney	An-Sofie Goessaert
12:05	12:30	Endocrine (menopause)	Dudley Robinson
12:30	13:30	Break	None
13:30	13:55	Causaities, their diagnosis and therapy: Moderators: Paul Abrams and Andrea Tubaro - Sleep	Donald Bliwise
13:55	14:20	Cardiovascular (edema, hypertension, Heart failure)	Dirk Vogelaers
14:20	14:45	Intake (obesity, MetSy and LUTS)	Salvador Arlandis
14:45	15:10	Older people (medication, falls,…)	Adrian Wagg
15:10	15:30	Therapy of nocturia (excl antidiuresis)	Alan Wein
15:30	15:50	Patient oriented algorithm (incl antidiuresis)	Karel Everaert
15:50	16:00	Nocturia and the ICS, future, wrap up	Sherif Mourad

Aims of Workshop

Validity of the newly developed ICS patient oriented nocturia guidelines. From bench to bedside is split in from bench to guideline and from guideline to bed. It is clear that the second part is neglected and the reason why guidelines are not used, not read, so just used as easy citations. Each guideline should be followed by an educational pathway which is patient oriented and real life. Each lecture-time includes 5-10 min discussion and should be case based simulations and consensus driven education, content fully determined by the speaker.

Learning Objectives

Understand multicausal nocturia

Target Audience

Urology, Urogynaecology, Conservative Management

Advanced/Basic

Intermediate

Suggested Learning before Workshop Attendance

International Continence Society (ICS) report on the terminology for nocturia and nocturnal lower urinary tract function. Hashim H, Blanker MH, Drake MJ, Djurhuus JC, Meijlink J, Morris V, Petros P, Wen JG, Wein A. Neurourol Urodyn. 2019 Feb;38(2):499-508.

International Continence Society consensus on the diagnosis and treatment of nocturia. Everaert K, Hervé F, Bosch R, Dmochowski R, Drake M, Hashim H, Chapple C, Van Kerrebroeck P, Mourad S, Abrams P, Wein A. Neurourol Urodyn. 2019 Feb;38(2):478-498.

Hashim Hashim, Urologist, UK

Nocturia, what, when and how, definitions?

The International Continence Society recently published the terminology for nocturia and nocturnal lower urinary tract function document in a clinically and practically-based consensus report. The report encompassed five key definitions divided into signs and symptoms. The aim of the document is to aid clinical practice and research. The table below shows these definitions.

References:

1. International Continence Society (ICS) report on the terminology for nocturia and nocturnal lower urinary tract function. Hashim H, Blanker MH, Drake MJ, Djurhuus JC, Meijlink J, Morris V, Petros P, Wen JG, Wein A. Neurourol Urodyn. 2019 Feb; 38(2):499-508.
2. Basic concepts in nocturia, based on international continence society standards in nocturnal lower urinary tract function. Hashim H, Drake MJ. Neurourol Urodyn. 2018 Aug;37(S6):S20-S24.

Term	Definition
Main sleep period (New)	The period from the time of falling asleep to the time of intending to rise for the next 'day'.
First morning void (Changed)	The first void after the main sleep period.
Enuresis (Changed)	Symptom: Complaint of intermittent incontinence that occurs during periods of sleep. If it occurs during the main sleep period, then it could be qualified by the adjective "nocturnal". Sign: Intermittent incontinence ("wetting") that occurs during periods of sleep (while asleep). If it occurs during the main sleep period then it could be preceded by the adjective 'nocturnal'.
Night-time (Changed)	Commences at the time of going to bed with the intention of sleeping and concludes when the individual decides they will no longer attempt to sleep and rise for the next 'day'. It is defined by the individual's sleep cycle, rather than the solar cycle (from sunset to sunrise).
Night-time Frequency (Changed)	The number of voids recorded from the time the individual goes to bed with the intention of going to sleep, to the time the individual ends their main sleep period with the intention of rising.
Nocturia (Changed)	Symptom: 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. This should be quantified using a bladder diary. Sign: The number of times an individual passes urine during their main sleep period, from the time they have fallen asleep up to the intention to rise from that period. This is derived from the bladder diary.
Nocturnal Polyuria (Changed)	Symptom: Passing large volumes of urine during the main sleep period. This should be quantified using a bladder diary. Sign: Excessive production of urine during the individual's main sleep period. This should be quantified using a bladder diary.
Nocturnal urine volume (Changed)	Sign: Total volume of urine produced during the individual's main sleep period including the first void after the main sleep period. This should be quantified using a bladder diary.
24-hour voided volume (Changed)	Sign: Total volume of urine passed during a 24-hour period excluding the first morning void of the period. The first void after rising is discarded and the 24-hour period begins at the time of the next void and is completed by including the first void, after rising, the following day.

24-hour polyuria (Not changed)	Excessive excretion of urine resulting in profuse and frequent micturition. Defined as > 40ml per kg body weight per 24-hours.

Wendy Bower, Physiotherapist, biostatistician, Australia

Causalities of nocturia

Nocturia is highly prevalent; the aetiology is multi-factorial and differs across the age span. Younger people demonstrate a high association with diabetes, sleep disordered breathing, hormone disruption or excessive fluid intake. In older individuals, particularly those with multiple health issues, the causal pathway of nocturia is complex and commonly involves comorbidities and interactions.

Nocturia once per night occurs in up to 93% of men and 77% of community-dwelling women over 70 years. Prevalence at least twice per night is 44% in men and 34% in women (3). Table 1 summarises the increased risk of health disorders with nocturia of at least twice per night (4-7).

Table 1: Summary of health risks associated with nocturia.

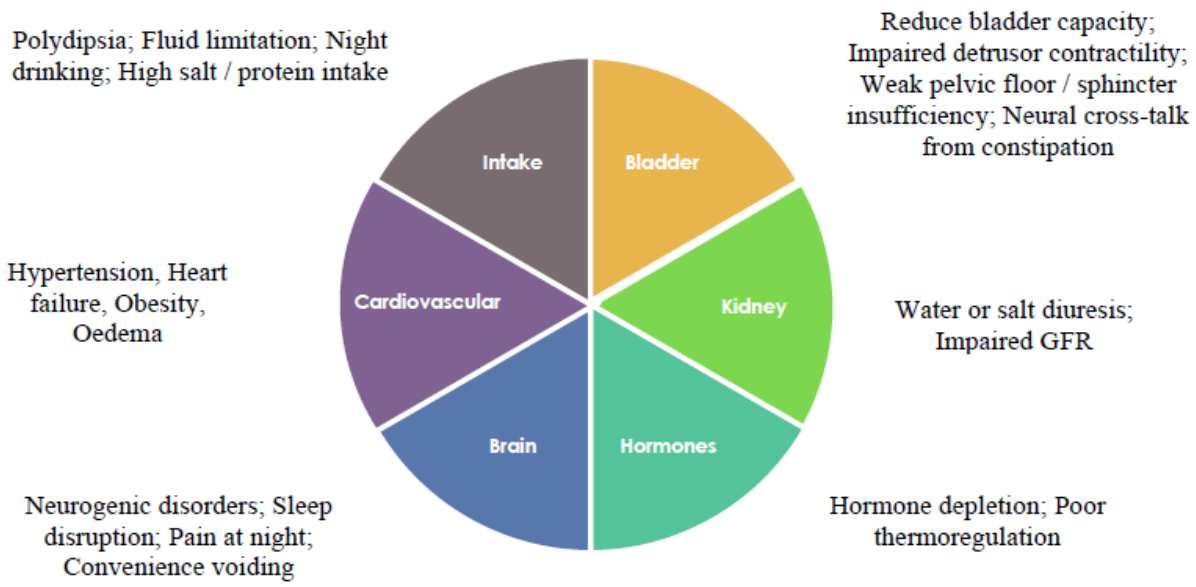
Disorder	**Odds Ratio (95% CI)**	**Odds Ratio: Female (Male)**
Using antidepressants	1.51 (0.93-2.44) to 2.8 (1.3-6.3)	5.4 (2.2)
Anxiety	3.6 (1.5-8.6)	
Hypertension	1.30 (1.09- 1.57) to 2.68 (1.55 - 4.63)	1.62 (1.4)
Cardiac disease	2.28 (1.72-3.03)	
Metabolic syndrome	1.63 (1.13-2.34) to 1.82 (1.26-2.64)	
Obesity	2.21 (1.76-2.77)	2.18 (2.07)
Type 2 Diabetes Mellitus	1.51 (1.13-2.01) to 2.62 (1.40-4.92)	
Falls Risk	2.25 (1.21-4.14)	
Death	1.98 (1.09-3.59)*	
High C reactive protein	1.64 (1.18-2.27)	2.46 (3.04)
Malignancy	2.15 (1.30-3.57)	
Taking diuretics	1.67 (1.34-2.09) to 2.66 (2.13-3.34)	1.59 (1.25)
Insomnia	2.92 (2.11-4.05)	
Sleep disordered breathing	2.44 (1.14-5,23) to 3.69 (1.67-8.12)	4.99
Restless legs	2.44 (1.14-5.23)	2.86 (2.91)

*Adjusted for known covariates.

A similar risk exists for both genders, exploding the belief that in men nocturia is prostate-dependent. Factors outside the urinary tract increase renal production of urine and disturb sleep. Given the ageing population and the known association with cognitive impairment and reduced sleep, nocturia has far reaching health implications.

Nocturia severity is sub-classified by frequency of waking to void (8). While nocturia has historically been considered a lower urinary tract symptom, being part of urgency syndrome, the symptom is commonly experienced in other conditions unrelated to bladder function. (9, 10). Figure 1 summarises the possible underlying causes of nocturia, many of which co-exist, interact and lie outside the urinary tract system (9-11).

Figure 1: Underlying causes of Nocturia in older people



Events which raise the overnight glomerular filtration rate will increase nocturnal urine volume and potentially induce nocturnal polyuria. Hypertension, particularly nocturnal hypertension, and peripheral oedema can increase nocturnal urine output beyond normal bladder storage. Disorders of solute or free water excretion may inhibit usual nocturnal anti-diuresis, as may systemic or acute illness, injury-related oedema or cardiac dysfunction (12).

Patients with frequent nocturia (i.e. ≥2 voids per night) have up to five times the risk of detrusor overactivity (13). This is usually due to urgency occurring early in the filling phase, or to incomplete bladder emptying when voiding. In the older patient reduced bladder sensation and impaired detrusor muscle contractility commonly co-exist, resulting in incomplete bladder emptying and frequent toileting for small volumes. This loss of coordination between storage and voiding is also seen in neurological conditions prevalent in older people e.g. stroke, Parkinson's disease or cognitive impairment.

The TANGO screening tool (Appendix 1) is a patient-completed, multidisciplinary screening metric that captures multiple and co-existing variables on the causal pathway of nocturia (14). Items checked as 'True' on TANGO identify variables that may have direct and interactive effects on the generation of nocturia. The clinician can see at a glance which comorbidities may be contributing to increased urine production, reduced bladder storage or sleep disturbance.

Johan Vande Walle, Paediatric Nephrologist, Belgium
Renal physiology + vasopressin

Nocturnal diuresis volume is largely influenced by 5 pathophysiologic mechanisms 1) renal glomerular and tubular functions, including ageing processes 2) circadian rhythms of the kidney 3) overall circadian rhythms interfering with the kidney (neurologic, hormonal, cardiac, venous etc)) 4) life-style (nutrition, fluid). 5) drug induced.

1) Renal function is often reduced to GFR and/or diuresis-volume, but tubular functions are underestimated.
2) Circadian rhythms of the kidney : More than 20 genes, mainly in the tubulus have documented gene specific circadian rhythms. Although they are under control of the central circadian rhythms in the adolescent and the young adult, this control is progressively lost in the elderly. But there are certainly genetic predispositions, as is documented in the nocturnal enuresis patients, who are developing significant nocturia already in their 30's
3) Overall circadian rhythms are interfering with the circadian rhythm of the kidney: Neurotransmitters are playing a dominant role, as is documented in autism, ADG$HD, Alzheimer, Parkinson. There is obvious correlation with hormonal circadian rythms as the renin-aldosteron-system, melatonin, cortisol, ANP/BNP and vasopressin, Prostaglandins. The documented absent circadian rhythm of vasopressin in the nocturia group, offers the potential of therapeutic anti-diuretic intervention by desmopressin. However there are two archetypes: Nocturnal polyuria without association of increased solute excretion overnight, will be likely to be good desmopressin responder. The archetype where the increased nocturnal solute excretion drives the nocturnal polyuria, or absent nocturnal dipping, may have secondary

decreased vasopressin levels, but is therefore likely to be only partial responder. Sodium and water retention in cardiac or venous insufficiency syndromes are the prototypes of this)

4) Life-style, including nutrition and fluid intake, but especially sleep-hygiene have major influence on circadian rhythm.
5) All drugs influencing biorhythms and/or renal functions have an underestimated influence of renal circadian rhythms. Timing of administration of diuretics, steroids are crucial. Drugs like NSAID's and ACE-i..respectively prostaglandin and renin-aldosteron disrupt normal circadian rhythm, but in fact every drug who has primary or secondary renalk effects. Chronotherapy therefore offers a lot of potential

Jeffrey Weiss, Urologist, USA
LUT and nocturia

Evaluation of nocturia commences with history and physical examination, urinalysis, post void urine volume determination and analysis of the 24 hour frequency volume chart. The latter yields categories of nocturnal urine overproduction/polyuria, diminished bladder capacity, mismatch between nocturnal urine production and bladder capacity, diminished tendency to void at night in comparison with patients' own capacity and global/24 hour polyuria. While much nocturia is attributed to nocturnal or global urine overproduction, the urologist is traditionally asked to evaluate small capacity bladder which can manifest globally or exclusively during the sleep period. Lower urinary tract issues contributing to nocturia include infravesical obstruction, detrusor overactivity, pelvic floor dysfunction, primary bladder diseases such as radiation cystitis or cancer, bladder or ureteral stones and functional neurologic disorders. Urologists have had little success in treating small bladder capacity outside of patients with urgency/overactive bladder, even with transurethral prostatic resection which while highly effective in increasing flow and reducing post void residual, is less effective in mitigating nocturia. Since strategies abound to decrease nocturnal urine production rate, one possibility is decreasing urine production even when baseline falls outside of limits generally understood to be consistent with nocturnal polyuria. That is, better alignment of bladder capacity and urine output regardless of whether patients have nocturnal polyuria is a rational approach to LUT-causes of nocturia in the current era which lacks strategies to increase bladder capacity in a reliable manner.

An-Sofie Goessaert, Urologist, Belgium
Kidney and nocturia

From a urological point of view, nocturia can be the result of a bladder dysfunction with small bladder capacity, or the result of a kidney dysfunction when the nocturnal urine output exceeds the bladder capacity, causing nocturnal polyuria (NP).
NP could be considered a normal aging process; it is known that with advanced age loss of circadian rhythms of diuresis-regulating hormones, renal concentrating and sodium conserving capacity occur. However, the NP population does not consist merely of older people, indicating that this process is already installing at a younger age in a considerable proportion of the study population.

In healthy children, a pronounced circadian rhythm with a nocturnal decrease in diuresis rate and excretion of solutes and a nocturnal increase of urinary osmolality is found. In adults, the circadian rhythm of diuresis progressively disappears and NP installs from the age of 20-30. This also means that NP on itself does not have to be a problem. When it leads to bothersome symptoms, however, such as nocturia or nocturnal enuresis, treatment is warranted.
NP is a heterogeneous condition, in which water diuresis, sodium diuresis or a combination are at the basis. In case of water diuresis, an increase of free water clearance and a decrease in osmolality is mainly found in the beginning of the night, whereas in sodium diuresis sodium clearance remains high throughout the night. Both pathophysiological mechanisms are caused by different hormonal imbalances which reach far beyond the scope of urologists, and which also explains why nocturnal polyuria is not easy to treat. Underlying problems such as hypertension, sleep apnea, venous insufficiency can contribute to this nocturnal urine overproduction and need to be treated first before considering NP as an idiopathic condition.
Conservative measurements such as adapting drinking behavior, increasing physical activities, reducing sodium intake are the cornerstone in treatment of NP, but if no underlying pathologies are found or if these are optimally treated without a positive effect on NP and nocturia, antidiuretic treatment can be prescribed to lower water diuresis. This is the only approved medical treatment for nocturia. In case of sodium diuresis, lowering sodium clearance at night with diuretics during daytime could bring a solution, however, this is not a validated treatment.
This means that when diagnosing nocturnal polyuria, the most important step in the patient oriented algorithm is to search for red flags that might indicate underlying medical problems.

Dudley Robinson, Gynaecologist, UK
Endocrine (menopause)

Lower urinary tract symptoms are known to increase with age and 50% of women associate troublesome urinary symptoms with the onset of the menopause. There is now increasing evidence to support the role of oestrogen deficiency in the pathogenesis of Overactive Bladder (OAB) and the symptom of nocturia.

Nocturia is a common lower urinary tract symptom and epidemiological studies have suggested that it is the most common troublesome symptom associated with Overactive Bladder (OAB) syndrome.

Oestrogen has been shown to inhibit the function of Rho-Kinase in the bladder smooth muscle and by doing so affects smooth muscle contractility. In addition oestrogen affects voltage gated Big Potassium (BK) channels and this also has an effect on detrusor muscle contractility by regulating Ca2+ conductance. Furthermore, oestrogen deprivation has been shown to cause changes in urothelial thickness and a reduction in Zona Occuldens tight junction proteins which may increase the risk of developing OAB.
In addition there is also evidence to suggest that oestrogen has a direct effect on water and salt regulation in the kidney and, by doing so, may influence diuresis rates and be an underlying factor in nocturnal polyuria, the commonest cause of nocturia. This is also supported by work demonstrating an effect on vasopressin secretion associated with fluctuations of the female sex hormones during the menstrual cycle.

This presentation with examine the role of oestrogen in the pathogenesis of nocturia associated with OAB as well as nocturia secondary to underlying nocturnal polyuria In addition translation into clinical practice will be covered by examining the evidence supporting the use of local oestrogen therapy in the management of postmenopausal women with nocturia secondary to underlying OAB and nocturnal polyuria.

Donald Bliwise, Sleep specialist, USA
Sleep and Nocturia: Associations, Causality and Treatment

The classic Hill criteria (Proc R Soc Med 1965; 58: 295-300) for determining epidemiologic causality become a thorough and convenient framework to examine whether nocturia can be considered a cause of sleep disturbance. My presentation will focus on a broad overview of the worldwide literature involving nocturia and sleep that will deal with the following criteria: strength of association, consistency of association, specificity of association, biological plausibility, temporal precedence and experiment (intervention). Evidence in each of these areas will be presented, and I will provide a critical examination to what extent empirical studies in each of those domains support or do not support the hypothesis that nocturia disrupts sleep, as opposed to alternative hypothesis, i.e. that disrupted sleep can itself be a cause of nocturia. Although academically of interest, these contrasting points of view are especially noteworthy because they dictate treatment decisions that have as their origin in the assumption of causality. I will limit my overview to human work, but will include descriptive, physiologic and interventional research and also present cross-sectional and longitudinal studies from the literature that bears upon these issues.

Dirk Vogelaers, Internal medicine, Belgium
Cardiovascular system and nocturia (edema, hypertension, Heart failure)

Salvador Arlandis, Urologist, Spain
Intake, metabolic syndrome and nocturia

Metabolic syndrome (MetS) is a clinical entity defined by three or more of: waist perimeter > 102 man and 88 cm woman, serum triglycerides > 150 mg/dL, cholesterol HDL < 40 mg/dL man and < 50 mg/dL woman, blood pressure ≥ 130/85 mmHg and glucose ≥ 110 mg/dL. MetS is a growing pandemic and increases with age, with a prevalence over 40% in men and women over sixties. This figures will be even higher in the next future, probably due to dietary changes, growing sedentary and obesity, specially in west countries.

In last years there is an increasing evidence of a MetS and LUTS link. NAHNES III survey found that diabetes mellitus and hypertension increase odds of LUTS (OR 1.65 and 1.76 respectively). Another longitudinal study including more than 18000 men found obesity as a risk factor to develop LUTS: increasing BMI, waist perimeter and weight increase risk of LUTS by 61%, 39% and 31% respectively.

But not only the different components of MetS may play a role in the appearance of LUTS. Physical activity may be a protective factor. A cohort study in men ≥65 years old found that a daily walk for exercise reduces 20% risk of LUTS reaching 29% in those subjects with higher physical activity scores. Therefore, we can argue that sedentary may produce the opposite effect.

There have been described several potential mechanisms for LUTS progression. Obesity is associated with low testosterone levels, high estrogens and hyperinsulinemia; estrogens induce upregulation of RhoA/ROCK pathway and M3 receptors activation; hypersinsulinemia induce prostate growth (through insuline-like grow factor1); reduced physical activity increase sympathetic activity and increased serum glucose produce parasympathetic neurotoxicity.

Another well known association is MetS and benign prostatic enlargement (BPE). A systematic review showed that patients with MetS had significantly higher total prostate volume when compared with those without MetS. Meta-regression analysis showed that differences in total prostate volume were significantly higher in older, obese patients and low serum high-density lipoprotein cholesterol concentrations.
Some studies have explored the hypothesis that patients with MetS and BPE show worse drug responsiveness. One study showed that MetS was an independent factor for doxazosin non-responder (OR 4.26). The rate of doxazosin responder and total IPSS improvements in patients with MtS significantly decreased as the number of MetS components increased. In a cohort study of 100 patients (47 with MetS and 53 without MetS), mean volume of the prostate was significantly higher in MetS patients than in patients without MetS (57±32.65 mL compared with 46.00±20.19 mL, p=0.036). The control group demonstrated an 11-unit reduction in IPSS, whereas those with MetS showed a reduction in the symptom score of only 6 units ($p < 0.001$).
The rationale that reversing risk MetS factors will improve LUTS was explored in a prospective multicentre cohort study including 86 morbid obese patients, followed up one year after bariatric surgery. At 6 weeks, there was a significant reduction in IPSS overall symptom score and this improvement was sustained at 1 year.

Morover, some studies have shown a 2.50 OR of overactive bladder in women with MetS, and a higher prevalence of stress urinary incontinence in pre and postmenopausal women with MetS.

Some questions remain unclear. Links between insulin resistance and LUTS as well as ethnic disparities found in several studies, are questions that need further investigation. The real impact of life style changes and fixing components of MetS, will need to be evaluated in large prospective cohort studies.

Adrian Wagg, Geriatrician, Canada
Older people (medication, falls,…)

A Patient Oriented Nocturia Algorithm
Alan J. Wein MD

Nocturia is a specific symptom in its own right with a wide ranging number of possibilities for pathophysiology. It is associated with significant negative outcomes in terms of patient health, but the reverse has never been proven, i.e., that correction or improvement of nocturia results in a lessening or disappearance of those negative outcomes. There is no consensus on how to manage nocturia for best possible outcomes.

The ability of the bladder to store urine normally at night, thereby permitting a sleep throughout without awakening depends on:

(1) Maintaining a low pressure inside the bladder;
(2) Normal sensation as the bladder fills;
(3) No involuntary bladder contractions;
(4) Adequate sphincter function;
(5) Adequate bladder capacity with near complete emptying;
(6) No excess urine production at night;

Simple logic would dictate that to decrease nocturia, there are only three possible pathways. One is to decrease bladder activation on the motor and/or sensory side of the micturition cycle, here we are referring mainly to treatment of BPH or OAB. One is to decrease residual urine and thereby increase functional bladder capacity. One is to decrease urine production.

Under simple management strategies, one should start with the obvious, and that is to try and correct or better control the following: excess fluid intake, diabetes, congestive failure, peripheral edema, hypertension (especially hypertension that does not go down in the evening), and sleep apnea.

Behavioral and lifestyle modifications include, preemptive voiding, decreasing nocturnal and late afternoon fluids, dietary advice, especially regarding caffeine, alcohol, salt. Also, exercise and weight loss, medication timing (such as substituting a late afternoon diuretic for an early morning one), and compression stocking with afternoon and evening leg elevation if there is peripheral edema.

As far as agents to treat overactive bladder are concerned, medications to treat lower urinary tract dysfunction in men have not been significantly better than placebo in long term use. Data on overactive bladder medications generally have a female predominance. These have not been significantly better than placebo in short term use and it is an assumption that this would also apply to male only populations. Quotes abound from the EAU Guidelines Committee and from other committees and learned individuals that "little response has been seen from anticholinergic agents and alpha blockers". Do these agents favorably affect nocturia? The answer is yes, but by not very much, and that applies to all the antimuscarinics, agents with mixed effects, alpha blockers, and phosphodiesterase inhibitors. One must remember, at least, with obstructive BPH therapy that if one starts with a population of individuals who void 3 or more times at night, after one year with no active treatment, approximately half of these people will have decreased their nocturia by at least 1 episode. The placebo rate in studies regarding nocturia is considerable. What is this due to? If one extrapolates from the placebo rate in overactive bladder trials, this may well simply be due to unconscious fluid restriction.

Non-steroidal anti-inflammatories, which inhibit prostaglandin synthesis, have also been clinically trialed for nocturia. The effects of these, if any, could be on detrusor overactivity or a decrease in nocturnal urine volume, or both. Again, the results have not been terribly impressive.

All this is not to say that one should not start therapy in patients that have "typical" BPH or OAB with the agents usually utilized to treat these, that is, if symptoms co-exist during the day as well as at night. However, according to what is in the literature, and I am sure your personal experience is the same as mine, there are effects, but when strictly compared to placebo, there is a minimal decrease in nocturia episodes or increase to the time of first awakening.

That raises an important question: How important is it to emphasize the placebo effect in these studies, since it is inseparable from the overall clinical effect of administering a drug that admittedly has a powerful placebo effect in this condition?

Karel Everaert, Urologist, Belgium

Patient oriented algorithm (incl antidiuresis)

Patients with nocturia have to face many hurdles before being diagnosed and treated properly. The aim of this paper is to: summarize the nocturia patient pathway, explore how nocturia is diagnosed and treated in the real world and use the Delphi method to develop a practical algorithm with a focus on what steps need to be taken before prescribing desmopressin.

Causalities: Historically, formal evaluation of nocturia has been compartmentalized into medical specialties as this symptom is likely to be encountered in a diverse range of clinical contexts. This approach makes a more patient oriented diagnosis and therapeutic algorithm possible in comparison to the classical "global polyuria / nocturnal polyuria / reduced bladder capacity" algorithm or the abnormal circadian rhythm of "bladder /kidney /sleep" diagram. Another practical approach with regards to efficacy and safety of antidiuretic therapy is linking causalities to vasopressin physiology and pathophysiology.

Diagnostic packages: consensus on, history taking for all causalities, intake diary (fluid, food) and bladder diary, not for its duration. Pelvic (women) or rectal (men) examination, prostate-specific antigen, serum sodium check (SSC), renal function, endocrine screening: when judged necessary. Timing or empty stomach when SSC is not important.

Therapeutic packages: the safe candidates for desmopressin can be phenotyped as no polydipsia, heart/kidney failure, severe leg edema or obstructive sleep apnea syndrome. Lifestyle interventions may be useful.

Initiating desmopressin: risk management consensus on three clinical pictures. Follow-up of desmopressin therapy: there was consensus on SSC day 3 to 7, and at 1 month. Stop therapy if SSC is <130 mmol/L regardless of symptoms. Stop if SSC is 130 to 135 mmol/L with symptoms of hyponatremia.

A summary of the nocturia patient pathway across different medical specialists is useful in the visualization and phenotyping of patients for diagnosis and therapy. By summarizing basic knowledge of desmopressin, we aim to ease its initiation and shorten the patient journey for nocturia.