



FOGSI - ICOG

Good Clinical Practice Recommendations

GCPR

Modern Management of Urinary Incontinence



Convenor – JB Sharma Co-Convenor – Amita Jain
Mentors – Hrishikesh D Pai, Madhuri Patel, Laxmi Shrikhande
Advisors – Sanjay Gupte, Hema Divakar
National Co-ordinators – CN Purandare, Rishma Dhillon Pai,
Nandita Palshetkar, Jaydeep Tank
Co-ordinator – Surekha Tayade

Urogynaecology Committee

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DISCLAIMER

These recommendations for “Modern Management of Urinary Incontinence” have been developed, to be of assistance to obstetricians, gynecologists, consulting physicians and general practitioners by providing guidance and recommendations for managing women with urinary incontinence. The recommendations included here should not be viewed as being exclusive of other concepts or as covering all legitimate strategies. The suggestions made here are not meant to dictate how a particular patient should be treated because they neither set a standard of care nor do they guarantee a particular result. To diagnose patients, choose dosages, and provide the best care possible while also taking the necessary safety precautions, clinicians must rely on their own experience and knowledge. The writers or contributors disclaim all responsibility for any harm and/or damage to people or property resulting from the use or operation of any techniques, goods, guidelines, or ideas presented in this content.

INTRODUCTION

Urinary incontinence (UI), defined as any complaint of the involuntary loss of urine.¹ The overall prevalence of UI in Indian community ranges from 10% to 30% as per studies conducted on different populations till date.²⁻⁵ A statistical significant relation was seen between the presence of UI and age, marital status, parity, past history of abortion, and occurrence of urinary tract infection (UTI) in last year. It was observed that only 7% of the total women suffering from UI had consulted doctor for their problem.⁵

Urinary incontinence can be transient or chronic. Transient UI arises suddenly, lasts less than 6 months, and can be reversed if the underlying cause is addressed. Chronic UI is differentiated into stress, urge, mixed, overflow, or functional subtypes. Stress UI results from urethral sphincter weakness or urethral hypermobility leading to the leakage of urine during activities with increase in intraabdominal pressure (e.g., exercising, sneezing, and laughing); while urge UI is caused by detrusor overactivity resulting in the involuntary loss of urine associated with urgency, frequency and/or nocturia. Patients typically lose urine on the way to the toilet and suffer from sleep disturbance. Overflow UI occurs because of detrusor underactivity or bladder outlet obstruction, which leads to urinary retention and subsequent leakage. Patients may strain to pass urine or have a sensation of incomplete emptying. Functional UI occurs when there are barriers to toileting, such as cognitive impairment, physical frailty, or immobility.⁶ The distribution of the prevalence of these different types was 32.16% for stress UI, 23.78% for urge UI, and 44.06% for mixed incontinence in one of the latest studies from India.^{2,5}

It is important to understand that leakage is not a normal part of aging and that treatments are available to reduce or eliminate the problem. This Good Clinical Practice Recommendations (GCPR) includes all latest treatments for the two main types of incontinence in women, stress UI and urge UI; with special cautions and instructions for a combination of urge and stress UI, called mixed UI.

CONSERVATIVE MANAGEMENT

Conservative treatment is now considered the first-line treatment option for UI. The conservative treatment modalities are divided into three broad categories:

- A. Simple clinical interventions
- B. Lifestyle modifications
- C. Behavioral and physical therapies.

Simple Clinical Interventions

Practice statement:

Treatment of comorbid conditions, such as obesity, diabetes mellitus, depression, anxiety, renal disease, hypertension, sleep disturbances, etc., may cause the improvement of UI symptoms	LE1, Grade A
Dose adjustments and review of other ongoing medications which may impact urine formation, bladder contractility or cognition may also lead to improvement in UI	LE3, Grade C
Treating coexisting constipation also improves UI symptoms	LE3, Grade C

Discussion:

- It is very important to enquire and enlist all the comorbid conditions in women suffering from UI irrespective of their age. Conditions, such as obesity, diabetes mellitus, depression, anxiety, renal disease, hypertension, sleep disturbances, etc., can cause the worsening of UI. It is possible that the appropriate treatment of the underlying comorbid condition may cause the improvement of urinary symptoms.⁷
- A thorough drug history should be taken in all women with UI, more so in elderly, as they are exposed to a number of medications (polypharmacy). Drugs which may impact urine formation like diuretics, bladder contractility like antidepressants or cognition like sedatives, and antiallergic, should be reviewed, as they may lead to improvement in urinary symptoms.⁸
- Gastrointestinal disorders, such as constipation, can contribute to the development of lower urinary tract symptoms, including overactive bladder (OAB) symptoms and worsening of stress UI. The initial approach should include measures to relieve coexisting constipation, which may help in reducing urinary symptoms.⁹

Lifestyle Modifications*Practice statement:*

- An overall reduction in fluid intake by 25% may improve OAB symptoms but not UI (LE3, Grade C)
- Reducing bladder irritants, such as caffeine, may improve OAB symptoms but not UI (LE1, Grade A)
- Cessation of smoking is associated with the reduction of urgency, frequency, and UI (LE1, Grade A)
- Nonsurgical and surgical weight loss have shown only short-term improvement in UI (LE1, Grade A)

Discussion:

- Modification of fluid intake should be advised by the healthcare professionals based on the patient's 24-hours bladder diary (intake/output and frequency/volume charts) but benefit is seen in improving mainly the symptoms of OAB.¹⁰
- Also, many other drinks, such as caffeine, colas, and tea, and food items, such as spices, etc., and smoking can cause bladder irritation, causing the worsening of urgency and frequency symptoms. Reduction in the consumption of these items can cause improvement in OAB symptoms but not in UI.^{11,12}
- Moderate decrease in the episodes of urge UI/week and 15–18% improvement in the prevalence of stress UI have been seen after 5–10% weight loss; but these benefits may diminish over time. Therefore, no recommendations can be made to support weight loss regimens for a long-term improvement of UI. The modest and short-term improvement in UI after weight loss means that we should not delay care for women with urinary symptoms if they are not interested in weight loss regimens.^{11,13,14}

Behavioral and Physical Therapies*Practice statement:*

Bladder training alone or in combination with antimuscarinics (AMAs) leads to improvement in frequency and nocturia	LE1, Grade A
Prompted voiding is recommended for elderly and care dependent people with cognitive issues	LE1, Grade A
Supervised intensive pelvic floor muscle training (PFMT) with or without biofeedback is beneficial for curing or improving UI	LE1, Grade A
PFMT with electrical stimulation (ES) may improve urge UI, but not stress UI	LE1, Grade A
Vaginal cones are beneficial for curing or improving surge UI	LE1, Grade A
There is lack of evidence to ascertain the role of Yoga but recent evidences favor role of electroacupuncture (EA) in the improvement of UI	LE1, Grade A

Discussion:

- Bladder training is better than no treatment in women with mixed UI or urge UI. When compared to antimuscarinics, drug treatment leads to more improvement. However, when bladder training is used in combination with AMAs, it leads to greater improvement in frequency and nocturia.¹⁵⁻¹⁷

- Prompted voiding, either alone or as a part of a behavioral modification programme, has been shown to improve continence in elderly, and care-dependent people with cognitive issues.^{18,19}
- There was moderate or high certainty evidence that PFMT with or without biofeedback was more beneficial than control for curing or improving UI. PFMT with more individual health professional supervision was more effective than less contact/supervision and more intensive PFMT was more beneficial than less intensive PFMT. There was a moderate certainty evidence of the improved quality of life with PFMT compared to control. There was a moderate or high certainty evidence of better cure or improvement for PFMT with bladder training than bladder training alone.²⁰
- No evidence to conclusively say that PFMT with ES shows more improvement than PFMT alone in women with surge UI. In women with urge UI, ES plus PFMT resulted in better cure or improvement and a higher quality of life than PFMT alone.
- Vaginal cones were more beneficial than control for curing or improving surge UI.²⁰
- Due to lack of evidence, there is uncertainty whether yoga is useful for women with UI.²¹
- Compared with AMAs plus PFMT, EA resulted in significantly less pad weight on the 1-hour pad test and statistically significantly lower severity scores on the International Consultation on Incontinence Questionnaire Short Form (ICIQ-SF). Trial sequential analysis used to assess the stability of the results proved that the test was stable and the evidence was conclusive.²²

Pharmacotherapy for Urge UI

Practice statement:

Offer either mirabegron or anticholinergic as the first-line pharmacotherapy in women with urge UI	LE1, Grade A
Prefer long-acting/sustained release agent for better compliance and limiting adverse effect profile	LE1, Grade A
Patients requiring dose escalation for improvement in efficacy, consider the combination of mirabegron with anticholinergic as an alternative to the dose escalation of either agent	LE1, Grade A
Consider flavoxate for the alleviation of symptoms for short-term as an alternative in view of lower side-effect profile. Long-term compliance is likely to be low in view of thrice daily dosage	LE3, Grade C
Consider vaginal estrogen application in association with systemic pharmacotherapy in postmenopausal women (for genitourinary syndrome of menopause; not specific for OAB)	LE1, Grade C
Caution should be exercised in using anticholinergics in women with other comorbidity medications having anticholinergic effects	LE2, Grade B

Discussion:

- Antimuscarinics and beta-3 agonists are the mainstay of pharmacotherapy.²³
- Several antimuscarinics are available for clinical use across the globe with different availability patterns in different countries. Most studied molecules are oxybutynin, tolterodine, solifenacin, darifenacin, trospium, flavoxate, propantheline, propiverine, fesoterodine, and imidafenacin. Except for last three, all others are available in India. These differ in their muscarinic receptor affinity (selective vs. nonselective), additional modes of action (e.g. calcium channel blockage, local anesthetic), lipid solubility, half-life, and metabolism. The mechanism of action of flavoxate is not well understood.
- Mirabegron and vibegron are beta-3 blockers; only mirabegron is available in India.
- Apart from propantheline and flavoxate, the level 1 evidence of efficacy is available for antimuscarinics and beta-3 blockers. Based on two-drug meta-analyses as well as network meta-analyses evaluating multiple inter-drug comparisons, most anticholinergics and beta-3 agonists have been found equivalent in efficacy in terms of reduction in day and night frequency, urgency episode, and urge incontinence episodes. Although not conclusive, there is some evidence that solifenacin and fesoterodine are superior to tolterodine for the relief of UI.²⁴
- Flavoxate is a commonly prescribed direct smooth muscle relaxant and local anesthetic and has been in practice for several decades. Although contemporary level I evidence is lacking, a meta-analysis of small studies shows significant efficacy, equivalent to oxybutynin with safer adverse effect profile.²⁵
- Common adverse effects of anticholinergics are constipation, dry mouth, cognitive dysfunction, and headache which lead to discontinuation in a small percentage of patients. These adverse effects are significantly higher than

that of placebo, except for cognitive dysfunction. The common adverse effects of beta-3 agonists are hypertension, constipation, dry mouth, and dyspepsia. However, the incidence of these is not higher than placebo.²³

- Dose escalation of anticholinergics and beta-3 agonists leads to superior efficacy, however, at the cost of high adverse effect profile. Level 1 evidence suggests beta-3 agonist-anticholinergic combination provides similar efficacy (compared to dose escalation of either agent) without increasing the adverse effects improving tolerance.²⁶
- Apart from oxybutynin, none of modern anticholinergics (lipophilic and lipophobic alike) have been found to be associated with cognitive dysfunction in the elderly women.²⁷ However, the elderly women are likely to be on polypharmacy, some of which would have anticholinergic action (e.g. H I blockers, tricyclic antidepressants, antiparkinsonism medications, and antipsychotics). Cumulative effect on cognition should be considered before starting anticholinergic bladder sedatives in such patients.
- In women who have gone through the menopause, low estrogen levels may contribute to UI. A review of 34 trials found that significantly more women who received local (vaginal) estrogen for incontinence reported that their symptoms improved compared to placebo. Conversely, systemic estrogens worsened urinary symptoms including incontinence.²⁸

SURGICAL TREATMENT FOR URGE UI

Practice statement:

Offer intradetrusor injection of 100 units of onabotulinum toxin A to women with refractory urgency incontinence	LE1, Grade A
Counsel the patient regarding the temporary effect of onabotulinum toxin A, need for repeated injections for continuing efficacy and the possibility of need for clean intermittent self-catheterization	LE2, Grade A
Offer sacral neuromodulation to women with refractory urgency incontinence who have failed or as an alternative to onabotulinum toxin	LE1, Grade A
Counsel the patient regarding significant risk for adverse effects including the need for reoperation in about a third of patients undergoing sacral neuromodulation	LE2, Grade A
Do not offer intravaginal laser primarily for the treatment of UI	LE3, Grade A
Offer augmentation cystoplasty as a last resort for UI, having failed all the above options	LE3, Grade C

Discussion:

- Based on randomized placebo-controlled and dose-ranging studies, intradetrusor injection of 100 units of onabotulinum toxin A is the recommended initial dose for the interventional treatment of refractory overactive bladder.²⁹ Studies have found significant reduction in frequency, UI episodes, and improvement in the overall quality of life. There is 5% incidence of the retention of urine requiring clean intermittent catheterization. Patients must be counseled about this preoperatively. The demonstration of detrusor overactivity does not seem to affect efficacy in patients with UI.³⁰ Studies have examined the role of repeated injections and found that efficacy is maintained. Based on level III data on small studies with the heterogeneous group of patients, 'tolerance' did not develop up to 5 injections spaced 6 to 11 months apart. However, for a small number of participants receiving 6th or 7th injection, the space is decreased to 5 months or so.^{31,32}
- Sacral neuromodulation is the only therapy which affects the neurophysiology of overactive bladder. It entails low-level electrical stimulation of S3 nerve root which 'modulates' the primary and secondary lower urinary tract reflexes. It is a well-established treatment option for refractory overactive bladder. Even in the absence of placebo-controlled trials (which are obviously not possible), studies with immediate vs. deferred treatment and those comparing sacral nerve stimulation (SNS) with botulinum toxin A have confirmed its efficacy.³³ It is much more expensive than onabotulinum toxin A in short to medium term in view of very high initial costs. Adverse events have been reported in up to half of implanted patients, a large majority of whom need surgical intervention.
- Most studies on augmentation cystoplasty have been conducted on patients with small capacity bladder with poor compliance (e.g. tuberculosis, radiation cystitis, neurogenic bladder, chronic inflammation, etc.). There is no high quality data on its efficacy in patients with idiopathic detrusor overactivity. Available data suggests lower efficacy compared to those with neurogenic UI.³⁴

DEVICES FOR SURGE UI

Practice statements:

Mechanical devices can be offered to mild-to-moderate surge UI patients who have failed the adequate periods of conservative management only as a part of a well-structured research trial	LE1, Grade A
Continence pessaries, Uresta, and Impressa are to be used only as a part of a well-structured trial and the complications must be discussed with the patients	LE2, Grade A
Lack of the benefit of one device over the other and information that only short-term results are available must be discussed with the patients	LE1, Grade A

Discussion:

- Common mechanical devices used in the management of surge UI include continence pessaries; Uresta, and Impressa.
- Continence pessaries are placed transvaginally and help in the reduction of surge UI by stabilizing and supporting the urethra, increasing the urethral length, and by a gentle compression of the urethra against the pubic bone during the times of increased intra-abdominal pressure. Serious complications are seen following the long-term usage of pessaries.^{35,36}
- Uresta is a bell-shaped pessary that has a handle at the base for easy insertion and removal. Case series and a small-sized randomized controlled trial (RCT) (Uresta vs Placebo), show that Uresta is effective in reducing surge UI.³⁷⁻³⁹
- Impressa is a disposable single-use tampon-like device, that is designed to prevent the device from moving within the vagina. An open-labeled, controlled study, and an RCT showed that Impressa has been shown to reduce surge UI and the efficacy is like that of a continence pessary, respectively.^{40,41}
- At present, there is very less evidence available to infer whether their use is better than no treatment and also insufficient evidence to favor one particular device over the other or other forms of treatment, so large well-conducted trials are needed.^{42,43}

PHARMACOTHERAPY FOR SURGE UI

Practice statements:

Offer postmenopausal women who suffer from surge UI with the symptoms of vulvovaginal atrophy (VVA), vaginal estrogen therapy	LE1, Grade A
Patients taking systemic estrogen therapy as hormonal replacement therapy paradoxically seem to develop surge UI or experience worsening surge UI. They may be offered other drugs like raloxifene	LE1, Grade B
Duloxetine can be advised in selected surge UI patients (not responding to conservative therapy and who want to avoid invasive therapy) after counseling regarding adverse effects	LE1, Grade C
Dose titration is to be done during the initiation and withdrawal of duloxetine due to the increased risk of adverse effects	LE1, Grade A

Discussion:

- Postmenopausal women receive local estrogen for the treatment of VVA, which is beneficial to them.
- A Cochrane review of estrogen therapy for UI in postmenopausal women was done in which 17 studies focused on women suffering from surge UI and receiving local estrogen. The short-term improvement of surge UI was noted in the review.⁴⁴
- We can give vaginal estrogen therapy as conjugated equine estrogen, estriol, or estradiol in various forms such as vaginal pessaries, creams, or vaginal rings. Studies reveal that women prefer vaginal rings over pessaries.⁴⁵
- Two open-label studies evaluating the effect of duloxetine in surge UI over the long-term had the high rates of drug discontinuation due to adverse events (AEs) such as nausea, vomiting, dry mouth, constipation, insomnia, giddiness, fatigue, and somnolence.^{46,47}
- In a systemic review, it was concluded that there was substantial evidence to support the efficacy, safety, and tolerability of duloxetine in the treatment of surge UI. AEs were mild to moderate and they remitted or decreased with treatment continuation.⁴⁸
- Duloxetine was found to have efficacy for the treatment of UI in women as compared to a placebo, though the risk of AEs was also noted.⁴⁹

SURGICAL TREATMENT FOR SURGE UI

Conventional Surgeries

Practice statements:

Synthetic mid-urethral slings (retropubic and obturator), traditional autologous fascial slings and open colposuspension are the most effective surgical procedures for the treatment of surge UI in women	LE1, Grade A
Retropubic tension-free vaginal tape shows more promising outcome as compared to obturator tape	LE1, Grade A
Retropubic tape is superior to obturator tape in patients with obesity, intrinsic sphincter deficiency (ISD), and pelvic organ prolapse	LE1a, Grade A
Retropubic tape is more efficacious than obturator tape in the long term	LE1, Grade A
The main complication related to obturator tape is leg and groin pain; while for retropubic tape, is bladder perforation	LE1, Grade A
Both techniques of obturator tape (outside in & inside out) are comparable to each other	LE1, Grade A
The cure rate of standard obturator tapes is higher than that of single-incision mini-slings (SIMS)	LE1, Grade A
Adjustable SIMS are comparable to standard obturator tapes in terms of cure rates, with a lower risk of postoperative complications	LE1, Grade A
Autologous transobturator rectos fascial slings are comparable to the standard transobturator tension-free vaginal tapes	LE1, Grade A
Autologous retropubic rectos fascial slings are comparable to the standard transobturator tension-free vaginal tapes, but have more operative complications	LE1, Grade A
Autologous fascia lata slings as compared to the rectos fascia] slings has shown decreased perioperative morbidity without compromising functional outcomes	LE2, Grade B
Open colposuspension is to be preferred for surge UI in patients undergoing concomitant open abdominopelvic procedures	LE1, Grade A
Patients undergoing colposuspension should be informed about the risk of postoperative pelvic organ prolapse (POP) and voiding dysfunction postoperatively	LE1, Grade A
Laparoscopic colposuspension should not be used routinely for surge UI in women	LE1, Grade A
In women who have to undergo a concomitant laparoscopic procedure, laparoscopic colposuspension is to be preferred and should be performed by persons who have undergone appropriate training for it in high-workload centers managing UI in women	LE1, Grade A

Discussion:

- Systematic review and meta-analysis of 75 RCTs that assessed a total of 21,598 women with surge UI concluded that as a surgical option synthetic mid-urethral slings (MUS) both retropubic and obturator, traditional autologous fascia! slings and open colposuspension are the most effective surgical procedures in the armamentarium of the treatment of surge UI in women.^{50,51}
- Retropubic tape may have a better outcome compared to the obturator approach for surge UI.⁵²
- In patients with obesity, ISD, POP and recurrent surge UI after MUS failure, retropubic tape is superior to obturator tape in terms of both objective and subjective cure rates.^{53,54}
- In a multicentric RCT with 12 years of follow-up, the retropubic tape appears to be an effective treatment for the majority of women with surge UI. It appears to be superior to the obturator tape for the long-term cure of surge UI.⁵⁵
- Systematic review and meta-analysis of 22 RCTs comparing retropubic and obturator approach, there was no significant difference regarding the number of incontinence episodes, subjective patient reported effect, and incontinence related quality of life (QoL). The incidence of leg and groin pain was more after obturator tape. Bladder perforations were significantly more common after retropubic approach. In absolute numbers, this meant only 5 more bladder perforations after retropubic tape per 1000 operations.⁵⁶
- As far as various techniques of obturator approach (outside-in versus inside-out) is considered in 10-year follow-up trials both were found to be comparable.⁵⁷
- As the standard obturator tapes provide higher subjective and objective cure rate compared to mini-slings, standard obturator tape should be preferred for patients with surge UI even though with the higher risks of postoperative thigh pain when compared with mini-sling.^{58,59}

- However, pragmatic, noninferiority, randomized trial comparing SIMS with standard mid-urethral slings (retropubic and obturator among women at 21 U.K. hospitals) during 36 months of follow-up found SIMS to be noninferior.⁶⁰
- The subjective and objective effectiveness of adjustable SIMS (still not available in India) was found comparable with conventional obturator tapes. Thus, these adjustable tapes can be used in place of standard obturator tapes with a lower risk of postoperative complications (leg/groin pain; failure/voiding dysfunction).⁶¹ However, to achieve continence with adjustable single-incision mid-urethral tape, it is necessary to use the different lengths of single-incision tape. Inappropriate tape length could cause failure related to the tape itself and not to the technique.⁶²
- *Complications related to MUS:* While retropubic approach confers more of intraoperative risk related to bladder or urethral injury; obturator approach is associated with more of leg/groin pain and vaginal erosion. However, the contemporary evidence regarding complications related to synthetic mesh usage for the treatment of surge UI, is low-level and often contradictory.⁶³ As to conduct a prospective trial to assess complications is unethical and unacceptable, mandatory registries have been suggested to accrue large datasets and accurately record standardized clinical and patient outcomes to generate a robust data resource for analysis.
- *Autologous slings:* After the United States Food and Drug Administration (US-FDA) warnings and controversies that followed, the use of synthetic slings even for surge UI has significantly decreased in many countries and these are no longer available in some countries. This has led to the renaissance of the use of natural autologous fascial sling. Autologous transobturator rectus fascial sling demonstrates comparable efficacy, safety, and feasibility as compared to the transobturator tension-free vaginal tapes for the treatment of surge UI, at 24 month follow-up.⁶⁴
- Autologous rectus fascia pubovaginal sling (through the retropubic space) when compared to synthetic transobturator tape showed similar success rate. However, autologous rectus fascia sling surgery took longer, had more complications and urinary retention as compared to the synthetic transobturator tape.⁶⁵
- When compared with rectus fascia for pubovaginal sling, fascia-lata in a single center retrospective study has shown to decrease perioperative morbidity, especially wound complications, without compromising functional outcomes.⁶⁶
- For open colposuspension, complete continence rates at 1 year was approximately 85–90%, while failure rates (recurrence of UI) were 17% up to 5 years and 21% over 5 years. About 2% of cases required reoperation. As per the Cochrane review, 70% of women would be dry at 5 years post-surgery.⁶⁷ However, further attempt of open colposuspension after 2 times surgical failure is ineffective.⁶⁸
- Combination surgery (for POP and surge UI) decreases the rate of postoperative surge UI in POP cases at the expense of short-term voiding discomfort.⁶⁹
- Cochrane review comparing laparoscopic colposuspension to open colposuspension suggested that the objective outcomes for the laparoscopic procedure were poorer though subjective cure rates were similar. Laparoscopic procedures were associated with a shorter hospital stay, and lower complication rates leading to cost-effectiveness [greater quality-adjusted life years (QALYs)] over a follow-up of 24 months, and the efficacy may be equal to that of open colposuspension up to 2 years after surgery.^{51,70}
- The rate of bladder or urethral perforation was higher for laparoscopic colposuspension compared with open colposuspension.⁵¹⁻⁷⁰
- Single port laparoscopic Burch colposuspension can be an alternative to scarless surgery.⁷¹

Other Options

Urethral Bulking Agents

Practice statements:

Urethral bulking agents should be considered as the first-line surgical therapy only for women with surge UI and mixed UI with high anesthesia risk, elderly patients, or patients reluctant to undergo surgery	LE1, Grade A
Specific population of failed MUS who have intrinsic sphincter deficiency (ISD) are likely to benefit by a pubovaginal sling (PVS)	LE4, Grade C

Discussion:

- In lieu of the controversies surrounding the synthetic slings following the US-FDA warnings, urethral bulking agents emerged as an alternative treatment option for surge UI in women. Polyacrylamide hydrogel (PAHG) has been the most extensively used bulking agent to treat surge UI in women.

10 Good Clinical Practice Recommendations

- When PAHG was compared to synthetic retropubic slings, the slings were associated with better satisfaction and cure rates than PAHG in women with primary surge UI. However, complications were mainly associated with the vaginal tapes. Thus, the tension-free tape should be offered as the first-line treatment in women who expect to be completely cured by the initial treatment and are willing to accept the complication risks. Since PAHG treatment also provides high satisfaction and cure rates, women with primary surge UI can be offered PAHG as an alternative treatment.⁷²⁻⁷⁴
- Urethral bulking agents should not be offered as the first-line therapy for those women desiring a “one-time” durable solution for primary or recurrent surge UI.⁷⁵
- Urethral bulking agents should be considered as the first-line surgical therapy only for women with surge UI and mixed UI with high anesthesia risk, elderly patients, or patients reluctant to undergo surgery.⁷⁵
- Heterogeneous population of women with surge UI, who develop recurrence, must be evaluated for detrusor overactivity, misplaced sling, and unrecognized ISD. Patients with ISD are more likely to benefit by a PAHG. Other patients with demonstrated recurrent surge UI will be likely do well with a repeat MUS.⁷⁶

Vaginal Laser Therapy

Practice statement:

Vaginal laser therapy has a controversial role in the treatment of surge UI	LE1, Grade A
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Discussion:

- Single arm meta-analysis of published literature reported—vaginal laser therapy (CO₂ and Erbium: YAG laser) can improve the symptoms of women with surge UI. It appears to be a safe, effective, and minimally invasive treatment option for surge UI that can be well tolerated by patients.⁷⁷
- A more recent RCT with control as sham therapy, was unable to show an improvement in surge UI after CO₂ vaginal laser therapy compared with sham treatment.⁷⁸

Artificial Urinary Sphincter (AUS)

Practice Statement

Upgraded evidence is required to define the role of AUS in the management of surge UI in women	LE1, Grade A
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Discussion:

- AUS can provide excellent functional outcomes in female patients with surge UI resulting from ISD but at the cost of a relatively high complications and associated morbidity. High level of evidence is needed to better define the role of AUS in the treatment of female surge UI.^{79,80}

Stem Cell Therapy

Practice statements:

Stem cell treatments in the management of surge UI are to be employed only in the setting of a clinical trial	LE2, Grade A
Until there is definitive evidence available, the source of stem cells, method of administration, and dose are to be customized as per the trial	LE2, Grade A

Discussion:

- The injured or damaged urethral sphincter could potentially be repaired by this modality leading to improved function. Stem cells have been shown to have a definitive role in the management of surge UI.⁸¹

Platelet-rich Plasma Therapy

Practice statements:

Platelet-rich plasma (PRP) in the management of surge UI is to be employed only in the setting of a clinical trial only in patients who do not respond to initial conservative management	LE2, Grade A
Until there is definitive evidence available, the methods of administering PRP are to be customized according to the trial which is to be done	LE2, Grade A

Discussion:

- Autologous PRP is a biological material and can be easily obtained from the blood of the patient and, hence, has low potential adverse effects.⁸²
- PRP injection into the urethral sphincter could potentially enhance sphincter muscle bulk leading to increased urethral resistance.⁸³

MANAGEMENT OF MIXED UI

Supervised intensive pelvic floor muscle training (PFMT) with or without biofeedback is beneficial for curing or improving MUI	LE1, Grade B
All women with mixed UI should first undergo conservative therapies, such as pelvic floor muscle exercises, behavioral therapies, weight loss and drug treatment for urge UI. If symptoms persist, patients with stress predominant incontinence may consider surgery	LE1, Grade B
AMAs and beta-3 agonists are effective for the improvement of urge UI in women with mixed UI	LE1, Grade A
Duloxetine may improve surge UI and urge UI in patients with mixed UI	LEI, Grade B

Discussion:

- Bladder training and intensive supervised PFMT for at least 3 months is helpful in improving symptoms in women with mixed UI.¹²
- Women with mixed UI generally have more severe symptoms and respond less well to treatment than women with only 1 type.⁸⁴
- It is best to begin treatment for mixed UI with conservative management directed toward the most bothersome component of the woman's symptom spectrum and to reserve surgery as a last resort. In women with predominant urgency component or equal stress and urge, first medications for overactive bladder and vaginal estrogens in postmenopausal women be tried and only then surgery for surge UI should be considered.^{8,84}

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