

In the Name of GOD



# POSTOPERATIVE URINARY RETENTION

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# Postoperative urinary retention (POUR)

- Impaired voiding after a procedure despite a full bladder that results in an elevated postvoid residual (PVR)
- Abnormally slow and/or incomplete micturition based on symptoms and urodynamic investigations"

# INCIDENCE

- General surgical population( F&M): 4 to 13 %
- Cesarean delivery done with epidural anesthesia 23 to 28 %
- Pelvic surgery: 2 to 43 %

# Complications

- Extremely painful
- Autonomic response to bladder overdistension
  - Vomiting
  - Hypo- or hypertension
  - Even cardiac dysrhythmias
- Urinary tract infection
- Myogenic changes
- Worse postoperative outcomes

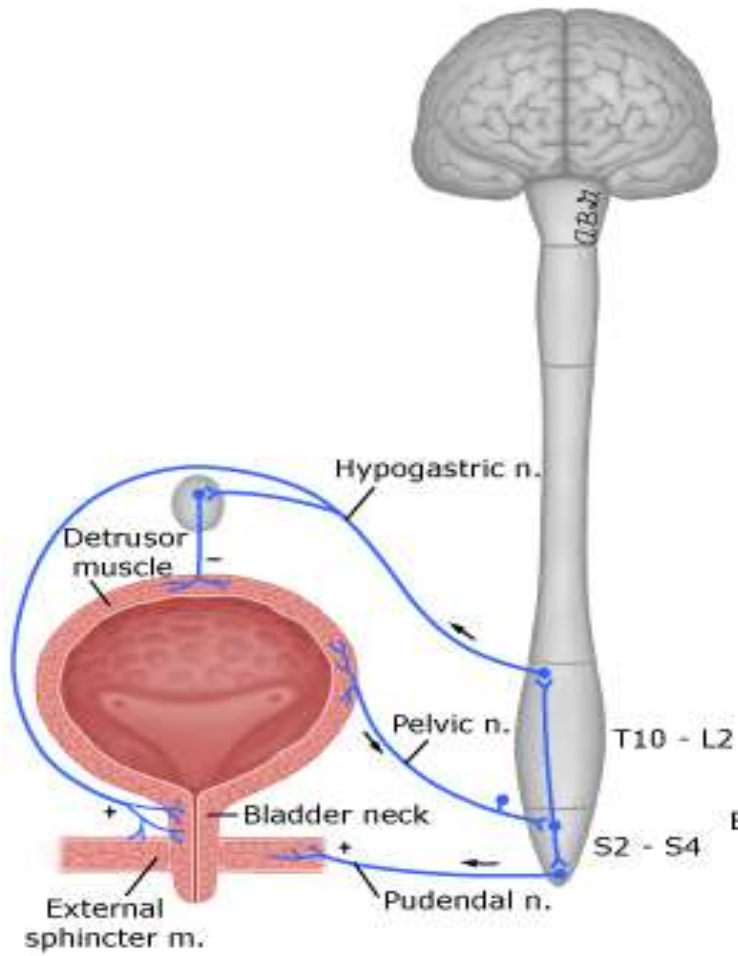
# RISK FACTORS

- Age over 50 years (doubles the risk of POUR)
- History of preexisting urinary retention
- Concurrent neurologic disease
- Administration >750 mL of intravenous fluid
- Duration of surgery >2 hours

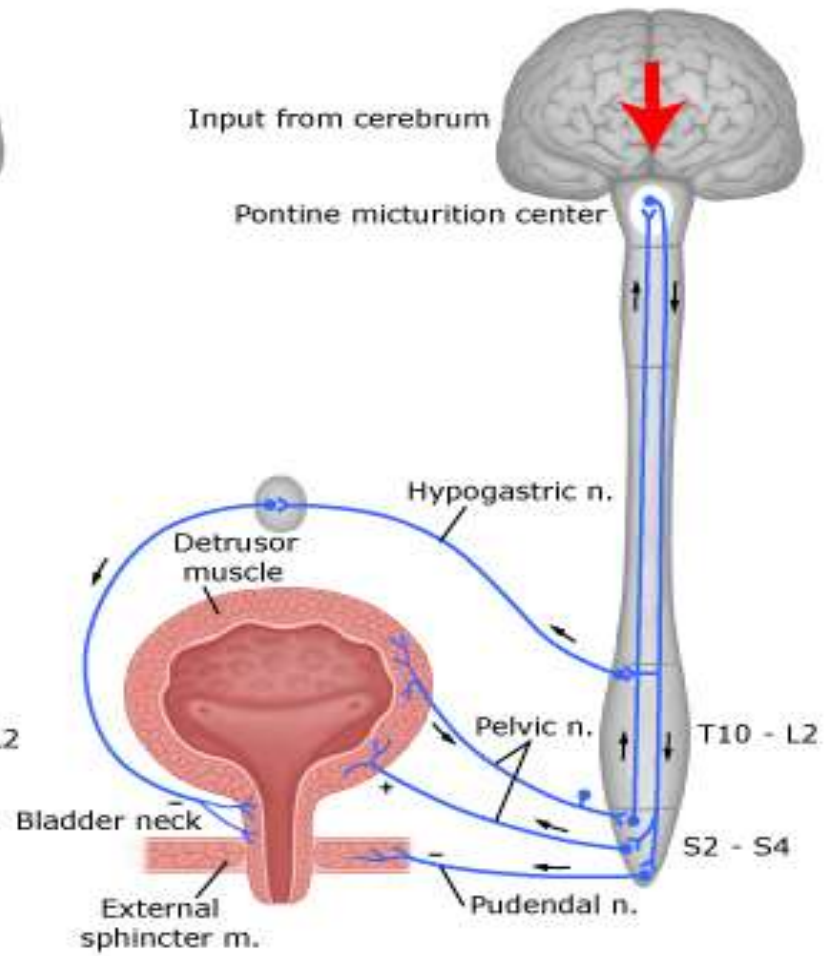
# RISK FACTORS

- Intraoperative anticholinergic medication use
- Use of regional anesthesia
- History of prior pelvic surgery
- Incontinence surgery or radical pelvic surgery
- . . . . . an indwelling bladder catheter, a vaginal pack, constipation

### Filling phase



### Voiding phase



# **Etiology**

- Bladder (detrusor) dysfunction
- Urethral obstruction
- Failure of pelvic floor relaxation



# Detrusor

- Failure to sense bladder filling
- Failure to contract bladder
- Anesthesia/narcotics
- Nerve injury
  - Surgical
  - Acute overdistention injury
- Missed cystotomy
- Preexisting voiding dysfunction

# Urethra/pelvic floor

- Mechanical obstruction of the urethra
- Incontinence procedures
- Urethral perforation/foreign body
- Pelvic organ prolapse
- Failure to relax the pelvic floor
- Constipation/pelvic mass
- Functional obstruction of the urethra

# Preexisting voiding dysfunction

- Preoperative urinary retention (postvoid residual  $>150$  mL) is a risk factor for failed voiding trials after pelvic floor surgery
- An exception: repair of advanced pelvic organ prolapse (POP)

# Anesthetic agents

- Epidural, spinal, and combined spinal/epidural
  - blocks the sensory and motor nerve impulses of the sacral spinal cord
  - suppresses the micturition reflex
  - decreases detrusor contractions
  - increases bladder capacity
- A spinal injection of **bupivacaine** results in seven to eight hours of neural blockade
- The addition of opioids to epidural anesthetics increases the risk of POUR

# Nerve injury secondary to surgery

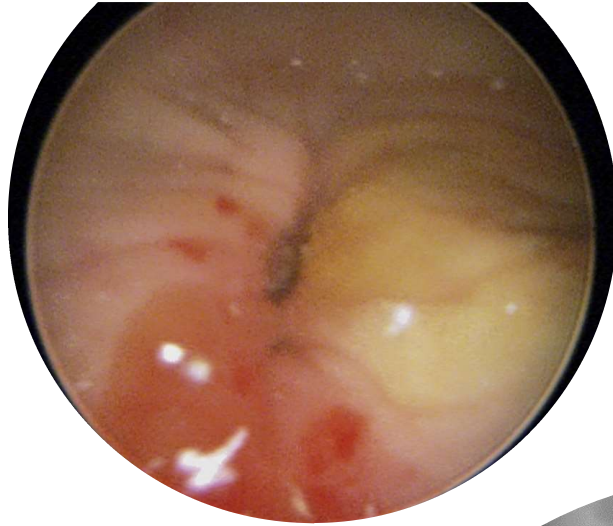
varies with the type of procedure:

- Radical hysterectomy ~ 20%
- Low anterior resection ~ 68%
  
- ✓ The parasympathetic and sympathetic nerves
- ✓ Hypogastric plexus

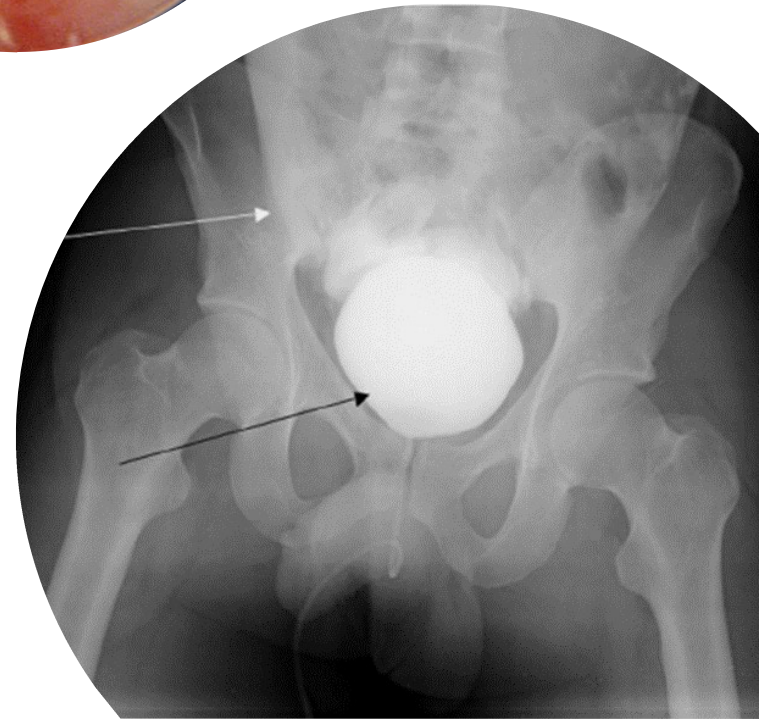
# Cystotomy

- 0.9 to 2.9 % during hysterectomy
- 2 to 5 % during retropubic sling surgery

Complication: lack voiding sensation, suprapubic pain, elevated postvoid residual (PVR), abdominal fullness, detect a fluid wave, fluid leakage across the incision site, or blood-tinged urine, peritoneal inflammation, ileus, genitourinary fistula, and sepsis.



- Can be differentiated from urinary retention by:
- Irrigating the bladder with 75 mL to 100 mL of sterile saline
  - Retrograde cystography
  - Cystoscopy



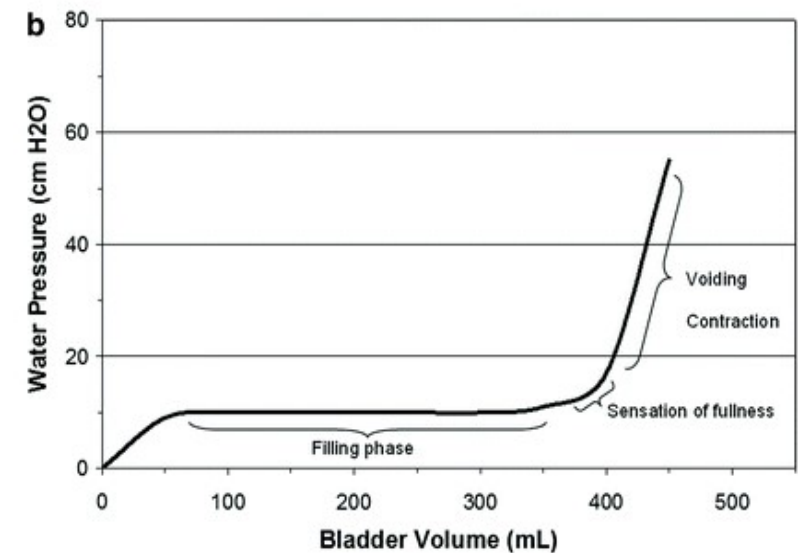
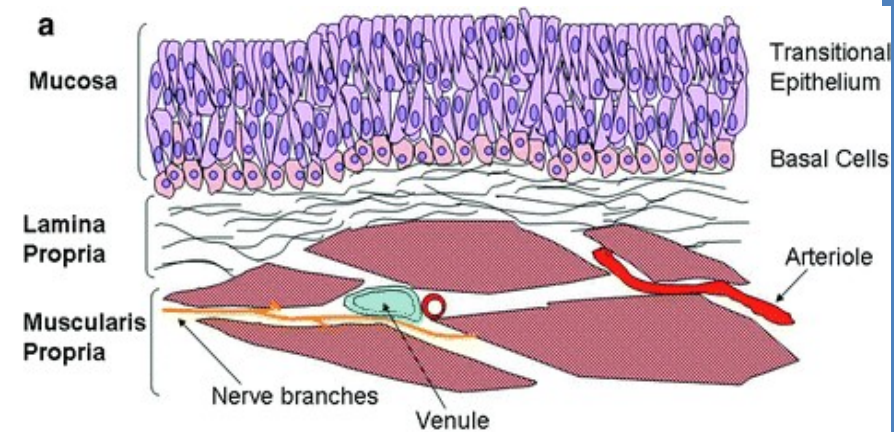
# Bladder overdistention injury

- **Acute**

$\geq 120$  percent of a normal bladder capacity for

$\geq 24$  hours  $\rightarrow$  bladder wall ischemia

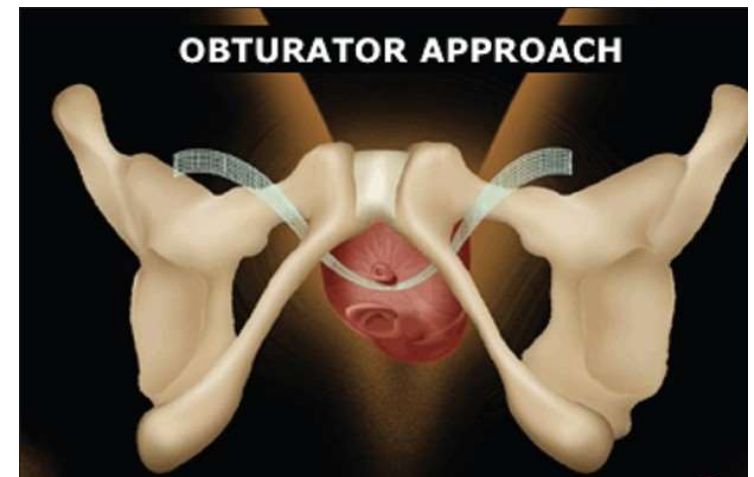
- **Chronic**





# Urethral obstruction

- **Mechanical**
  - Self-limited obstruction (vaginal hematoma, vaginal packing, and tissue edema)
  - Sling obstruction ..... TOT < TVT < Burch < Fascial slings
  - Urethral foreign body
  - Pelvic organ prolapse
  - Urethral injury
  - Constipation
- **Failure of pelvic floor relaxation**



# CLINICAL PRESENTATION

- Slow urine stream
- Straining to void
- A feeling of incomplete bladder emptying
- Suprapubic pressure or pain
- Need to immediately re-void
- Position-dependent micturition

# Differential Diagnosis

- Hypovolemia + postoperative pain
- Iatrogenic bilateral ureteral injury or unilateral injury in a patient with a solitary kidney
- Iatrogenic bladder injury

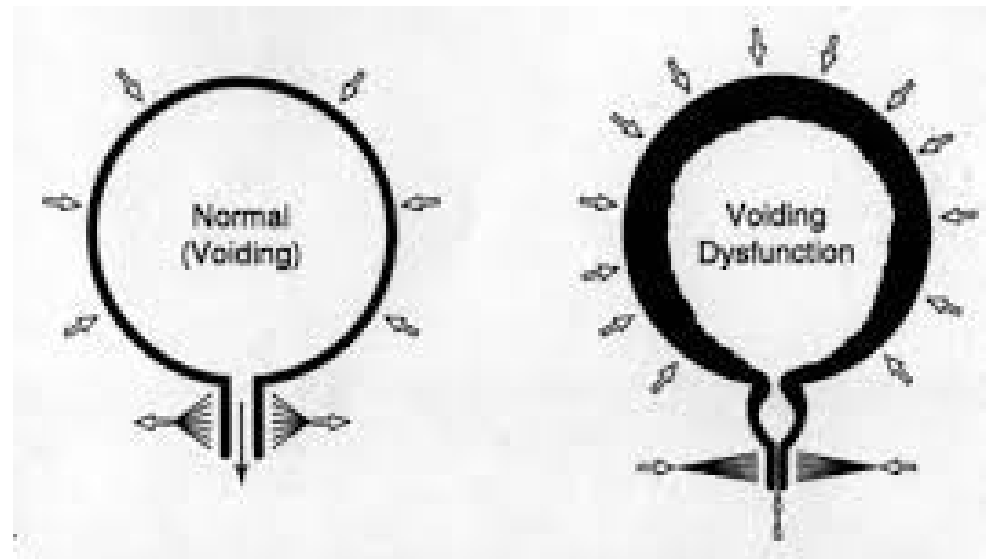
Bladder scan demonstrating a full bladder should rule this out

# DIAGNOSIS

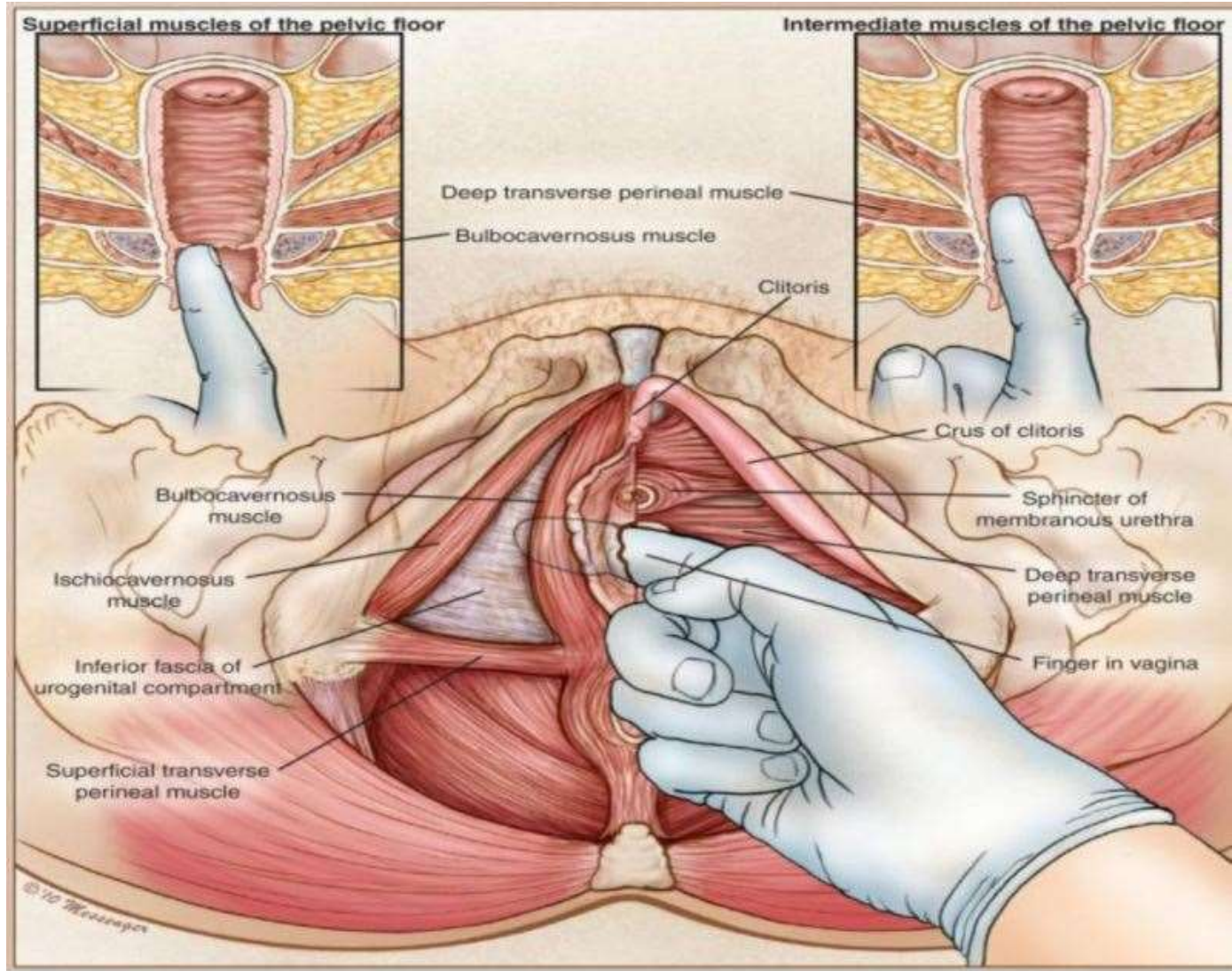
- An elevated postvoid residual volume (PVR > 100 ml)

Bladder catheterization or ultrasound

- Voiding trials
  - Retrograde voiding trial
  - Spontaneous voiding trial



Examination



# MANAGEMENT

**who fail an initial retrograde voiding trial: ..... physical examination**

- CIC (Systemic antimicrobial agents are not used )
- Indwelling catheter
- NO Medical therapy
- NO Urodynamic testing at first

# MANAGEMENT

## **persistent postoperative voiding dysfunction:**

- Assessment of the pelvic floor tone and muscles in the dorsal lithotomy position.
- Digital vaginal examination for prolapse in the standing position
- Urodynamic test (helpful for the vague symptoms of urgency/frequency without signs of retention)

## **Medical and non-medical interventions for post-operative urinary retention prevention: network meta-analysis and risk–benefit analysis (2021)**

- A total of 45 randomized controlled trials with 5387 patients was included in the study.
- Early ambulation, acupuncture, opioid antagonist agents, alpha-adrenergic antagonists and NSAIDs significantly reduce the incidence of post-operative urinary retention with no difference in adverse events. Regarding the risk–benefit analysis of the medical treatment, alpha-adrenergic antagonists have the highest probability of net benefit at the acceptable threshold of side effect of 15%, followed by opioid antagonist agents, NSAIDs and cholinergic drugs.



## **Does Immediate Removal of Urinary Catheter Prevent Urinary Morbidities Following Cesarean Section: A Prospective Randomized Study(2020)**

We randomly assigned 116 patients into early and delayed removal of urinary catheter groups. In the early group, catheter was removed immediately after the procedure and in the delayed removal group, catheter was removed 24 hours later.

### **Conclusion**

Our study showed that immediate removal of urinary catheter was associated with lower urinary complications, shorter length of hospitalization and associated cost

# Intrapartum pudendal nerve block analgesia and risk of postpartum urinary retention: a cohort study

International Urogynecology Journal (2021)

Of the 1007 included women, 499 were exposed to PNB and 508 were unexposed. In adjusted analyses, women exposed to PNB did not differ in likelihood of postpartum urinary retention compared to women unexposed to PNB in either spontaneous (odds ratio[OR]: 0.82, 95% confidence interval [CI] 0.55–1.22) or instrumental (OR 1.45, 95% CI 0.89–2.39) births. Furthermore, no differences between the groups were observed with excessive residual urine volume or catheterization after > 3 h.

## Conclusions

PNB was associated with neither risk of postpartum urinary retention nor excessive residual urine volume and is therefore unlikely to hamper future bladder function.

# Postpartum urinary retention: Absolute risk prediction model

October 2020

This retrospective cohort study analyzed all deliveries from January 2011 to December 2017 in a single Italian university hospital. We used multivariate logistic regression to develop a predictive score for PPUR.

## **Conclusions**

Our study identified non-Caucasian ethnicity, nulliparity, and a BMI  $<30$  kg/m<sup>2</sup> at the end of the pregnancy as minor and epidural analgesia, meconium-stained amniotic fluid, vaginal nonoperative birth, vacuum extraction, pushing stage  $\geq 60$  minutes, and perineal tear as major independent risk factors for PPUR.

# **Curative efficacy of low frequency electrical stimulation in preventing urinary retention after cervical cancer operation**

World Journal of Surgical Oncology (2019)

A total of 91 women with stage IA2–IB2 cervical cancer, who were treated with radical hysterectomy and lymphadenectomy from January 2009 to December 2012, were enrolled into this study and were randomly divided into two groups: trail group (48 cases) and control group (43 cases). Traditional bladder function training and low-frequency electrical stimulation were conducted in the trail group, while patients in the control group were only treated by traditional bladder training. The general condition, rate of urinary retention, and muscle strength grades of pelvic floor muscle in the perioperative period were compared between these two groups.

## **Conclusion**

Low-frequency electrical stimulation is more effective than conventional intervention in preventing urinary retention after radical hysterectomy. It also intensifies the recovery of pelvic muscle strength

