

**DEFINITION:** number of times an individual passes urine during their main sleep period. Having woken to pass urine for the first time, each urination must be followed by sleep or the intention to sleep (ICS, 2018). Nocturia is present in both genders and its prevalence increases with age.

## CLASSIFICATION:

**NOCTURNAL POLYURIA (NP):** Excessive production of urine during the individual's main sleep period.

- **Rate of nocturnal urine production:** > 90 mL/h, used in men.

- **Nocturnal polyuria index: nocturnal urine volume/24-h voided volume:** elderly > 65 yr: 33%, young population > 20%

**LOW NOCTURNAL BLADDER CAPACITY (LNBC):** bladder capacity < 200-300 ml.

**GLOBAL POLYURIA (GP):** 24-hour urine volume > 40 mL/kg, representing excessive urine production during day and night

**MIXED ETIOLOGY:** NP, GP and LNBC aren't exclusive and frequently coexist in patients with nocturia. The mismatch between production and storage is explicitly reflected in the nocturia index based on the voiding diary.

\* **Main sleep period:** the period from the time of falling asleep to the time of intending to rise for the next day.

\* **Nocturnal urine volume:** total volume of urine produced during the individual's main sleep period including the first void after the main sleep period.

\* **24-h voided volumen:** volume of urine passed during a 24-h period excluding the first morning void of the period and is completed by including the first void of the following day.

**ETIOLOGY:** Nocturia is a urinary symptom with an etiology that is not necessarily urogenital, and is generally multifactorial.

- **Sleep medicine:** insomnia, restless legs syndrome and periodic limb movements of sleep, parasomnias, obstructive sleep apnoea
- **Cardiovascular:** hypertension, heart failure
- **Renal:** chronic kidney disease
- **Endocrine:** diabetes mellitus, diabetes insipidus, overactive or underactive thyroid, pregnancy, menopause, testosterone deficiency
- **Neurology:** all neurological diseases can potentially cause nocturia, e.g multiple sclerosis, Parkinson's disease, stroke, spinal cord injury
- **Urology:** overactive bladder, bladder outlet obstruction, detrusor underactivity; most associated with LNBC
- **Other conditions:** xerostomia (may prompt increased fluid intake), alcohol and caffeine
- **Medication:** diuretics, calcium channel blockers, lithium, NSAIDs, and drugs that can cause xerostomia

## DIAGNOSIS:

- **Exhaustive clinical history** and identification of comorbidities related to nocturia, including **drug intake**.
- **Validated Questionnaires:** characterize the nature of the symptoms. **TANGO Short Form** (22 statements across 4 domains: Cardio/Metabolic, Sleep, Urinary Tract and Wellbeing)
- **Bladder diary:** the **ICIQ** bladder diary is suitable, as it is the only validated
- **Investigations:** electrolytes, renal and thyroid function, calcium, HbA1c, urine dipstick, pregnancy test (where applicable)

**Use a 24-72 hour voiding diary.** Nighttime voiding diaries are an alternative option if GP has been ruled out, but they have low specificity for detecting LNBC.

If an **associated or isolated urologic etiology** is identified, guide secondary evaluation with urologic ultrasound, uroflowmetry, postvoid residual measurement, and lower urinary tract symptom (LUTS) Questionnaires. **Refer to specialists based on suspected etiology.**

**TREATMENT:** the underlying medical condition is prioritized over nocturia. Before any treatment, general measures are recommended, followed by pharmacological and sometimes surgical management.

### 1. GENERAL MEASURES

- Minimize fluid intake at least 2 hours before bed
- Empty your bladder before sleep
- Increase exercise levels and improve fitness
- Reduce salt intake
- Weight loss in overweight or obese patients
- Elevation of lower limbs a few hours before going to bed
- Adjust the intake of diuretics according to the half-life of the drug
- Consider Home Modifications for elderly population.

### 3. TRANSURETHRAL RESECTION OF THE PROSTATE

Patients with prostate enlargement and LUTS with more beneficial effect are: those with higher symptom scores, age <74 yr, Qmax <9.8 ml/s, bladder outlet obstruction index >47.6, and bladder contractility index >123.0 (UPSTREAM)

### 2. MEDICAL THERAPY: UROLOGICAL ETIOLOGY

**α-Blockers, 5-α reductase inhibitors, antimuscarinics, and β-3 agonists,** although supported by scientific evidence, have modest clinical effects on nocturia. **Use the first in patients with LUTS, the second in men with prostate volume > 40ml and the last two in patients with overactive bladder.**

#### ANTIDIURETIC THERAPY: DESMOPRESSIN

**Indications:** NP and nocturia > 2 episodes

**Contraindications:** hyponatremia and von Willebrand disease

**Presentation:** sublingual. Nasal spray is not approved in Europe

**Dosage:** 0,1 – 0,4mg/day; start with lower dose in > 65 years and women

**Recommendations:** avoid drinking fluids 1 hour before and 8 hours after

**Caution:** monitor hyponatremia especially in women, CKD, > 75 years

**Follow-up:** Na+ at baseline, after baseline (day 3, day 7, and 1 month), after titration, and periodically during treatment

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