

Nocturnal enuresis (NE) is defined as an intermittent incontinence of urine or bedwetting while sleeping regardless of the presence or absence of concomitant daytime symptoms. There are multifactorial etiologies, encompassing psychological and physiological aspects of the disorder. The most common underlying pathophysiological mechanisms of NE include nocturnal polyuria, decreased bladder capacity (BC), detrusor overactivity, associated sleep arousal disturbances, global maturation delay, and genetics. NE, most likely, is a disorder caused by a combination of these etiologies in a multifactor manner.

Electrical stimulation

Despite the growing body of neuroimaging data and the emergence of models of NE, there is a lack of targeted treatment interventions. Almost many years ago, promising results were obtained by maximal electrical stimulation in enurectic children [\[1\]](#), [\[2\]](#). Or there have been reported reduced symptoms following treatment of NE with transcutaneous parasacral electric nerve stimulation [\[3\]](#).

rPMS

More recently, magnetic stimulation has been proposed as a potential method for stimulation of the sacral nerves (not pelvic floor) [\[4\]](#), [\[5\]](#). Because it generates an electrical field resulting similar to that produced by conventional electrical stimulators - with the advantage of greater depth range with little discomfort at the point of application. This has already been proven by functional magnetic stimulation. However children wore the stimulator day and night for 2 months [\[6\]](#). Results: the number of weekly NE episodes decreased significantly compared to the placebo (completely dry or significantly improved). Also, an increase in bladder volume at the first desire to void was observed.

According to a recent study 44 NE-patients were randomized to receive either sham or real repetitive sacral root magnetic stimulation (15 Hz / 10 sessions). Results: the mean number of wet nights/week was significantly reduced in patients with the verum device. This improvement was maintained 1 month after the end of the treatment. They also reported an improvement in VAS ratings and quality of life [\[7\]](#).

The only question is how to provide a convenient lumbosacral treatment by a Pelvicenter device.

Recommended frequency:

15 - 18 Hz / 10 - 16 sessions

Minimum age:

In studies mentioned, mean age (SD) was 10,8 years, range **6 - 14 years** or 13.6 (3.3) years ranging from 8–25 years as an inclusion criteria. But TMS (transcranial magnetic stimulation) safety guidelines concluded that single-pulse and paired-pulse TMS **is safe** for children **aged 2 years** and older, although there are few studies of peripheral magnetic stimulation conducted in children [\[8\]](#). **Another decision guidance:** The developmental profile of central conduction times to upper and lower extremity muscles showed an age-dependent acceleration with adult values not being reached before the age of about 10 years. **In contrast**, peripheral conduction times obtained after cervical or **lumbar root stimulation** to upper and lower extremities showed a

much faster maturational profile, with adult values being reached at about the **age of 3 years** ^[9]. Consequently, minimum age could be **3 years**.

References

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