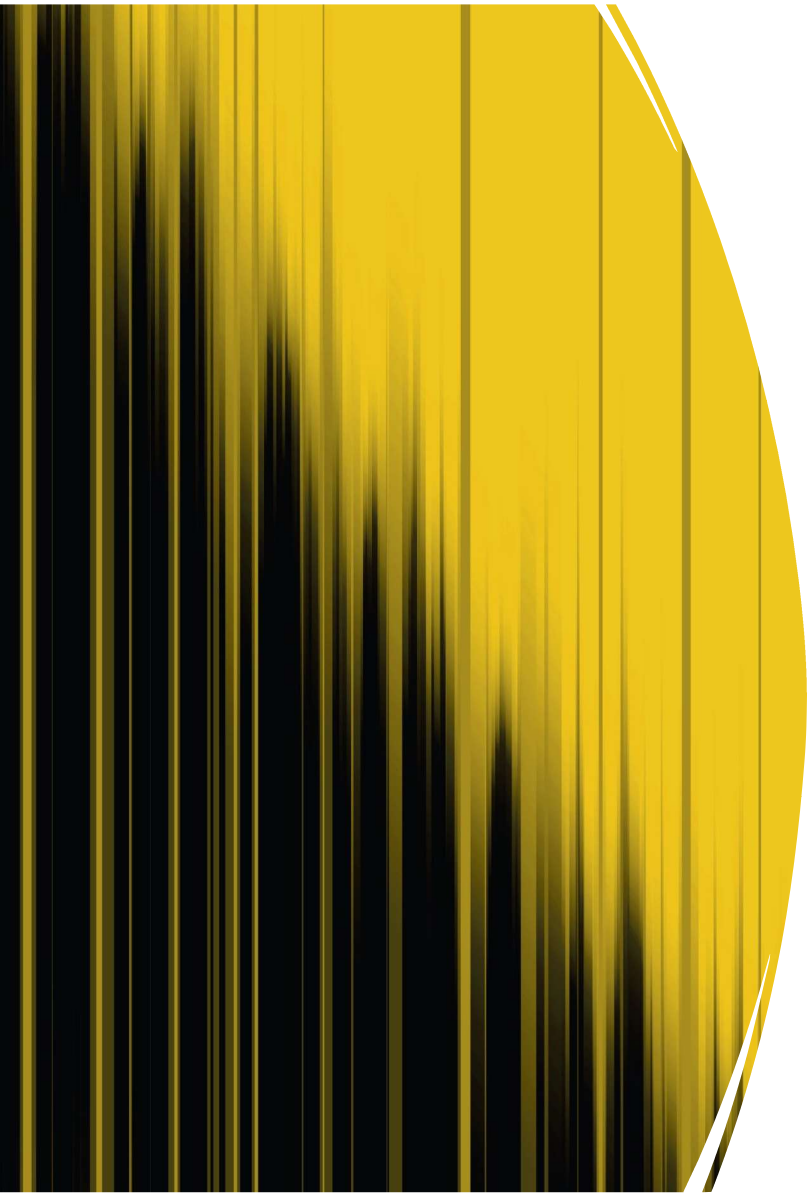


Post-Operative Urinary Retention and the Role of OMT

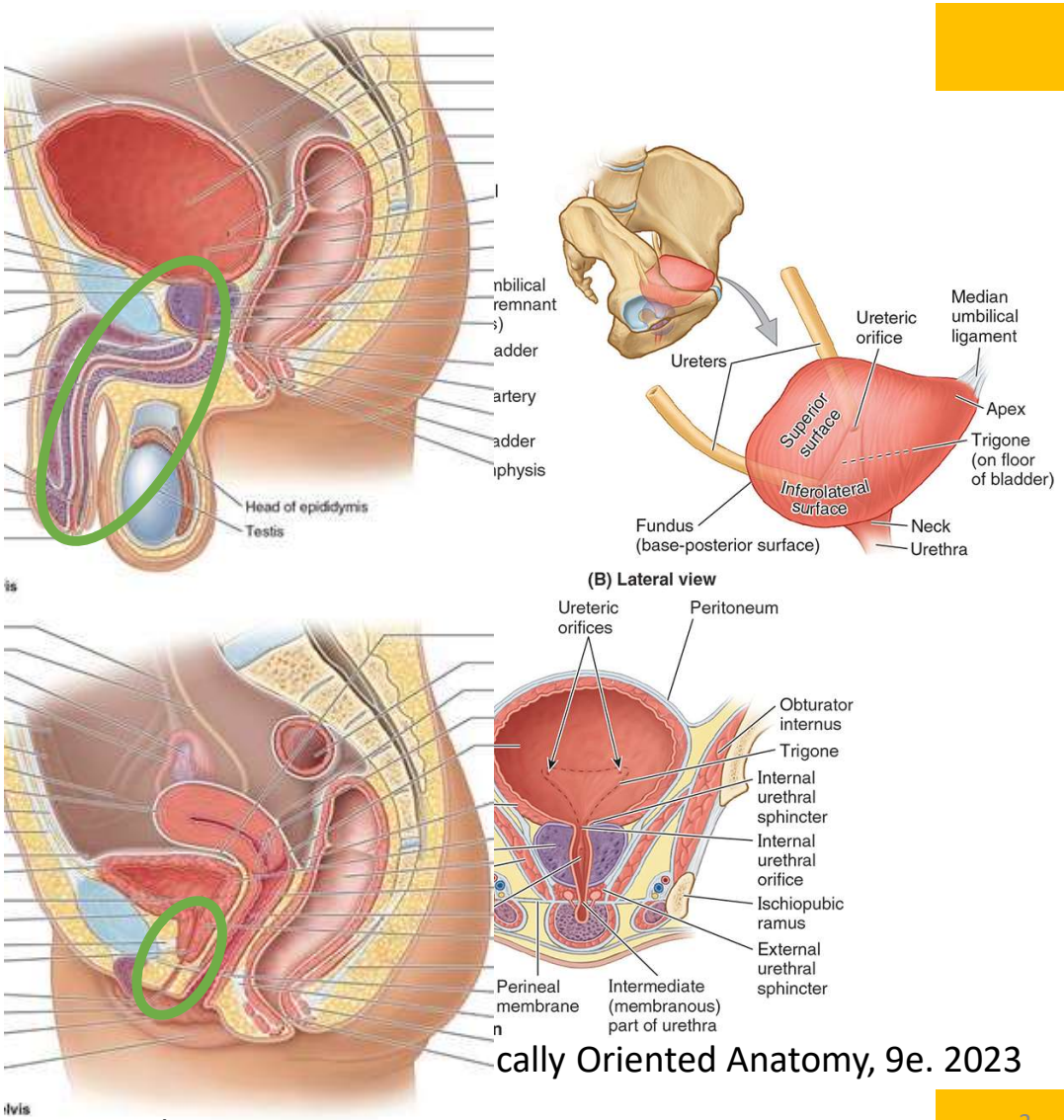
J'Aimee Lippert, DO
Jenn Bryan, DO

Objectives

- Recall the pertinent anatomy and normal urinary physiology
- Explain the pathophysiology contributing to post-operative urinary retention (POUR)
- Describe the risk factors for developing POUR
- Formulate a patient plan to minimize the risk of POUR
- Perform manipulative treatments targeted at reducing POUR risk or improving symptoms

Anatomy of the Urinary Tract[1,2]

- Kidneys
- Ureters
- Bladder
- Internal and external sphincters
- Urethra



cally Oriented Anatomy, 9e. 2023

Figure 6.27, Moore's Clinically Oriented Anatomy, 9e. 2023

Bladder Innervation[1,2]

- Hypogastric Nerve
- Pelvic splanchnic nerves
- Pudendal Nerve
- Visceral Afferents

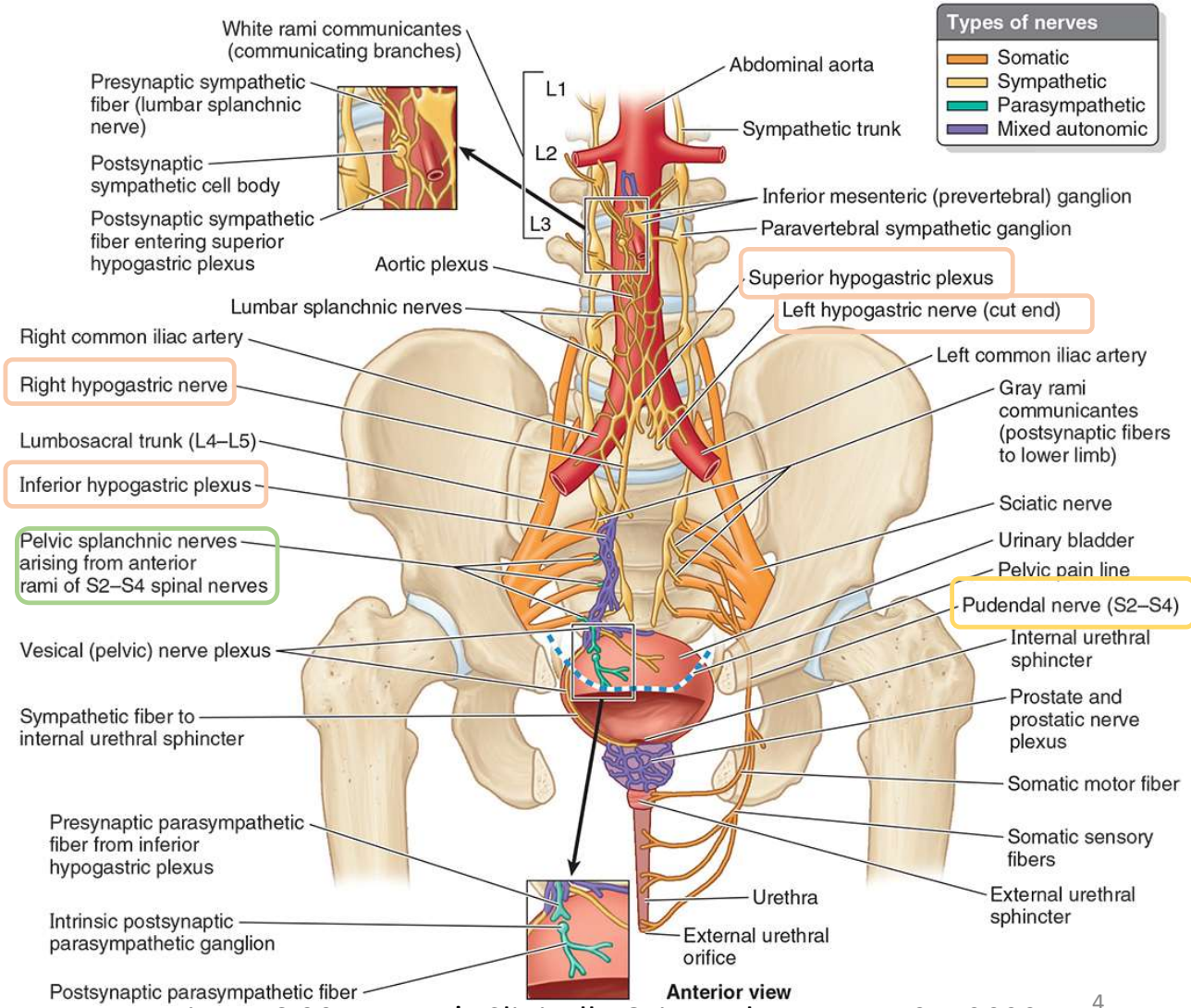


Figure 6.29, Moore's Clinically Oriented Anatomy, 9e. 2023

Storage and Filling[2]

- Storage is sympathetic
- Detrusor muscle encircling bladder is relaxed with periodic contractions
- External (and Internal) Urethral Sphincters contracted
- Central suppression of parasympathetic detrusor contraction

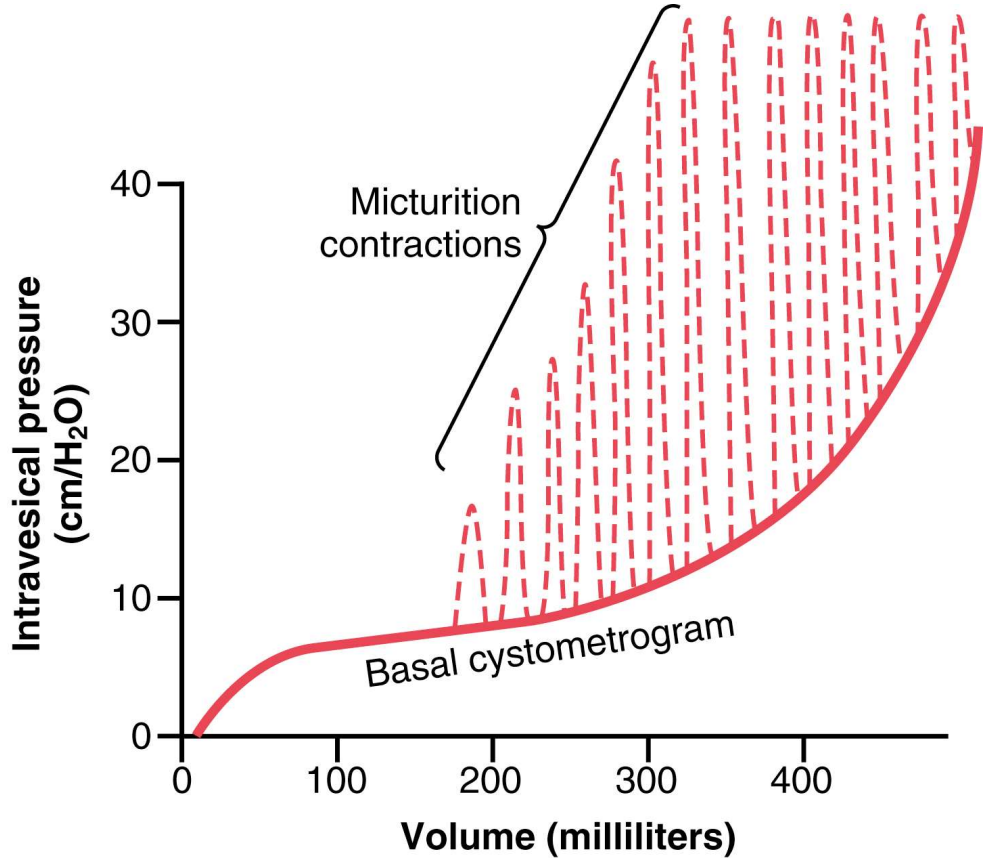


Figure 26-8, Guyton and Hall Textbook of Medical Physiology, 14e. 2021

Emptying[2,3]

- Emptying is parasympathetically controlled
- Detrusor muscle contracts
- Internal sphincter relaxes
- External sphincter is primarily under conscious control after toilet training

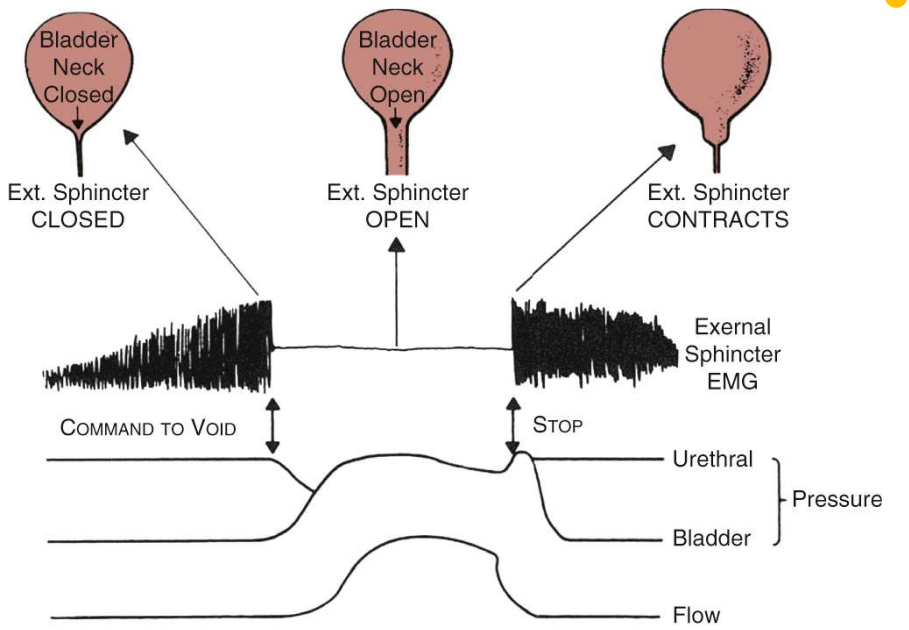
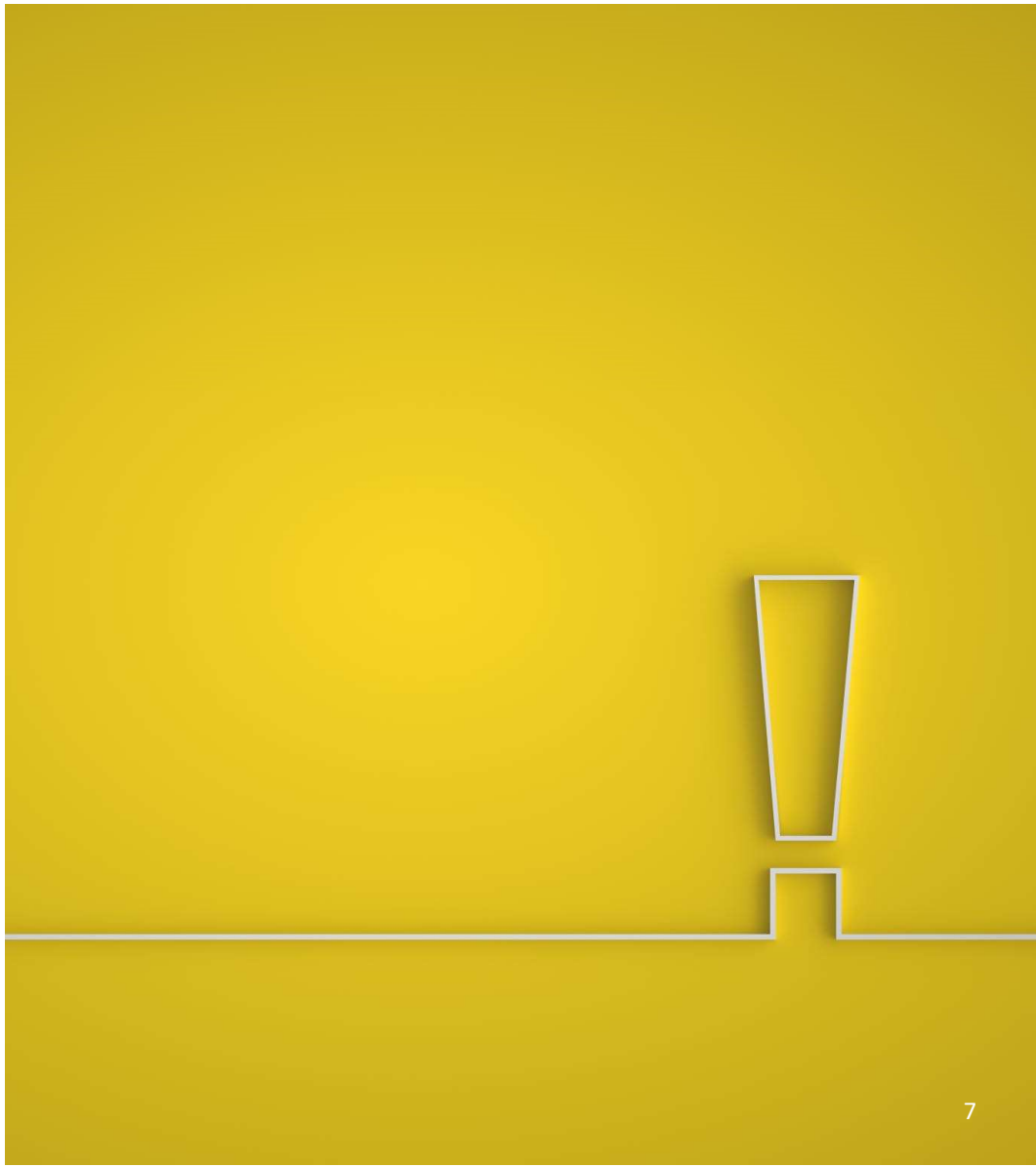


Figure 114.12 Partin AW, Campbell MF, Walsh PC, J. WA. *Campbell-Walsh-Wein Urology*. Elsevier; 2021.

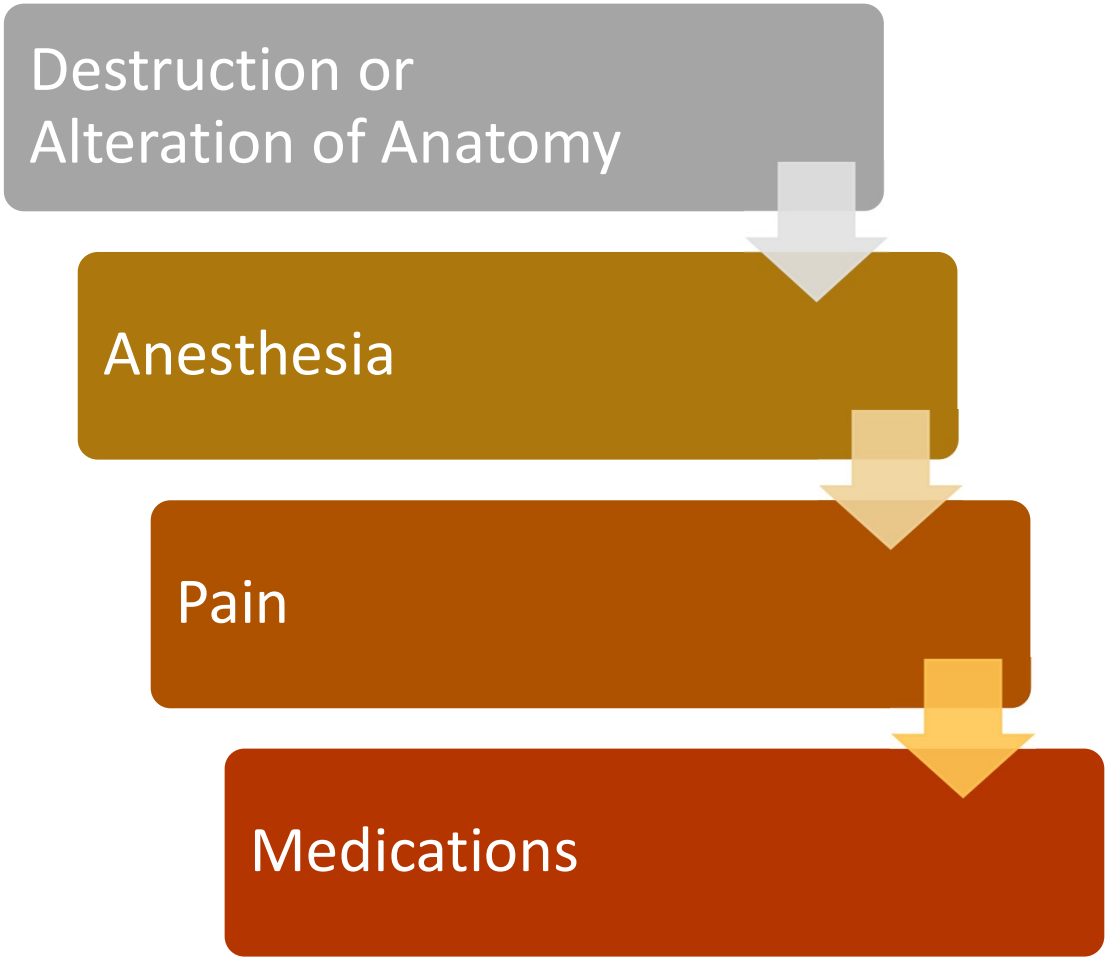
POUR Definition

The inability to urinate after surgical interventions despite a physiologically full or over filled bladder

Variably defined in the literature researching incidence of POUR

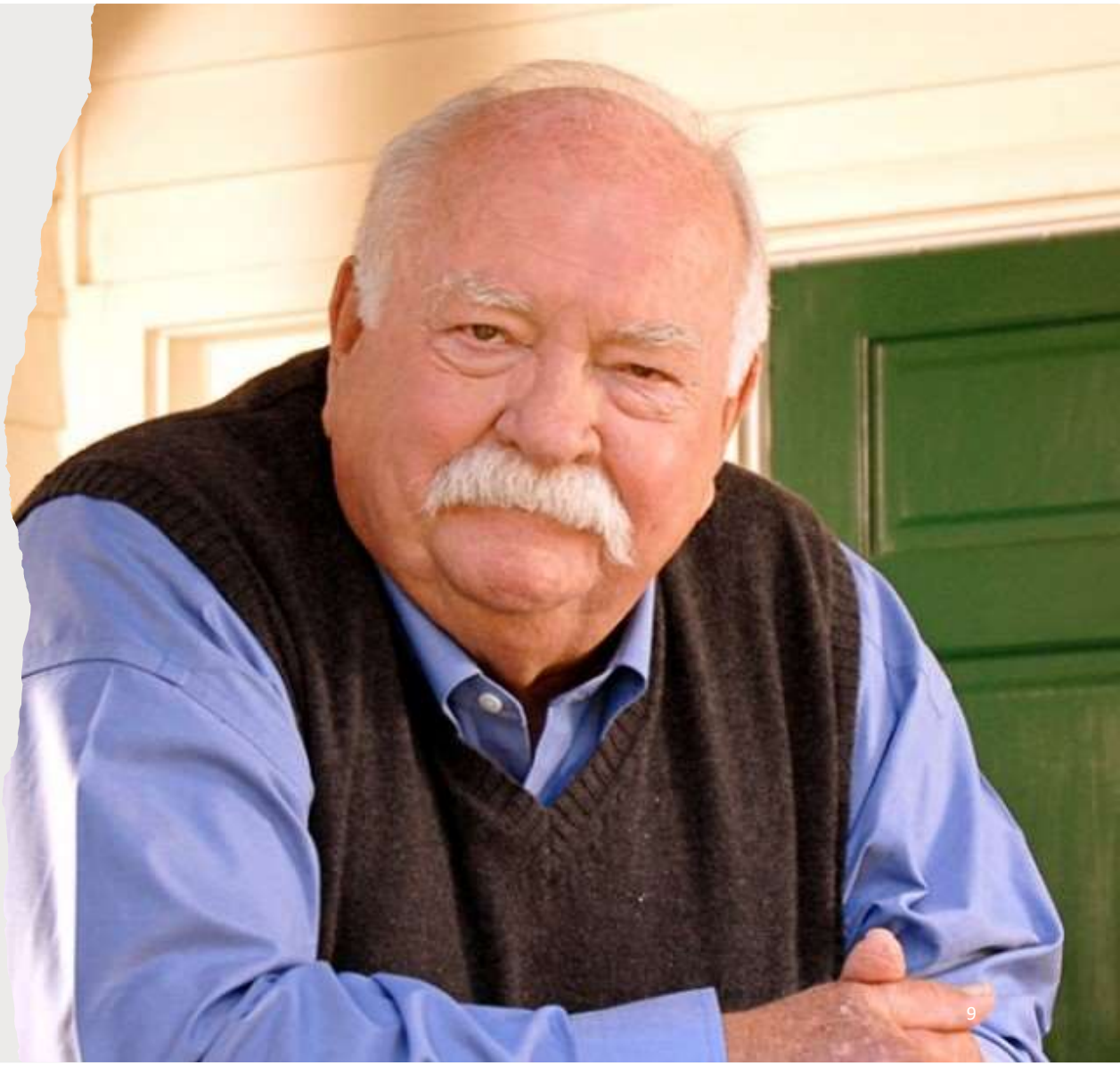


Etiology[3]


Destruction or
Alteration of Anatomy
Anesthesia
Pain
Medications

Incidence and Non-Modifiable risk factors[5,6]

- Overall Incidence
- Non-modifiable risk factors
  - Male sex
  - Age
  - Comorbidities



POUR Outcomes[4]

Progression to chronic urinary retention

- This is an uncommon outcome, however a missed diagnosis or late treatment increases the probability
- Dependent on patients baseline urinary function

Sequelae

- UTI
- Hyper and/or Hypotension
- Arrythmia

Pre-Operative Prevention of POUR[4]

- Identify patients most at risk
  - International Prostate Symptom Score (IPSS) can be helpful to evaluate patients
- Prophylactic medication administration and discontinuation[3,4]
- Patients with higher IPSS may benefit from pre-operative osteopathic structural exam and manual treatment[16]
  - Osteopathic manipulative treatment (OMT) for lower urinary tract symptoms (LUTS) in women:
    - Systemic review and meta-analysis of outpatient OMT to treat lower urinary tract dysfunction. All studies indicated significant improvement in symptoms over no treatment and was at least as effective as pelvic floor muscle training in two studies.

In the past month:	Not at All	Less than 1 in 5 Times	Less than Half the Time	About Half the Time	More than Half the Time	Almost Always	Your score
1. Incomplete Emptying How often have you had the sensation of not emptying your bladder?	0	1	2	3	4	5	
2. Frequency How often have you had to urinate less than every two hours?	0	1	2	3	4	5	
3. Intermittency How often have you found you stopped and started again several times when you urinated?	0	1	2	3	4	5	
4. Urgency How often have you found it difficult to postpone urination?	0	1	2	3	4	5	
5. Weak Stream How often have you had a weak urinary stream?	0	1	2	3	4	5	
6. Straining How often have you had to strain to start urination?	0	1	2	3	4	5	
	None	**1 Time**	**2 Times**	**3 Times**	**4 Times**	**5 Times**	
7. Nocturia How many times did you typically get up at night to urinate?	0	1	2	3	4	5	
Total I-PSS Score							

Score: 1-7: *Mild* 8-19: *Moderate* 20-35: *Severe*

Quality of Life Due to Urinary Symptoms	Delighted	Pleased	Mostly Satisfied	Mixed	Mostly Dissatisfied	Unhappy	Terrible
If you were to spend the rest of your life with your urinary condition just the way it is now, how would you feel about that?	**0**	**1**	**2**	**3**	**4**	**5**	**6**

Taneja, Prostate International, 2017

Intra-Operative Strategies for Reducing POUR

- Catheter placement for longer procedures[5,18]
- Judicious IV fluid administration during surgery[3,18]
- Limit surgical time[19]

Table 2

Multivariate analysis of risk factors for post-operative urinary retention, defined as bladder volume $\geq$ 400 ml (n = 773).

	OR (95% CI)	*P*-value
Age (>50 years)	1.53 (0.96–2.42)	0.071
Gender (=Female)	1.24 (0.77–1.99)	0.377
Duration of anaesthesia/surgery ($\geq$2 h)	1.88 (1.06–3.36)	0.032
Spinal anaesthesia	3.22 (1.94–5.36)	< 0.001
Intraoperative i.v. fluid ($\geq$ 1000 ml)	1.57 (0.95–2.59)	0.080
No pre-anaesthesia voiding	4.20 (2.46–7.16)	< 0.001
Type of surgery (=Orthopaedic)	1.54 (0.94–2.51)	0.084
Emergency surgery	1.76 (1.08–2.87)	0.024

Hansen, Acta Anesthesiol Scand, 2011

Post-Operative Strategies for Reducing POUR

- Suprapubic hot pack[7]
- Early ambulation[4]
- Reduce post-operative opiate use through multi-modal pain management[4, 8-11]
- Autonomic and somatic nervous system modulation

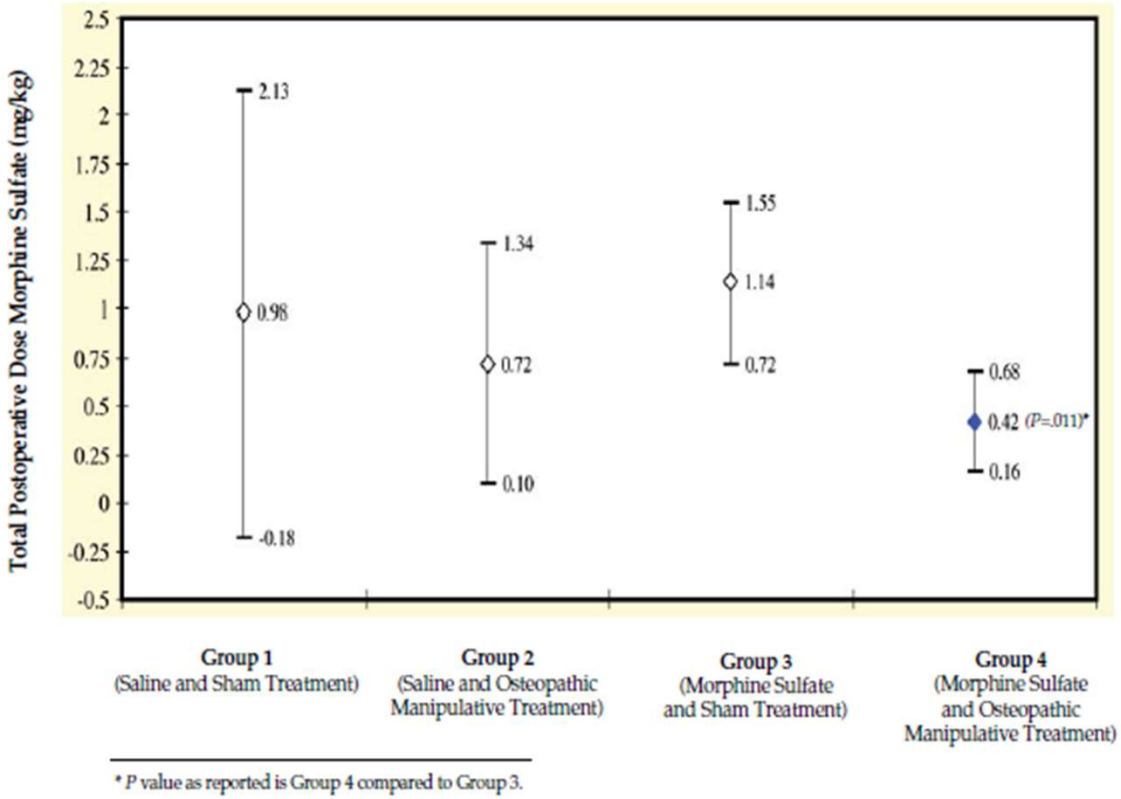
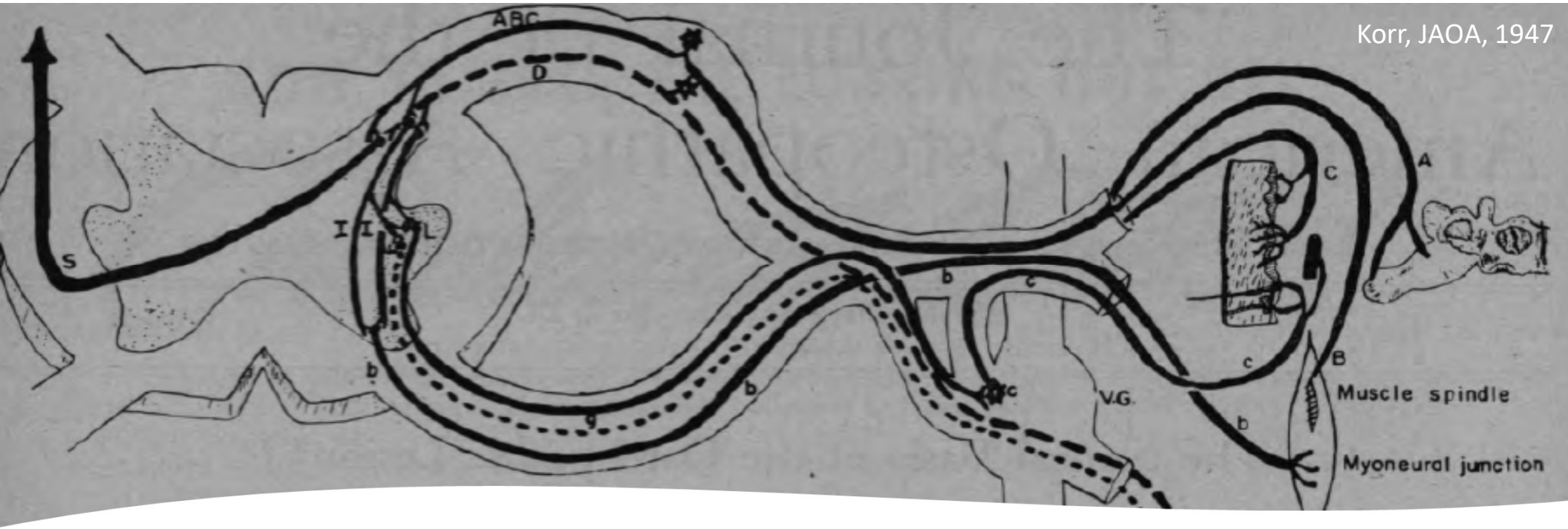


Figure 3. *Second 24 hours after surgery (25–48 hours): total postoperative dose of morphine sulfate (mg/kg). Values presented are arithmetic averages with 95% confidence intervals.*

Morphine given pre-operatively, OMT applied post-operatively
Goldstein, JAOA, 2005



Modulation of the nervous systems

- We see from a variety of sources that autonomic dysregulation can be managed through the soma
  - Research of Irvin M. Korr
  - Hemodynamic Improvements in post-cardiothoracic surgery patients[12, 13]
  - Reduction of IBS symptoms and quicker return of bowel function[10, 14]

Evidence Directly Regarding Urinary Tract

Case study on pudendal neuralgia[17]

- Several closely timed anorectal surgery and subsequent intense perineal burning and pain
- Extensive workup, including electroneurography indicated Pudendal nerve entrapment
- Received 3 months of oral medication treatment with improvement
- 5 once weekly treatment resulted in near resolution of all symptoms

Case series on urinary incontinence[18]

- 21 women with a wide range in severity and duration in complaints who sought chiropractic care.
- Manual muscle testing done in applied kinesiology model and patient treated with Cox flexion distraction decompression technique.
- Most women noted improved symptoms including no longer requiring incontinence briefs

A Proposed Musculoskeletal Treatment Plan for the POUR patient

- Optimized for the hospitalized patient since this setting is typically more restrictive
- May also be applied pre-operatively to patients with risk factors for developing POUR
- Start with assessing the thoracic, lumbar, sacrum, abdominal, and pelvic regions for TART
  - For most of the techniques I recommend today, assessment and treatment can be done from the same initial hand position
- As always, these techniques should be applied with attention to the patient's clinical picture and tolerance.

Diaphragm Myofascial Release

- Often a good place to start in the post-surgical patient
- Handholds can be applied bilaterally or unilaterally depending on the patient and operators needs
- Typically done seated or supine
- Aim is to improve the fascial strains on the abdominal ganglia and descending sympathetic fibers.
- Can also improve rib excursion and mid-back pain

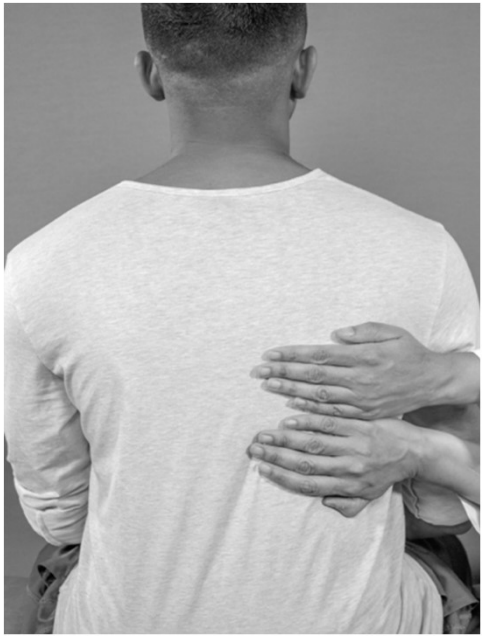
Channell, The 5-Min Osteo Manip Med Consult, 2020

Nicholas, Atlas of Osteopathic Techniques, 2023

Rib Raising and Paraspinal Inhibition

- Endless variations of patient and operator positions
- Aim is to decrease sympathetic tone to the bladder to allow for parasympathetically mediated emptying
- Added benefits in improved rib excursion, increased lymphatic movement, and decreased mib-back and low back pain
- Rib raising is considered dynamic and can be adjusted to the clinical picture
- Paraspinal inhibition is typically static and held for up to 90s at a time
- Placing hand between bedsheet or chuck and mattress helps when placing hand under the supine patient

Beatty, The Pocket Manual of OMT, 2e, 2011



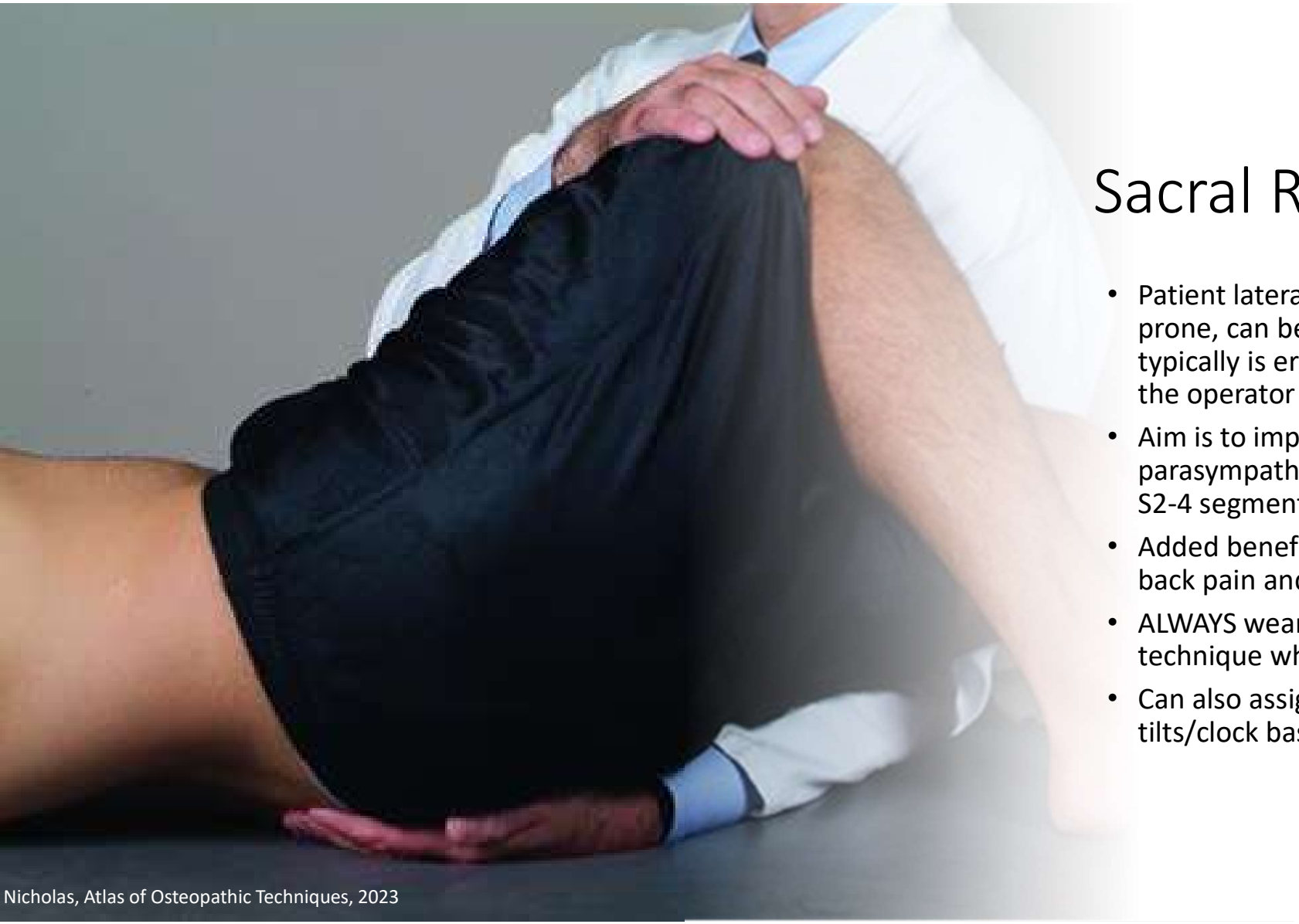
Channell, The 5-Min Osteo Manip Med Consult, 2020

Nelson, Somatic Dysfunction in Osteo FM, 2e, 2015

Bilateral Pelvic Myofascial Release

- Can be done by using with either bilateral leg hold while patient is supine or with bilateral ASIS contact
- Typically, one of these handholds will be available and away from the surgical site
- Aim is to reduce myofascial strains associated with disruption of local anatomy and subsequent repair with remaining tissue to improve neural input to the bladder
- Added benefits of improving low back pain

Nicholas, Atlas of Osteopathic Techniques, 2023



Nicholas, Atlas of Osteopathic Techniques, 2023

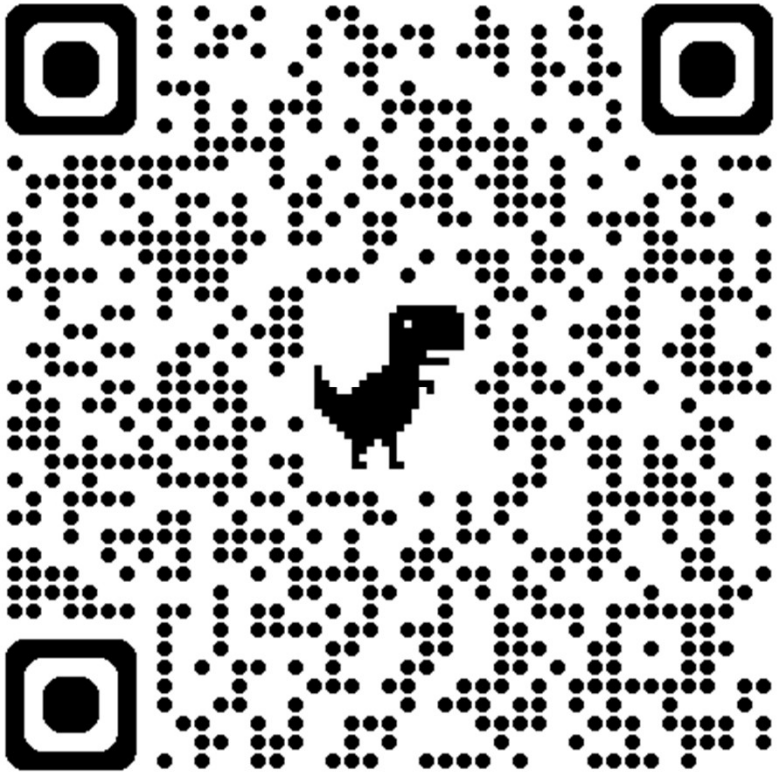
Sacral Rocking

- Patient lateral recumbent or prone, can be done seated and typically is ergonomically poor for the operator
- Aim is to improve parasympathetic output from the S2-4 segments
- Added benefits in improving low back pain and bowel motility
- ALWAYS wear gloves for this technique when inpatient
- Can also assign patient pelvic tilts/clock based on the patient

If you start to worry that you don't practice this enough, remember 4 things:

1. The risk of serious adverse events is low with OMT overall and lower for techniques like myofascial release
2. You don't need to be great at OMT for patients to benefit
3. Treating the patient in front of you counts as practicing
4. You can bill for the procedure

AOA Osteopathic Billing and Coding Guide



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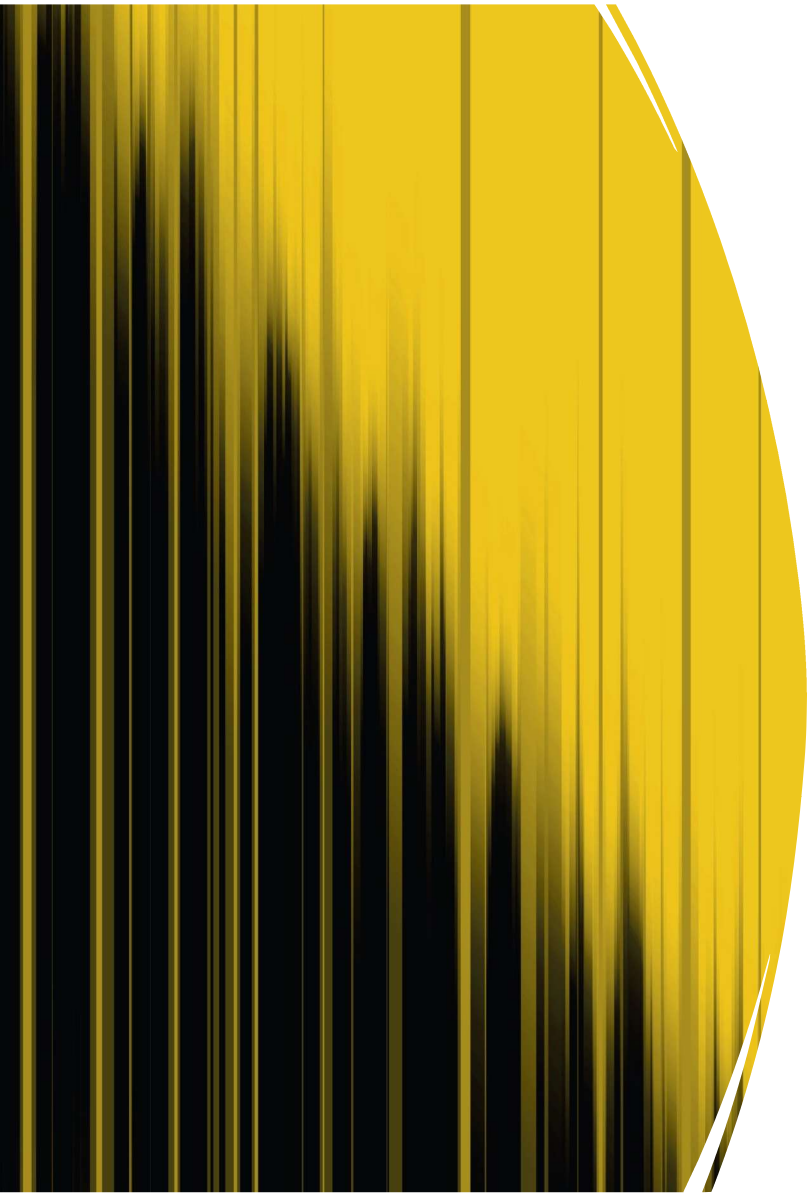

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