



## Management of female stress urinary incontinence: A care pathway and update



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### ABSTRACT

Stress urinary incontinence (SUI) is a condition characterized by an involuntary loss of urine occurring as result of an increase in intra-abdominal pressure due to effort or exertion or on sneezing or coughing. Estimates of its prevalence in the female population range from 10% to 40%.

A literature search of the Medline, Cochrane library, EMBASE, NLH, ClinicalTrials.gov and Google Scholar databases was done up to July 2017, restricted to English-language articles, using terms related to SUI, medical therapy, surgical therapy and treatment options. The search terms included female stress urinary incontinence, mid-urethral sling, tension-free vaginal tape (TVT) and transobturator tape (TOT, TVT-O). Original articles, reviews and meta-analyses were included.

Surgical therapy should be considered only after conservative therapies (e.g. an exercise programme or topical estrogens) have failed. Synthetic mid-urethral slings are the gold standard for the surgical treatment of SUI according to the 2016 guidelines of the European Society of Urology (ESU) and the 2017 position statement of the European Urogynaecological Association (EUA).

The therapeutic options are numerous but further research into new therapeutic strategies is needed to achieve a better balance between efficacy and adverse events.

### 1. Introduction

Urinary incontinence is defined as a condition of involuntary loss of urine [1]. The three most common types are: (1) stress urinary incontinence (SUI), characterized by an inadvertent loss of urine occurring as a result of an increase in intra-abdominal pressure due to effort or exertion or on sneezing or coughing; (2) urge urinary incontinence (UUI), denoting involuntary leakage arising for no apparent reason and associated with urgency; (3) mixed urinary incontinence (MUI), denoting the combination of both SUI and UUI.

SUI has a negative impact on social and working life and is associated with poor mental health [2]. According to Hunskar et al. [2] the prevalence of each type of urinary incontinence in noninstitutionalized women is 49%, 21% and 29%, respectively. Other estimates of the prevalence of SUI range between 10% and 40% of the post-menopausal female population. The reported rate depends on the definition used (e.g. whether the involuntary loss of urine occurs several times in a day or in a week, or whether the last 12 months is specified), on the survey

methodology (e.g. telephone interviews or postal questionnaires) and on differences between study populations (e.g. country of residence).

The objective of this review is to report the state of the art in the management of female stress urinary incontinence.

### 2. Search strategy

A detailed literature search of the Medline, Cochrane library, EMBASE, NLH, ClinicalTrials.gov and Google Scholar databases was done up to July 2017, restricted to English-language articles, using terms related to SUI, medical therapy, surgical therapy and treatment options. The search terms included female stress urinary incontinence, mid-urethral sling, tension-free vaginal tape (TVT) and transobturator tape (TOT, TVT-O). Original articles, reviews and meta-analyses were included. Studies exclusively of devices no longer available on the market were excluded. Three of the authors (GC, MM and SM) selected the studies independently on the basis of the inclusion criteria. Disagreements among authors over the studies to include were resolved

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by discussion. In cases of duplication, the study with the most recent data was included. For cohort studies with multiple publications, the latest dataset on efficacy was used.

### 3. Pathogenesis of SUI

Urinary continence depends on a synergy between the structures that constitute the pelvic floor, the sympathetic and parasympathetic nervous systems, and the motor fibres of the pudendal nerves. An alteration in one or more components can lead to an inability of the urethra to counteract increases in abdominal pressure, even minimal increases in the most severe cases. Consequently, involuntary loss of urine can occur during physical exercise, for example.

Factors that predispose to SUI are age, parity (especially with vaginal delivery) and obesity, as they are associated with a weakening of the pelvic floor support structures, resulting in urethral hypermobility. Parity can further predispose to SUI through its effects on bladder and urethral innervation, resulting from the stretching or compression of nerves during the passage of the fetus through the birth canal [3,4].

### 4. Conservative treatment of SUI

Fig. 1 shows the initial management of urinary incontinence in women and Fig. 2 the specialized management as recommended by the European Association of Urology (EAU) in its guidelines [5]. The main options include exercises aimed at restoring the strength and muscle tone of the pelvic floor, and estrogenic therapy. An intervention that has proven to be effective as a first therapeutic step is triple therapy with vaginal *Lactobacilli acidophilus* and estriol plus pelvic floor exercises [6]. Fig. 3 shows the care pathway for women with SUI.

#### 4.1. Drugs for SUI (duloxetine)

Duloxetine has been approved in Europe for the treatment of SUI. Its adverse effects include mental health problems and suicidality. Duloxetine has been shown to be effective for SUI in women but the associated harms are reported to outweigh the benefits [7].

Furthermore, the UK National Institute for Health and Care Excellence recommends that duloxetine should not be used as a first-line treatment or routinely offered as a second-line treatment for stress

urinary incontinence, given that pelvic floor muscle training is more effective and less costly than duloxetine and that surgery is more cost-effective than duloxetine [8].

#### 4.2. Laser therapy

Laser therapy has been introduced as a non-invasive treatment of SUI. It is also used for the treatment of vaginal disorders associated with menopause, notably vaginal atrophy. The lasers used in gynaecology are mainly of two types, the CO<sub>2</sub> laser and the vaginal erbium ER:YAG laser (VEL) (so-called because it uses an erbium yttrium-aluminium-garnet medium). The latter, although it lacks the microablative function of CO<sub>2</sub> lasers, can induce changes in genital tissues that counter vaginal dryness and dyspareunia. It has been used in the treatment of mild and moderate SUI, with a significant reduction in self-reported symptoms [9–12].

The mechanism of action is attributed to the remodelling which occurs due to a thermogenic effect on the collagen that constitutes the pelvic floor; with menopause, a drastic reduction in the production of collagen occurs, thus resulting in a decrease in its physiological function of support, causing not only urinary incontinence but also the onset or aggravation of prolapse of the genital organs. The thermogenic effect induces in the target tissues a neoangiogenesis, neof ormation of collagen; it also increases epithelial thickness and the cellular glycogen content. This ensures greater support for the urethra. All these tissue changes are detectable for at least six months after treatment [10].

The first studies of laser therapy in the treatment of SUI were done by Fistončić's research group [11]. They used the Incontinence Questionnaire—Urinary Incontinence Short Form (ICIQ-iu SF) to evaluate the efficacy and safety of the ER:YAG laser and found that even in severe SUI there was a significant improvement in symptoms, without any particular adverse events being recorded. The efficacy of the treatment is apparent after a single session, but increases with three sessions, and the benefits last for at least six months [11].

Although there not enough studies that have investigated the long-term efficacy of laser therapy, it appears clear that it does represent a therapeutic option, as it is minimally invasive and objective benefits have been demonstrated, with regard not only to SUI but to the whole spectrum of symptoms of the genitourinary syndrome of menopause (GSM).

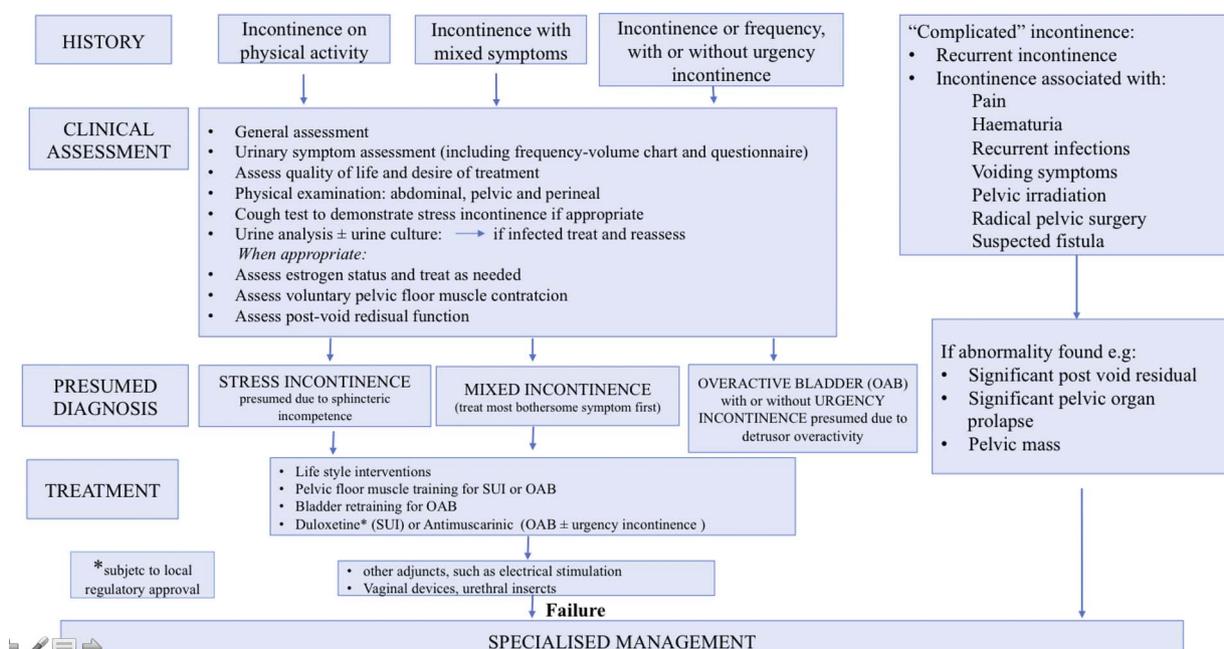


Fig. 1. Initial management of urinary incontinence in women [5].

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