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Evaluation & Treatment of Coccydynia

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Learning Outcomes

At the close of this course, participants should be able to:

- Define the anatomy & physiology of the coccyx and surrounding structures.
- List at least three possible seating modifications to improve the symptoms of coccydynia in patients.
- Describe at least three tests or measures that can be helpful in evaluating patients with coccydynia.
- Describe at least four interventions that may be helpful in the physical therapy treatment of patients with coccydynia.

Scope of the Problem

- Exact prevalence-unknown
- Risk factors
 - 5x more common in women than men
 - Adolescents and adults more likely than children to develop coccydynia
 - Obesity?
 - Increased risk for posterior subluxation (due to less pelvis tucking when sitting) and trauma
 - However, same studies show that lower weight subjects have increased risk of hypermobility and anterior subluxation

Causes of Coccydynia

- Trauma
 - Vaginal delivery (especially instrument assisted or shoulder dystocia), fall, near fall, direct blow, water slide
- Repetitive microtrauma (sitting on hard surfaces or sitting awkwardly)
- Pelvic floor spasm (especially unilateral)
- Scar tissue from pilonidal cyst removal or coccygectomy
- Idiopathic
- Rapid weight loss
- Pelvic organ prolapse

Characteristics of Coccydynia

- Pain with sitting
- Worst with leaning back, sitting on hard surfaces
- May be better if sitting on the toilet or a donut cushion
- Pain with transitions, especially sit to stand
- Pain likely improves with walking
- Bowel movements & sex can be painful

Prognosis

- 90% of cases resolve with conservative care only



Medical Treatment of Coccydynia

- First line: lifestyle adaptations
 - Cushions, heat, cold, sitting posture
- Second line: physical therapy & medication
 - NSAIDS are the most common, opioids not recommended
- Third line: injections
 - Typically lidocaine and/or steroid
 - Directed toward sacrococcygeal joint or ligaments
 - Ultrasound or fluoroscopy guided
 - Nerve blocks can also be used
- Final resort: coccygectomy

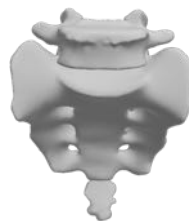
Coccygectomy

- Removal of the coccyx
- Soft tissue structures may be tacked down or left to scar down on their own
- Good overview of some different surgical techniques here: <https://www.dovepress.com/an-evaluation-of-two-different-methods-of-coccygectomy-in-patients-wit-peer-reviewed-fulltext-article-JPR>
- Post op PT not necessarily standard of care- should it be?

Anatomy & Physiology

Bony Anatomy

- Fibro-cartilaginous joint
- Relatively mobile, up to 70 deg of motion during defecation, position changes, and breathing
- Movement during childbirth



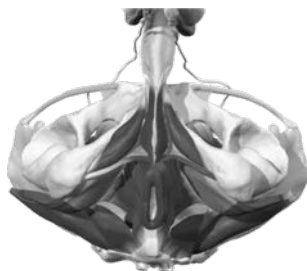
PERIAL PICTURES™

Variations of Normal

- Type I (about 70%)-coccyx angles slightly forward, apex angles caudally
 - Least likely to develop idiopathic coccydynia
- Type II (about 15%)-coccyx angles forward more sharply, apex angles anteriorly
- Type III (about 5%)-coccyx angles sharply forward between 1st and 3rd or 2nd and 3rd segments
- Type IV (about 10%)-coccyx is subluxed anteriorly at the level of the sacrococcygeal joint or between 1st and 2nd segments

Soft Tissue Anatomy

- Pelvic Floor



PRIMAL PICTURES™



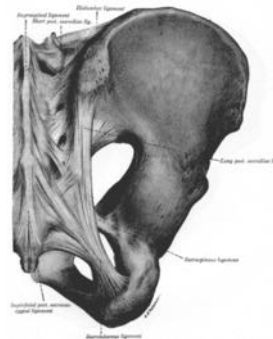
PRIMAL PICTURES™

Soft Tissue Anatomy

- Anterior sacrococcygeal ligament
- Lateral sacrococcygeal ligament
- Superficial posterior sacrococcygeal ligament
- Supraspinal ligament



Henry
Vandyke
Carter
[Public
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Physiology-Breathing

- 70 degrees of movement during breathing

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Physiology-Stooling

- Bowel & coccyx very closely related
- Full rectum can press against coccyx
- Rectal problems can cause coccyx pain and coccydynia can cause pain with stooling

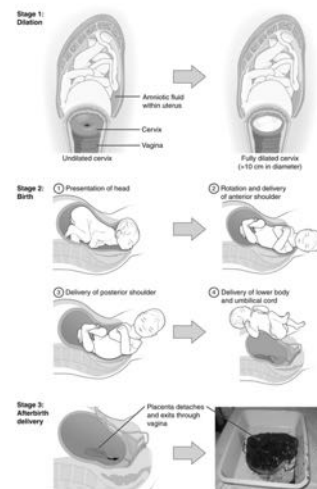
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Physiology-Childbirth

- Coccygeal movement during vaginal delivery
- Postpartum coccydynia occurs most often in deliveries where the mom was sitting on in lithotomy
 - Can be fractured or displaced
 - Also can be from soft tissue injury

Vaginal Delivery

- Cervix opens and moves anterior
- Pelvic floor muscles are stretched to 2-3 times normal length
- Sacrum-top part widens and moves posterior during early labor-at end stage, bottom portion widens and coccyx moves posterior



OpenStax College [CC BY 4.0 (<https://creativecommons.org/licenses/by/4.0>)]

Complications Impacting the Coccyx



- Baby or mom's positioning less than ideal for labor-leads to uneven pressures on sacrum/coccyx/pubis symphysis
- Instrument assisted delivery
- Pelvic floor tearing
- Complications from epidural placement
- Shoulder dystocia
- Long OR short pushing stage








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Constipation

- One of the most common digestive complaints in US
- Difficult to diagnose – symptom vs. disease
- High correlation with incontinence, especially in children
- Rome III criteria used
 - Must include ≥ 2 of the following:
 - Straining
 - Lumpy or hard stools
 - Sensation of incomplete evacuation
 - Sensation of anorectal obstruction/blockage
 - Manual maneuvers to facilitate defecation (digital evacuation, support of the pelvic floor)
 - < 3 defecations/week
 - Loose stool rarely present w/o use of laxatives
 - Insufficient criteria for IBS-C

Constipation

- Common comorbidity
- Chicken? Egg? Does it matter?

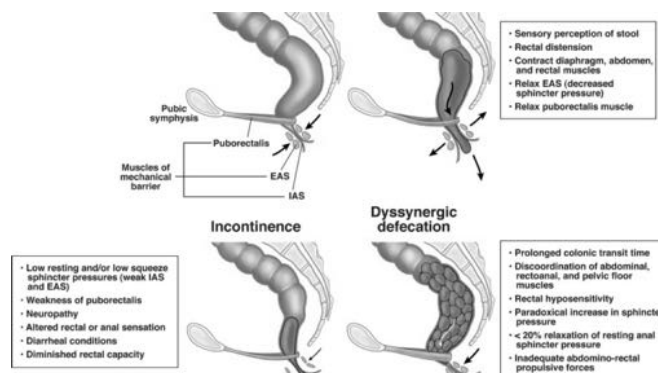
BRISTOL STOOL CHART		
	Type 1 Separate hard lumps	Very constipated
	Type 2 Lumpy and sausage like	Slightly constipated
	Type 3 A sausage shape with cracks in the surface	Normal
	Type 4 Like a smooth, soft sausage or snake	Normal
	Type 5 Soft blobs with clear-cut edges	Lacking fibre
	Type 6 Mushy consistency with ragged edges	Inflammation
	Type 7 Liquid consistency with no solid pieces	Inflammation

Cabot Health, Bristol Stool Chart [CC BY-SA 3.0 (<https://creativecommons.org/licenses/by-sa/3.0/>)]

Types of Constipation

- Normal Transit – (most common) normal transit time and frequency – perceived difficulty with evacuation or presence of hard stools
- Slow transit – decreased neuromuscular function of the colon (medications (including pain medication), neurological or metabolic disorders)
- Outlet dysfunction
 - Dyssnergic defecation – (“paradoxical contraction”) EAS contracts vs. relaxes
 - Encoporesis-rectum is stretched out from too much stool

Dyssnergic Defecation



Courtesy, Dr. Steve Hodges

continued

Pilonidal Cyst

- Cyst that forms in a hair follicle, can become infected
- Treatment: drain (frequently recurs), excise, may need to leave wound open
- Symptoms can mimic coccydynia
- Scar tissue following excision can cause coccydynia also



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Evaluation

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Subjective

- Mechanism of injury, aggravating and easing factors, pain behavior, **functional limitations**
- Red flags-stress fracture, cancer, infection, bowel red flags
- Yellow flags-pain behaviors, psychosocial factors

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Objective

- Gait analysis
- Lumbar & pelvic girdle screening
- Hip screening
- Breath analysis
- Pain reproduction screening with springing over inominates, sacrum, SIJ
- Full body functional movement assessment-imbbalances leading to coccydynia?
- Pelvic floor internal evaluation?

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Coccyx Palpation-external



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Pelvic Floor Palpation-External



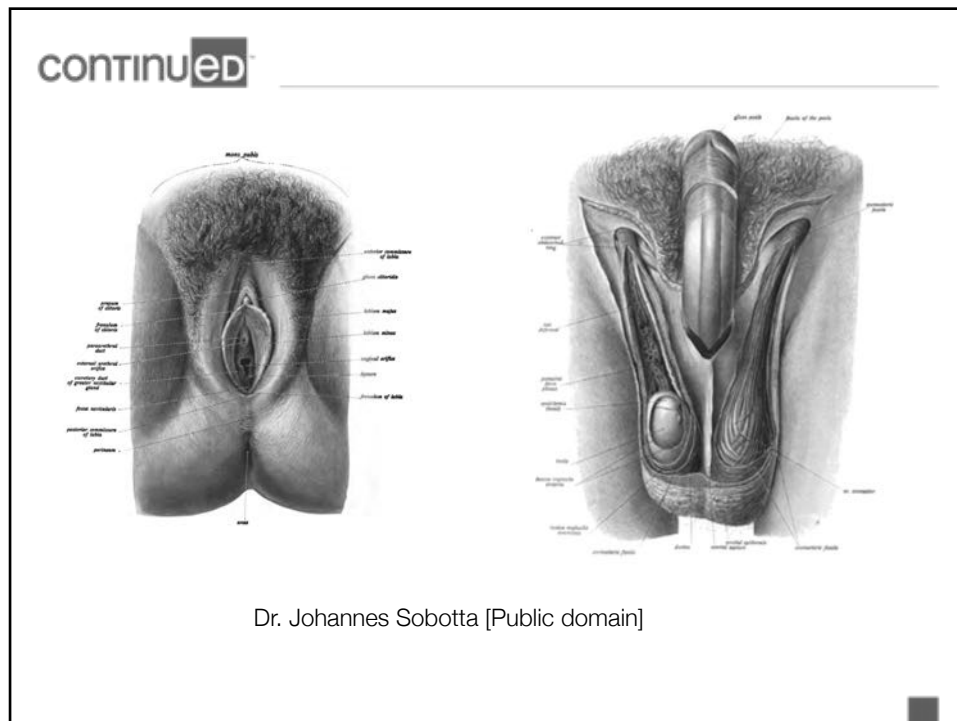
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Coccyx Palpation-Internal

- Sometimes palpable intravaginally, but usually best done intrarectally
- Consider external screening first if you think there is a lateral deviation or are not sure if internal is necessary
- Patient in sidelying or possibly hooklying
 - Which side up? Depends on what you want to do
 - Exam vs treatment

Coccyx Palpation-Internal

- Begin with visual exam
 - Range of “normal” in terms of anatomy
 - Looking for major skin deficits, irritation, signs of infection
 - Hemorrhoids
 - Fissures
- When ready to proceed into physical exam:
 - Detailed explanation of exam process
 - Use of WATER BASED lubricant (Slippery Stuff)
 - Use of non latex gloves
 - Informed consent from patient, time for questions as needed
 - Fine balance between giving patient enough information and not “freaking them out” by making it sound foreign
- Instruct patient to bear down as you insert your finger



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Coccyx Palpation-Internal

- Position, tenderness, mobility
- Soft tissue mobility of pelvic floor muscles
 - Caution: make sure you don't assume the external anal sphincter is the pelvic floor!

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Coccyx Palpation-Internal

- INSERT VIDEO NAMED COCCYX INTERNAL EVALUATION HERE

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Coccygeal Movement Test

- Patient in sitting, sidelying, standing
- Place proximal portion of hand on sacrum with 2nd and 4th digits on gluteal muscles and 3rd digit on coccyx
- Request a contraction of pelvic floor
- Inward displacement of coccyx=correct contraction
- Outward displacement of coccyx=straining/bulging/ incorrect contraction
- No displacement of coccyx=nothing



Functional Assessment

- Muscle balance and intra-abdominal pressure regulation across the system
 - 360 trunk musculature
 - Pelvic floor
 - Diaphragm
- Pelvic floor/diaphragm pistoning system
- Functional movements (single leg stance, squat, sit to stand)
- ASLR test
 - <https://www.raynersmale.com/blog/2014/9/22/active-straight-leg-raise>



Treatment

The good news: conservative treatment is successful in 90% of cases!

Treatment

Manual Therapy

Joint Mobilizations

- Hip, lumbar, pelvis, sacrococcygeal
- Consider assessing and treating thoracic spine (Mohanty, 2017)
 - Group 1-stretching of piriformis and iliopsoas
 - Group 2-same as above plus Maitland's rhythmic oscillatory thoracic mobilization over hypomobile segments
 - Group 3 (conventional)-seat cushions, sitz bath, phonophoresis
 - Groups 1 and 2 significantly improved over group 1, group 2 somewhat >group 1



Coccyx Mobilizations

- External
 - “Stuck drawer” mobilization
- Internal
 - Coccyx mobilizations-distraction, lateral, can use just inside finger or grasp between finger and thumb
 - Can do a grade V mobilization (manipulation)-typically a distraction with “hook”

External Coccyx Mobilization

- Stuck Drawer Technique
 - Patient in seated, therapist hooks fingers under tip of coccyx
 - Patient slumps down, then sits up
 - As patient sits up, therapist “glides” coccyx (posterior mobilization/slight distraction)



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External Coccyx/Soft Tissue Mobilization

- Patient in sidelying
- Ensure you are moving sufficiently in an inferior direction



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Internal Coccyx Mobilizations

- INSERT VIDEO NAMED COCCYX INTERNAL MOBILIZATIONS HERE

Pelvic Floor Mobilization

- For patients with pelvic floor spasm or tenderness contributing to coccydynia
- Can be done intravaginally, intrarectally, or externally
- Trigger point release, myofascial work, scar work if applicable

Pelvic Floor Mobilization-External



Pelvic Floor Mobilization-Internal

- GENTLE!
- Slow, soft movements (no “sweeping”)
- Support patient’s knees on a bolster, your shoulder, the wall, etc.
- May be helpful to have patient do relaxation/deep breathing prior to soft tissue work or during soft tissue work
- Seated position is better for you-power differential

Abdominal Adhesions

- Form as a response to trauma (surgical or impact or emotional!) AND inflammation (endometriosis, pelvic inflammatory disease, gallbladder/appendix inflammation, irritable bowel syndrome, Crohn’s disease, UTIs, etc.)



Abdominal Soft Tissue Mobilization

- Abdominal adhesions can impair bowel function leading to constipation & coccydynia
- Assess structures involved, amount of restriction, tenderness of structures
- Cross friction massage/mobilization
- Fascial and muscular release
- Rolling
- Desensitization

Scar Mobilization

- Work into as tolerated
- Cross friction, stretching, mobilization with movement
- Remember to assess/treat through multiple layers
 - Skin
 - Muscle
 - Fascial/visceral

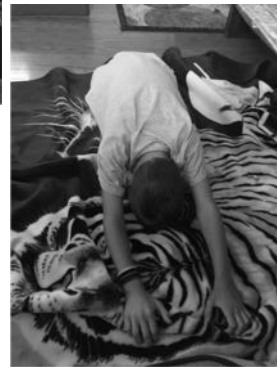
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Treatment

Exercise

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Stretches



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Breathing

- Importance
 - Diaphragm lowers with inhalation (abdomen rises/expands, PFM descends, coccyx extends)
 - Diaphragm rises with exhalation (abdomen lowers, internal organs rise 1-3 cm, PFM lift, coccyx flexes)
- Symmetry
 - 360 deg expansion/ “opening an umbrella”
- Retraining/facilitation techniques
 - “Breathe into my hands”
 - Therapist using hands to facilitate diaphragm stretch, coccyx mobility, and/or rib excursion
 - Train in multiple positions



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Breathing as a Stretch



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Breathing Progressions

- “Wing arm”
- Sidebend plus breathe



Pelvic Floor Downtraining

- Address pelvic floor overactivity due to or contributing to coccydynia
- Focus: teaching patient to actively relax/elongate the pelvic floor
- Use of mindfulness as an aid
- Deep breathing exercises
 - Open glottis exhale
- Cuing patient to try to “open” their pelvic floor around a proprioceptive input
- Cue: “drop the elevator down to the basement”-NOT maximally bulge!
 - Some people relate better to “trampoline sag”

Pelvic Floor Up Training

- Prolapse
- Intra-abdominal pressure regulation
- Isolated contractions →
Multidirectional →
Functional



Muscle Imbalance Correction

- What was too tight? What wasn't activating quickly or ideally? (Or what was activating too quickly?)
- Do they need to down regulate their muscle activity/learn a graded contraction?
- May need individual muscle strengthening OR motor control retraining

Treatment

Constipation Treatment
Seating Considerations
Mindfulness
Pain Education

Constipation

- Behavioral modification (should be first line treatment)
 - Toileting posture, potty mechanics, fiber intake, fluid intake, spreading meals throughout day, aerobic exercise
 - Intake/output diary
 - <https://www.youtube.com/watch?v=YbYWhdLO43Q&t=2s>

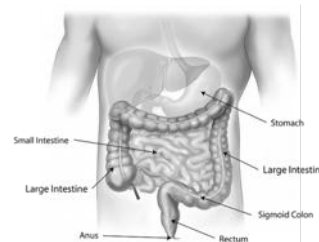


Constipation

- Mobility assistance (bowel massage, abdominal work)-contraindications: surgery within the last 6 weeks, bowel obstruction, radiation to the abdomen within the last 6 weeks
- Defecation training
 - Open glottis exhale
 - “Widen waist” cue
 - Using abdominals to assist as PF and EAS elongate and open

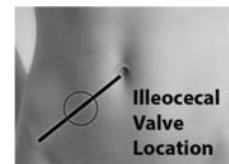
Bowel Massage

- Assist with bowel motility
- 10-20 minutes, 10 circular motions in direction that the large intestine runs
- Can also do long sweeping motions in direction of the bowel
- Teach patient to self mobilize



Ileocecal Valve Facilitation

- Can be very helpful for patients with motility issues/mechanical constipation
- Fingers on ileocecal valve-feels like a thickened spot about the size of a dime
- Sink into it, slowly let off just until you can feel it moving (it rotates clockwise/counter clockwise)
- Gently assist in the movement



Seating Considerations

- Avoid cushions that are overly hard or soft
- Can be helpful to unload the coccyx itself using cushions with cutouts, wedge cushions, rolled up towels, etc.
- Breaks can be helpful

Mindfulness

- A mental state achieved by focusing one's awareness on the present moment, while calmly acknowledging and accepting one's feelings, thoughts, and bodily sensations, used as a therapeutic technique.
- Goal: eliminate “secondary suffering”, combat cortical smudging
- By focusing on what is, the person is able to take steps to cope or change
- Mindfulness training teaches participants meditation techniques that increase awareness of present-moment experiences, including thoughts, emotions, and bodily sensations, with a gentle and accepting attitude towards oneself.

Mindfulness-Why Use It?

- Patients who struggle with depression, anxiety and/or chronic pain have lower levels of trait mindfulness and more difficulties with emotion regulation than healthy controls suggesting mindfulness training may be helpful
- Regain bodily awareness helps with neuromotor control training!)
- The brain is your most powerful tool! Tap into it!
 - We know people can elevate their body temperature, decrease heart rate and blood pressure, etc. using the brain

Mindfulness Exercise Options

- Mindfulness exercise with questions during normal activity
- Guided meditation of some sort (Youtube, Headspace, etc.)
- Mantra
- Awareness to combat specific thoughts
- Body scan to improve awareness
- Use to combat anxiety with specific activity

Pain Education

- Chronic pain changes brain structurally, functionally, chemically
- Decrease in gray matter
- Changes in areas of the brain related to reward, aversion, and others
- Change in levels of neurotransmitters
- The good news: it can be rewired!

Pain Education

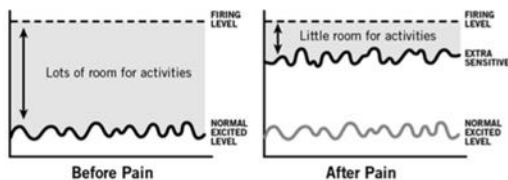
- Critical element: tissues heal, rewire the brain
- Couple with desensitization work to “teach” the brain activity tolerance and improved processing of signals in that area
- May couple with manual therapy: alter the input to change the output
- Active listening and validating with education



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Pain Education

- You aren't crazy!
- It's all in your head, but it's not your fault, it's your brain
- Explaining in a relatable way
 - Science
 - Word pictures



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Why Do I Hurt?, Louw 2013 OPTP

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Questions?

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