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International Continence Society (ICS) report on the terminology for nocturia and nocturnal lower urinary tract function

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Introduction: The terminology for nocturia and nocturnal lower urinary tract function is reviewed and updated in a clinically and practically-based consensus report.

Methods: This report has been created by a Working Group under the auspices and guidelines of the International Continence Society (ICS) Standardisation Steering Committee (SSC). All relevant definitions were updated on the basis of research over the last 16 years since the publication of the first nocturia standardization document in 2002. An extensive process of 16 rounds of internal and external reviews was involved to examine each definition exhaustively, with decision-making by collective opinion (consensus).

Results: A clinically-based terminology report for nocturia and nocturnal lower urinary tract function, encompassing five key definitions divided into signs and symptoms has been developed. Clarity and user-friendliness have been key aims to make it interpretable by healthcare professionals and allied healthcare practitioners involved in the care of individuals with nocturnal lower urinary tract function.

Conclusion: A consensus-based terminology report for nocturia and nocturnal lower urinary tract function has been produced to aid clinical practice and research.

KEYWORDS
enuresis, International Continence Society, nocturia, nocturnal polyuria, terminology

1 | INTRODUCTION

In 2002, the International Continence Society (ICS) defined nocturia as the complaint that the individual has to wake at night one or more times to void.[1] Since that original publication, several studies have been conducted looking at the epidemiology, pathophysiology and treatment of nocturia, leading to a wealth of new information.[2,3] The time has now come to review the terminology in the original publication since it has been established that nocturia may not be a

Hashim Hashim, Marco H. Blanker, Marcus J. Drake, Jens Christian Djurhuus, Jane Meijlink, Vikky Morris, Peter Petros, Jian Guo Wen, and Alan Wein: ICS Terminology Working Group on Nocturia and Nocturnal Lower Urinary Tract Function.

Marcus J. Drake and Jane Meijlink: Standardisation Steering Committee ICS. At time of publication, Marcus Drake was an ICS Trustee.

complaint and that people can get up at night to void for various reasons which may or may not be pathological.[4] Nocturia can also occur as a clinical entity in its own right due to non-medical reasons such as a baby crying, or a partner snoring, causing the individual to wake up at night to pass urine. In these latter scenarios, nocturia would have been excluded in the 2002 definition as the person would have not woken up to void due to a complaint, but rather due to a convenience void.

Nocturia may also be present as part of other conditions which may or may not be directly related to the urinary tract, for example, heart failure or sleep apnea. Therefore, patients can present to and consult not only urologists but also other clinicians such as gynecologists, geriatricians, neurologists, sleep experts, endocrinologists, cardiologists, immunologists, rheumatologists, and/or general practitioners. Each specialist is likely to approach nocturia in a different way depending on the presentation. However, it is important that all healthcare providers speak the same "language" and refer to the same condition using specific definitions, in order to avoid confusion and any misunderstandings.

The ICS therefore formed a new working group to revise and update the 2002 standardization document on nocturia and make new recommendations on terminology based on the published literature over the last 16 years. This terminology report is inherently and appropriately a definitional document, collating the definitions of those terms, that is, "words or phrases used to describe a thing or to express a concept, especially in a particular kind of language or branch of study,"[5] here nocturia and nocturnal lower urinary tract function. Emphasis has been on comprehensively including those terms in current use in the relevant peer-reviewed literature. The definitions of those terms will be reviewed with all available evidence and aim to assist clinical practice and research. Some new and revised terms have been included. Explanatory notes on definitions have been referred, where possible, to the "footnotes" section. This document does not address the epidemiology, pathophysiology or treatment of nocturia or any of its sub-categories, as that is not the main aim of the Standardisation Steering Committee (SSC) or the nocturia working group, is beyond the scope of this article, and is covered in several other publications.[2,3,6–11]

Like all other joint ICS terminology reports, every effort has been made to ensure this report is:

User-friendly: It should be understandable by all clinical and research users.

Clinically-based: The definitions should be applicable to clinical practice.

Original: Where a term's existing definition (from one of multiple sources used) is deemed appropriate, that definition will remain and be duly referenced.

Able to provide explanations: Where a specific explanation is deemed appropriate to describe a change from earlier definitions or to qualify the current definition, this will be included as an addendum to this paper (*Footnote [FN] 1,2,3. . ..).* Wherever possible, evidence-based medical principles will be followed.

It is suggested that acknowledgement of these standards in written publications related to nocturia and nocturnal lower urinary tract function be indicated by a footnote to the section "Methods and Materials" or its equivalent, to read as follows: "Methods, definitions and units conform to the standards recommended by the International Continence Society Nocturia and Nocturnal Lower Urinary Tract Function Terminology Standard 2018, except where specifically noted".

Relevant ICS 2002 and 2010 definitions are highlighted for ease of reference and comparison. The 2018 definitions (Table 1) will be added if there are any changes to the previous definitions.

2 | GENERAL DEFINITIONS

2.1 | Symptom(s)

2002: The subjective indicator of a disease or change in a condition as perceived by the patient, carer or partner, and may lead him/her to seek help from healthcare professionals. Symptoms may either be volunteered or described during the patient interview. They are usually qualitative. In general, Lower Urinary Tract Symptoms (LUTS) cannot be used to make a definitive diagnosis. LUTS can also indicate pathologies other than lower urinary tract dysfunction (LUTD), such as urinary tract infection.[12]

2010: Any morbid phenomenon or departure from the normal in structure, function, or sensation; experienced by the person and indicative of disease or a health problem. Symptoms are either volunteered by, or elicited from the person, or may be described by the person's caregiver.[13,14]

2018: The previous definitions have not been changed.

2.2 | Sign(s)

2002: Signs are observed by the physician including simple means, to verify symptoms and quantify them. For example, a classic sign is the observation of leakage on coughing. Observations from frequency/volume charts, pad tests and validated symptom and quality of life questionnaires are examples of other instruments that can be used to verify and quantify symptoms.[12]

2010: Any abnormality indicative of disease or a health problem, discoverable on examination of the

TABLE 1 Definitions of terms related to nocturia and nocturnal lower urinary tract function (2018)

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-h voided volume (changed)	Sign: Total volume of urine passed during a 24-h period excluding the first morning void of the period. The first void after rising is discarded and the 24-h period begins at the time of the next void and is completed by including the first void, after rising, the following day.
24-h polyuria (not changed)	Excessive excretion of urine resulting in profuse and frequent micturition. Defined as >40 mL per kg body weight per 24-h.

patient; an objective indication of disease or a health problem.[14]

These can be quantified by a questionnaire or bladder diary.

2018: The previous definitions have not been changed.

Nocturnal: Refers to "Done, occurring, or active at night."[5] Therefore, "nocturnal" will refer to signs and symptoms that occur during the night-time.

Night-time (Changed): For the purposes of the nocturia 2018 terminology, night-time will be defined by the individual's sleep cycle, rather than the solar cycle (from sunset to sunrise). Thus, some shift workers may have their "night-time" period during the daylight hours, as it is the time of their main sleep period. It 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."

Main sleep period (New): The period from the time of *falling asleep* to the time of *intending to rise* for the next "day."

Frequency: The frequency is the number of times an event occurs during a stated period.

3 | NOCTURNAL SYMPTOMS

3.1 | Nocturia

2002: The complaint that the individual has to wake at night one or more times to void.[1]

2010: Complaint of interruption of sleep one or more times because of the need to micturate.[14] Each void is preceded and followed by sleep.

2018: 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.[a]

3.2 | Core reasons for change

The 2002 and 2010 definitions of nocturia have caused much debate and controversy, including the fact that getting up once at night to void may not be bothersome and is therefore not a "complaint." Furthermore, it can be difficult to determine the "reason for waking" and to confirm that waking was indeed in order to pass urine. What clinicians and researchers wanted

was to define a clinical condition. Also, the previous ICS definitions of nocturia did not take into account the voiding episodes at night during the main sleep period of several groups of people, including but not limited to:

1. those who need to void multiple times in the night after falling asleep, often several times in a row, small amounts at a time, and may not be able to get back to sleep again,
2. those whose bladder does not empty fully, and who consequently need to void again several times soon after going to sleep,
3. those who suffer from insomnia or have difficulty going back to sleep due to causes other than their bladder problem,
4. those who wake up and then are unable to sleep due to painful or sensitive bladders.

Furthermore, while various studies have been published on nocturia, only few have critically discussed the definition of nocturia. In fact, nocturia has not been defined at all in many studies. The new definition reflects the fact that nocturia is first a symptom, which may or may not be a complaint (ie, of an abnormality), with mixed and multiple etiologies and a prevalence in the general population which is well described for men and women of different ages worldwide.[2,15,16]

Night-time frequency can sometimes be confused with nocturia. However night–time frequency includes voids when an individual goes to bed, with the intention of sleeping, but cannot sleep and needs to void at least once before falling asleep (2002 nocturia document). For example, if an individual goes to bed at 10 pm and passes urine three times before falling asleep at 11pm, then the three episodes are not part of nocturia, as nocturia starts when the person falls asleep but these are part of night-time frequency (Figure 1).

Another, scenario that may cause confusion is if an individual wakes up at, for example, 3 am from sleep and could not sleep although they want to sleep, and passes urine at 4 and 6 am, and then decides to end his/her sleep period at 7 am, then these voids are part of nocturia episodes.

In other words, nocturia episodes begins when the individual falls asleep and ends with the intention of getting up for the day. These, and other scenarios, will be highlighted by careful analysis of the bladder diary, which is a mandatory first-line investigation tool for the management of patients with LUTS (Figure 2). This document aims is to generalize the definitions to apply to all groups of patients with the symptom of nocturia.[b]

3.3 | Analysis of bladder diary

1. Nocturia by 2002/2010 definition: 1 (the only void that was preceded and followed by sleep was the one at 23.00). It could also be argued that nocturia could be three episodes as the voids at 1.00am and 3.00am were preceded and followed by sleep but the return to sleep was delayed. This depends on whether the definition is strictly applied or not. Either way, the definition misses out on nocturia episodes.
2. Nocturia by 2018 definition: 4 (the total number of voids after falling asleep at 22.30 and before the individual decides to get up for the day at 08.00).

	Scenario				
	1	**2**	**3**	**4**	**5**
Time					
10pm	Bed & Sleep	Bed	Bed	Bed	Bed
11pm		X	X	X	X
12am		Sleep	Sleep	Sleep	Sleep
1am					
2am	Wake to void X Sleep after Void	Wake to Void X Sleep after Void	Wake to Void X	Wake to Void X	Wake to Void X Sleep after Void
3am				X	
4am	Wake to Void X Sleep after Void	Wake to Void X Sleep after Void	X Sleep after Void	X Sleep after Void	Wake to Void X
5am					X Intention to Sleep but not able to
6am					
7am	Wake & Rise for the day	Wake & Rise for the day	Wake & Rise for the day	Wake & Rise for the day	Rise for the day
	NF: 2 N2002: 2 N2018: 2	NF: 3 N2002: 2 N2018: 2	NF: 3 N2002: 0 N2018: 2	NF: 4 N2002: 0 N2018: 3	NF: 4 N2002: 1 N2018: 3

FIGURE 1 Different scenarios highlighting difference between the different definitions of night-time frequency (NF), previous nocturia definition (N2002), and new nocturia definition (N2018). (X denotes micturition)

Night-time	
Time	Voided volume (mL)
Time of falling asleep: 22.30	
23.00	100 (woke up to void and went back to sleep)
01.00	150 (woke up to void but could not sleep after void although wanted to sleep)
03.00	100 (voided again and then fell asleep)
06.00	200 (woke up to void but could not sleep after void although wanted to sleep)
08.00	100 (decision to get up for the day)

FIGURE 2 Example of nocturia using a single night extracted from a bladder diary[c]

3.4 | Nocturnal polyuria (NP)

2002: Not defined as a symptom.
2010: Not defined as a symptom.
2018: Passing large volumes of urine during the main sleep period. This should be quantified using a bladder diary.

3.5 | Core reasons for change

The previous standardization reports have not highlighted nocturnal polyuria as a symptom, but looked at it as a sign. However, we know from clinical practice that patients can report passing large volumes of urine at night, especially relative to the day, and hence we have defined the symptom of nocturnal polyuria.

3.6 | Enuresis

2002: Any involuntary loss of urine. If it is used to denote incontinence during sleep, it should always be qualified with the adjective "nocturnal."[1]
2010: Complaint of involuntary loss of urine which occurs during sleep.[14]
2018: 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." The patient has to be asleep when enuresis happens and is usually unaware of it. If the patient is woken from sleep and then leaks or has incontinence then this would be classified according to the pathophysiology of incontinence while awake, for example, stress urinary incontinence, urgency urinary incontinence, mixed urinary incontinence, etc. The timing of leakage, whether during sleep or after being woken up and then leaking, is established when taking a detailed clinical history from the patient by asking them, for example, "Does the wetting/leakage occur while you are asleep and unaware of it or do you get woken up and then leak?"[d]

3.7 | Core reasons for change

Enuresis is a symptom reflecting several different pathologies, previously believed to be a complete emptying of the bladder, but later identified as both complete and incomplete emptying of the bladder. The International Children's Continence Society (ICCS) defined nocturnal enuresis as both a symptom and a condition of intermittent incontinence that occurs during periods of sleep.[17–19] Previously it was wetting in discrete portions while asleep after the age of five. To ensure consistency between the ICCS and the ICS definitions, the ICS has adapted the ICCS definition.

4 | NOCTURNAL SIGNS

4.1 | Nocturia

2002: Not specifically defined.
2010: Not specifically defined.
2018: 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.

In order to capture the frequency of nocturia, a bladder diary is needed on which the patient indicates the time of

falling asleep, the time when they decided they would no longer attempt to sleep, and all intervening voids. A bladder diary is needed to ascertain nocturnal urine production, with complete recording of all volumes voided during the main sleep period. Measurement of the frequency of nocturia begins after sleep and concludes before the first void following intention of getting up for the day.[e] The individual can also note why they went to void, for example, due to urgency, pain, etc.

4.2 | Nocturnal polyuria (NP)[3–5]

2002: Nocturnal urine volume output greater than 20% of the daily total urine output in the young and 33% in the elderly, with the value for middle age probably falling somewhere in the middle. Increased proportion of a 24-h urine output occurring at night (normally during the 8 h while the patient is in bed).[12]

2010: Excess (over 20–30%—age dependent) proportion (nocturnal voided volume/total 24 h voided volume × 100%) occurs at night (or when patient is sleeping).[14]

2018: Excessive production of urine during the individual's main sleep period. The definition used by the health-care provider to quantify "excessive" will need to be highlighted in both clinical and research settings and should be derived from a bladder diary.

4.3 | Core reasons for change

There have been numerous ways of classifying nocturnal polyuria.[20] From clinical practice, we have learned that the 20% and 33% numbers (the nocturnal polyuria index) are not well supported, as they were not based on normal distributions and were not properly validated. They also assumed that the index person is 70 kg and sleeps 8 h a day, irrespective of gender or age. Regardless of what definition is applied, the diagnosis of NP includes a differential diagnosis encompassing congestive heart failure, diabetes mellitus, obstructive sleep apnea, peripheral edema, excessive night-time fluid intake and "normal" ageing. Other factors which have been implicated in the causation of nocturnal polyuria are an abnormality in nocturnal secretion or action of arginine vasopressin (AVP) (this describes the classical nocturnal polyuria syndrome) and any edema-forming state (in addition to congestive heart failure, chronic renal disease, nephrotic syndrome, hypoalbuminemia, liver failure), co-morbidities such as autonomic nervous system dysfunction, Alzheimer's disease, multisystem atrophy, stroke, and Parkinsonism. Hence the need for standardization!

Terms that can be used to define urine production at night include:

1. 24-h urine production rate (mLs/h): volume of urine produced per hour in a 24 h period.
2. nocturnal urine production rate (mLs/h): nocturnal urine volume/length of time of main sleep period (mLs/h).
3. nocturnal urine production rate index: nocturnal urine production rate/24-h urine production rate.

Absolute and normal values are yet to be defined for the above terms, but will be dependent on fluid input, the population defined, and the gender. There are several definitions in the literature that could be used to indicate nocturnal polyuria[f] including:

1. Nocturnal urine production based on body weight of greater than 10 mLs/kg.[21]
2. Rate of nocturnal urine production >90 mLs/h.[22] This figure is suggestive of nocturnal polyuria in *men* only (about 450 mLs per 8 h sleep).[23] There are no studies looking at the rate of nocturnal urine production in women and this may well be different from that in men.
3. Nocturnal polyuria index is the most commonly used definition for nocturnal polyuria[20] (nocturnal urine volume/24-h voided volume)[1] based on nocturnal urine volume as part of total 24-h urine volume. It is age dependent; however the age groups have not been clearly defined:
   a. 33% in elderly, for example, >65.
   b. >20% in younger individuals.
   c. 20–33% in "middle age."
4. Nocturia index (nocturnal urine volume/maximum voided volume).[24]
   a. >1: nocturia occurs because maximum voided volume is smaller than nocturnal urine volume.
   b. >1.5: nocturia secondary to nocturnal urine overproduction in excess of maximum bladder capacity, that is, nocturnal polyuria.

One confounding issue is that if one uses an amount or volume as the indicator for nocturnal polyuria, then even with a normal distribution of day and night output, virtually all people with 24-h polyuria will have nocturnal polyuria. If one uses a percentage of total 24-h urine output, and if the normal circadian rhythm is preserved, they will not all have nocturnal polyuria. Whatever definition is used, it has to be clearly indicated in both clinical practice and research settings (Figure 3).

4.4 | Enuresis

2002: Not defined as a sign in previous terminology documents.

2010: Not defined as a sign in previous terminology documents.

Daytime		Night-time	
Time	Voided volume (mL)	Time	Voided volume (mL)
Time of waking up: 07.00	200	Time of falling asleep: 22.30	
08.15	175	23.00	150
12.00	375	01.00	275
16.30	325	03.00	400
18.30	225	06.00	350
22.00	225	Woke up at 08.30 next morning and voided 200 mL	

- Maximum voided volume: 400 mL
- Daytime frequency: 6 times (200, 175, 375, 325, 225, 225)
- Nocturia episodes: 4 times (150, 275, 400, 350)
- 24-hour urine volume: 175+375+325+225+225+150+275+400+350+200=2700
- Nocturnal urine volume: 150+275+400+350+200=1375
- NPI: 1375/2700 = 50.9% i.e. nocturia due to nocturnal polyuria
- Ni: (150+275+400+350+200)/400 = 3.4 i.e. nocturia due to nocturnal polyuria
- NBCi (Actual nightly voids (ANV) minus Predicted nightly voids (PNV = Ni-1) (24): 3-(3.4-1) = 0.6 i.e. nocturia is probably *not* due to reduced bladder capacity.
- 24-hr urine production rate (mLs/hr) = 2700/24 = 112.5 mLs/hr
- Nocturnal urine production rate (mLs/hr) = 1375/10 =137.5 mLs/hr
- Nocturnal urine production rate index = 137.5/112.5 = 1.22

FIGURE 3 Example of Nocturnal Polyuria using a one-day bladder diary[c]

2018: Intermittent incontinence ("wetting") that occurs during periods of sleep (while asleep).

NB. As in the symptoms section previously, this occurs while the patient is asleep and has not been woken up from sleep and then leaks. If it occurs during the main sleep period then it could be preceded by the adjective "nocturnal."

4.5 | Core reasons for change

Previous definitions were not available for enuresis as a sign. Enuresis as a symptom has been defined as a complaint of intermittent incontinence that occurs during periods of sleep. As a sign, enuresis could be related to or be a manifestation of several different pathologies that the healthcare provider

would need to investigate, for example, high pressure urinary retention, overactive bladder, or neurogenic causes. Depending on the severity, it could be "wetting" the underclothes, outer clothes, or the bed.

4.6 | Nocturnal urine volume

2002: The total volume of urine passed during the night, including the first morning void.[1]

2010: Cumulative urine volume from voids after going to bed with the intention of sleeping to include the first void at the time of waking with the intention of rising (excludes last void before sleep).[14]

2018: Total volume of urine produced during the individual's main sleep period, including the first void after the main sleep period.

Volume measurement begins after the last void preceding sleep and concludes after the first morning void. The first morning void follows the individual's decision they will no longer attempt to sleep.

4.7 | Core reasons for change

Wording of previous definitions has been confusing. The new definition is practical and takes into account the fact that if an individual does not empty his/her bladder before falling asleep, then for pragmatic reasons it would be reasonable to include any volume produced after the last void before falling asleep as part of nocturnal urine produced. Alternatively, it would be best to advise individuals who are filling out a bladder diary or frequency/volume chart to void before going to sleep to make assessment of volumes passed easier by the healthcare provider when analyzing the diary or chart.

4.8 | 24-h voided volume

2002: Total volume of urine voided during a 24 h period (1st void to be discarded; 24 h begin at the time of the next void).[1]

2010: Summation of all urine volumes voided in 24 h.[14]

2018: Total volume of urine passed during a 24-h period excluding the first morning void of the period. The first void after rising is discarded and the 24-h period begins at the time of the next void and is completed by including the first void, after rising, the following day.

4.9 | Core reasons for change

Previous definitions needed further clarification to avoid confusion with regard to when the 24-h period begins and when it ends. The new definition clarifies this matter.

4.10 | 24-h polyuria

2002: 24-h urine output >40 mL/kg, in men and women, causing daytime urinary frequency and nocturia occasioned by a general increase in urine output, outstripping even normal bladder capacity.[1]

2010: Excessive excretion of urine resulting in profuse and frequent micturition. It has been defined as over 40 mL/kg body weight during 24 h or 2.8 L urine for an individual weighing 70 kg.[14]

2018: The previous definitions have not been changed.

4.11 | Core reasons for change

Since there was no new research or information on defining polyuria, the working group has decided to retain the previous definitions as volumes passed daily vary considerably, and are influenced by environmental, physiological, and pathological factors; which can affect the amount of fluid loss by other means, such as perspiration, and the amount of fluid intake.

5 | CONCLUSION

This standardization document on nocturia and nocturnal lower urinary tract function aimed to update previous standardization documents with emphasis on pragmatism and practicality when coming up with new definitions. These new definitions can be used both clinically and in research, allowing better communication and understanding between healthcare providers and researchers.

This document has involved 16 rounds of full review by co-authors of an initial draft (Version 1) completed on 3 October, 2014. Comments for each round of review were collated and debated as necessary in order to form a subsequent version. Live meetings on the document took place at the ICS annual meetings in Brazil (2014) and Tokyo (2016). The document was then sent to six experts for comments before the final version was produced. The document was also subject to general ICS membership review and reviews by the SSC and ICS Board.

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ENDNOTES

[a] The first nocturia episode must be preceded by sleep. Subsequent nocturia episodes must be followed by the intention of getting back to sleep. The quality of life impact of nocturia is not an element in its definition but will be appropriately evaluated during its assessment by fully validated quality of life questionnaires.

[b] Definition of nocturia does not take into account whether this is bothersome or not, whether it is affecting quality of life or whether it needs treatment. The aim is to have a global pragmatic definition, rather than defining or suggesting a clinical pathological entity. For the healthcare provider, it is prudent that they state the cause of nocturia when reporting it clinically or for research purposes for each individual, in other words it has to be reported why the nocturia occurred, for example, due to urgency, pain, habit, etc.

[c] A 3-day bladder diary is the standard of care for the assessment of patients with lower urinary tract symptoms including nocturia and nocturnal polyuria.

[d] Enuresis can be primary (has been present lifelong) or acquired (developed in adults).

[e] The frequency with which a person passes urine during their main sleep period can be used as an indicator of the severity of their nocturia. It is known that this does not necessarily correspond with the quality of life impact of nocturia. The first void after the main sleep period follows the individual's decision that they will no longer attempt to sleep.

[f] The working group recognizes the limitations and difficulties that exist in defining nocturnal polyuria. It believes that there is not enough data in the literature to make a recommendation to adopt a new definition of nocturnal polyuria as a "sign" or to recommend one method of calculation over the other. Further research is needed into this field before adopting one of the methods of calculation as every definition above has limitations. However, the working group believes that the way forward for new research is to have an absolute number based on rate of urine production during the main sleep period or when the patient has gone to sleep, relative to the urine production rate in 24 h, for the various age groups and both genders. Ultimately, the definition will be used to aid treatment of a bothersome condition and the treatment will target the cause rather than the definition. The definition should also be easily usable in research. Whichever definition is used, the healthcare provider or researcher should specify exactly which parameter and method of calculation they have used to diagnose nocturnal polyuria.

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