

concerns, therapy may help a child to tune into a sense of bladder or bowel pressure or fullness and to self-prompt to toilet. Therapies addressing the somatic system and cuing into body signals and sensations is required (Boxes 2.6–2.7).



Figure 2.2 Child on computer with legs crossed and the body flexed.

**Box 2.6 Bodily signs of stress, and pelvic centering**



There are so many interconnections in pelvic health in the myofascial body, and most medical training focuses on isolated evaluation of “problem areas.” Yet observing posture, respiration, and movement can offer clues for therapy. General stress and anxiety may be considered with crossed arms and legs in sitting, and shallow respiration. The seated experience of the “pelvic clock” and “pelvic rocking” can begin to help children tune into their pelvic area and promote a natural body scanning (see Figures 2.3–2.7). Cues may be provided as to “notice where you are making pressure” or “notice the bones you sit on, the sit bones” while holding up a pelvic model, or “make circular motions like the hands on a clock, or to the points on

a star.” The pelvic clock exercise was useful in the pediatric case of Jaquelyn below, in her introduction to pelvic therapy.



Figure 2.3 Seated neutral spine on bolster.



Figure 2.4 Rocking right.



Figure 2.5 Rocking left.



Figure 2.6 Slump.



Figure 2.7 Arch.

### Box 2.7 A pediatric patient case: Jaquelyn



Jaquelyn, age 10, was referred to physical therapy (PT) for constipation that was resistant to laxatives. She had stopped her dance classes due to her problems, which included abdominal pain, bloating, and random bowel and bladder leaks requiring pads and clothing changes at school and home. Her mom reported that she had occasionally needed suppositories as an infant and even a few enemas, and in middle school she started having stomach pains. Her parents did not know that she was avoiding toilet use due to painful defecation, and only passing one or two stools per week. A visit to the emergency room three months prior had involved an X-ray showing she was “very backed up” and an enema was performed, which was

painful for her, yet it resulted in a large amount of stool elimination. Jaquelyn’s physician recommended twice daily laxative use (polyethylene glycol) and sitting on the toilet for 15 minutes after each meal. After starting laxative use, she had almost daily episodes of loose stool, including the need for pad use and occasional clothing changes. Jaquelyn sat with her arms crossed at her waist and her head down in the waiting room. She turned away from the PT and said, “I do not want to be here.” On her intake paperwork, her mom had written in “autism, picky eater,” and checked “urinary incontinence, fecal incontinence, and constipation.” Her first session introduced her to the “pelvic clock” exercise. (Jaquelyn’s pelvic program outline is listed in more detail in the therapy section in this chapter.)

## PARENT/CAREGIVER STRESS

Parents may be overjoyed with an infant who quickly learns “potty training” and develops autonomy with bathroom use. Yet parents can experience a phenomenal amount of stress and need for expert intervention, including social/emotional support, in the case of a child’s failure to meet continence goals. Prolonged dependency on diapers, clothing changes, and hygiene

assistance may occur. Other household members, from siblings to other relatives, need to help with continence training. From occasional bedwetting to the more serious condition of daily urinary or fecal incontinence, parents may consult multiple providers for assistance. Disruptions in work attendance, school, and playtime occur with pediatric continence issues, and/or pelvic pain.

## LEARNED WITHHOLDING BEHAVIOR

The experience of straining and pain with passing large stools may lead children to withhold stool, and to avoid toilet use, and even reduce food and water intake to limit the need for bathroom use. Constipation creates increased pressure on the bladder and, as such, is a trigger for bladder leakage, and bladder leaks can be the first sign of the presence of constipation. (Remember this fact; it will be repeated as it is often missed in client

care.) Toileting avoidance due to fear of pain can develop into a chronic pain cycle with resistance to toileting, muscle tensing, and significant illness with potential megacolon. Interventions for care should ideally optimize nutrition and digestion, promote bladder and bowel functioning to “work” automatically, and for the child to have tools and habits to be the “boss” of their body.

## THERAPY FOR PEDIATRIC PELVIC HEALTH

---

A multifaceted treatment approach is required, customized to each child and their family milieu, and recognizing barriers to rehabilitation. The child's health history of potential pelvic anomalies at birth, antibiotic use (gut microbiome disruption), surgery, cognitive status, gross and fine motor level skill, and somato-emotional state are all considered in planning care. Psychological stressors such as a recent move, loss of a family member, school change, or parental separation or divorce can also impact child health status and onset or aggravation of pelvic floor dysfunction.

### The biopsychosocial model and pelvic health

The whole person view is considered with the biopsychosocial (BPS) model as outlined by the World Health Organization international classification functioning, disability, and health (Wade and Halligan 2017). The BPS model is useful in whole person care and identifies a health condition (such as pain or constipation), biological factors (body functions and structures/genetics), and individual activities (such as self-prompting to the toilet, and life as a student) and participation status (such as community outings or play with friends). The

BPS model also considers environmental factors (such as bathroom stalls, tall toilets, no privacy) and personal factors (such as psychological and cognitive factors: anxiety, autism, OCD). Providers using the BPS model can include evidence-based medicine in a compassionate manner with recognition of all individual attributes and challenges (Rajindrajith, Devanarayana, and Benninga 2013; Scorza, Stevenson, and Canino 2013).

A framework for pediatric pelvic care will first address child psychosocial status, which may be indicated by body language, speech, and eye contact, as well as intake history. Pain, perceived lack of bodily control, and medical intervention such as enema therapy may have set the stage for fight or flight or freeze behavior, with sympathetic nervous system up-regulation. In the case of anxiety, fear, health care provider avoidance, and anger, trauma sensitive programming can help to promote trust and patient and parent program adherence. Pelvic health therapy has the potential to help a child feel comfortable in their body, confident in speaking up about the need for restroom use, and foster child-centered, empowered communication with holistic providers, and with medical care.

## PEDIATRIC PELVIC PROGRAM OUTLINE

---

Pelvic therapy involves education, movement therapy, fluid and fiber management, nutrition adjustment, daily activity recommendations, encouraged toilet use after meals, and improved defecation and/or urination mechanics including

posturing and muscle synergy. Movement therapy may be combined with bodywork/manual therapy for optimizing function. Teaching children to “say hello” to body areas can be helpful and add an element of play.

## MANUAL THERAPY: SAYING HELLO TO THE BODY AND ITS PARTS

---

In application of manual therapy for pelvic health, hands-on care may be provided to the spine, abdomen, pelvis, hip, trunk, and other

regions (Box 2.15). Treatment is performed ideally with parents or caregivers observing and receiving instruction in possible follow through with

hands-on care at home if the parent is able and interested. A child can be directed to “say hello” to the area where the bladder sits, or the colon has its final “train tracks” in the left lower pelvis, and other hello cues. Laughter may accompany this education!

Surgical sites of scar tissue from procedures may be palpated by the therapist to assess superficial to deeper fascial systems in the musculoskeletal, neurological, visceral, and lymphatic regions, and to mobilize restrictions. Facilitation of full respiration may be attained with gentle work to the rib cage, diaphragm, and abdominal wall (Figures 2.13–2.15).

### Box 2.15 Compassion based manual therapy with client empowerment



Steps to provide manual therapy include:

1. Education of the client and family as to what will be done, and the rationale
2. Asking permission to provide hands-on care, as in “May I feel your belly to see how it is today?” or “May I place my hands on your back to help your breathing?” or “Would you like me to show mom or dad how to help your belly with a massage?”
3. Educating the client as to the option to say “no,” “not today,” or other statements to empower self-awareness, choice, and control
4. The therapist feeling energetically balanced and non-striving, having adequate time and attention for the client



Figure 2.13 Diaphragm and lateral costal facilitation in child's pose.



Figure 2.14 Abdominal wall/diaphragm facilitation, legs on bolster.

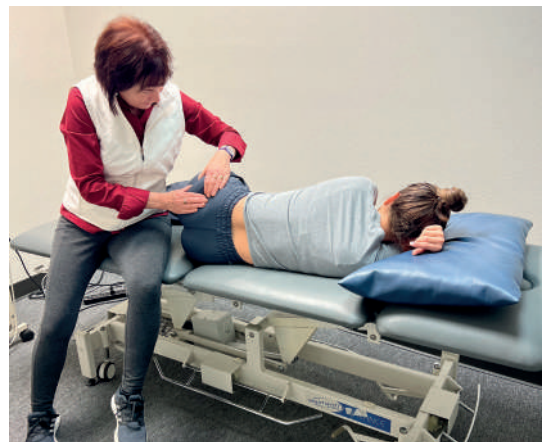


Figure 2.15 Gluteal massage, side lying.

Colon massage is very helpful in promoting awareness of body regions and body “signals” as well as restoring the motility function of the colon. (See Figure 10.2.)

Food sensitivities and allergies may be present, requiring analysis and nutrition training for parents and children. (Yet those in lower socioeconomic groups likely will not have access to this type of care.) Teaching and training in toilet mechanics is standard and can be accomplished with child friendly graphics and coloring books, parent and child education in the use of a footstool for stability, and the role of pelvic muscle relaxation required for emptying bladder and bowel. Sitting with knees open and relaxed diaphragm breathing is a starting point. Practice in gentle bearing down to assist bowel emptying requires abdominal wall tensing, and relaxing pelvic outlet muscles. Relaxed pelvic status for urination is trained, versus pushing urine out or rushing. Ultrasound and biofeedback may be used by medical providers to train function (Box 2.16).

### Box 2.16 Real time ultrasound imaging (RUSI)

Medical providers can screen and train the effort for PFM relaxation, bearing down mechanics, as well as contraction/lift of the PFM. These mechanics may be screened with visual inspection, with digital palpation of the abdominal wall and external PFM, with real time ultrasound (RUSI), and/or with biofeedback (BFB) using electromyography sensors on either side of the external anal sphincter. RUSI and BFB guide accurate training of the PFM, including cues towards muscle strengthening for activities such as “stop a fart, stop your pee” as well as relaxation strategies and defecation mechanics. (BFB equipment allows the biologic signal of the nerve firing to be changed into a graphic representation on a computer screen.)

Graphics such as flowers, fractals, or spirals opening and closing can engender a peaceful sense during PFM BFB training.

### Client self-care with parents’ support

Tools for patient use include:

- daily tracking of supplements, fluid, fiber
- Bristol stool scale output tracking (#1–#7)
- episodes of urinary incontinence or fecal incontinence
- constipation: no output that day
- relaxed sitting on the toilet after meals
- colon massage
- exercise.

By utilizing a detective process, a tracker, the child and/or adult care provider can promote adherence to a program, and awareness of the triggers for the problems. A healthy habit tracker can be used to cue the child and the parents towards pelvic control and confidence, as well as optimizing hydration and nutrition.

For younger children, a reward system such as stickers, a toy box, verbal praise, and parent directed “special privileges” such as a park outing may help motivate towards compliance with pediatric pelvic rehabilitation. Children may choose a prompt they would prefer such as a chime sound on a computer or vibration on a watch to cue body scanning for bowel or bladder signals and for urinating every two hours if leaks are occurring from infrequent void attempts.

Therapeutic exercise can include aspects of the developmental sequence that address child specific limitations, such as reciprocal patterning with crawling, poor trunk stability, and altered respiratory dynamics. Stability ball exercises add an aspect of play that can be fun for the therapist and the child (Figures 2.16–2.21).



Figure 2.16 Quadruped on a ball.



Figure 2.17 Rocking back.



Figure 2.18 Rocking front.



Figure 2.19 Ball squeeze.



Figure 2.20 Ball push out.



Figure 2.21 Half kneeling hold of ball.

Exercise strategies that are keys to focusing attention on breath and pelvic muscle control include primary movement patterns that are part of the typical developmental motor sequence. These exercises listed below require fundamental control of joint stability and mobility, and their skilled performance, or limitations, will guide programming. Children may enjoy these exercises and find them to be soothing routines, and they may be practiced as part of a family relax, rest, and stretch group exercise to engender a sense of wellbeing and play.

Yoga asanas (postures) are useful for promoting awareness of breath and relaxation versus tensing of the body, globally, as well as directing attention to the pelvic region. Lying down, face up (supine), initiate instruction and “play” with diaphragm breathing, rocking knees side to side, hip bridging, and pulling single, and then double knees to chest, with cues to notice hips, and easy breathing. Next, with both knees to chest, opening the knees and relaxing inner thighs and pelvic muscles, cuing to “relax the bottom.” In quadruped, anterior–posterior rocking, to cat camel, to child’s pose, to a press up. This may be followed by kneeling to squatting and standing. Crawling, bear crawls, catching and tossing balls, or squeezing a ball between the knees may be used for cuing muscle coordination. Pediatric pelvic health and dysfunction may benefit from multiple forms of treatment as portrayed in this chapter (Boxes 2.17 and 2.18).

### Box 2.17 Pediatric pelvic therapy for constipation and encopresis

Jaquelyn received 12 physical therapy (PT) sessions over the course of 8 months, with once weekly for the first 6 weeks and tapering to once a month for the later visits. She used a tracking log and indicated Bristol stool type and bladder and bowel leaks. Her program included a strict, slow tapering of her laxative, and the addition of a few vegetable and fruit items to her diet, and increased hydration to 25–30 ounces per day. On advice, she stopped eating the “binding” foods of bananas and rice, and limited her bread intake. Manual therapy treated limitations in mobility of the rib, diaphragm, abdominal, gluteal, and colon areas, with education for parents to provide the similar massage if all parties were able and interested. Pelvic floor training for synergy used ultrasound and external biofeedback. Mat and stability ball exercises were instructed, emphasizing comfort, relaxation, and flow, and also light PFM tensing and relaxing. She enjoyed learning to use a stability ball for her pelvic health, and it felt somewhat similar to gymnastics she had begun prior to her pelvic health problems. She exhibited an improved affect as her pelvic health improved, with smiling and eye contact with her therapist during discussions and review of her monthly tracking log. She was able to return to dance and gymnastics class as well as the completion of the therapy.

### Box 2.18 Medical management

Medical management requires adherence to behavioral interventions as listed above, as well as supplement use as needed, such as laxatives and stimulants and possibly suppositories and enemas. Emerging research points to the gut microbiome in pelvic health, yet this is not yet mainstream care. The MOP book (Hodges and Schlosberg 2018) discusses the “bottom up” approach to constipation with enema therapy, in addition to “top down” strategies that rely on fluid, fiber, and behavioral/nutrition management. Enemas may seem like drastic measures, but in the case of a chronically overstretched colon, signaling for a sense of fullness will not occur until the colon shrinks over the course of months and up to a year. Enemas may be traumatizing, and there are specialty seminars for pediatric pelvic health for providers needing introductory to advanced rehabilitation training and mentorship (Sandalcidi 2018).

In summary, pelvic health conditions in pediatrics are relatively common, and conservative care therapy can be composed of simple elements that create healthy habits, and allow the child to participate in family life, school, recreational, and community activities. Programs can be designed for fun and empowerment towards self-awareness and self-care. Child program cooperation, patience, and perseverance from parents, teachers, and all providers are required to overcome frustration and repeated challenges.

## REFERENCES

- Benchimol, E., Turner, D., Mann, E. H., Thomas, K. E., *et al.* (2008) “Inflammatory bowel disease; clinical and radiographic characteristics.” *The American Journal of Gastroenterology* 103, 6, 1524–1531.
- Benninga, M., David, C., Catto-Smith, A. G., Clayden, G., *et al.* (2005) “The Paris consensus on childhood constipation terminology (PAACT) group.” *Journal of Pediatric Gastroenterology and Nutrition* 40, 3, 273–275.
- Bordoni, B., Purgol, S., Bizzarri, A., Modica, M., *et al.* (2018) “The influence of breathing on the central nervous system.” *Cureus* 10, 6, e2724.
- Brantberg, A., Blass, H.-G. K., Haugen, S. E., Isaken, C. V., and Elk-Nes, S. H. (2006) “Imperforate anus; a relatively common anomaly rarely diagnosed prenatally.” *Ultrasound in Obstetrics and Gynecology* 28, 7, 904–910.

Table 3.1 PMS and PMDD symptoms

Symptom types	PMS	PMDD
Sleep	Variable	Possible insomnia or hypersomnia
Somatic symptoms	Breast tenderness, headaches, muscle and joint pains, swelling, bloating, weight gain One or two of these symptoms	A few of these symptoms
Affective symptoms	Anxiety, depressed mood, irritability, feelings of overwhelm, concentration difficulties, emotional lability, loss of interest in activity participation, low energy levels, food cravings, over-eating Only a few of these symptoms	A multitude of these symptoms
Functional level at home, community, work	Mild to moderate impairment with the need to limit or stop home, community, and/or work participation during the premenstrual phase	Moderate to severe impairment in home, community, and/or work participation during the premenstrual phase

(Endicott et al. 2006; Hofmeister and Bodden 2012; Pearlstein and Steiner 2012; Robinson and Ismail 2015)

### Dysmenorrhea

Dysmenorrhea, or painful menstruation, occurs in a wide range of females, with incidence rates from 16 percent to 91 percent (Ju, Jones, and Mishra 2014). Dysmenorrhea can include premenstrual symptoms as well as symptoms during menses. Typical symptoms include pain, cramping, nausea, headache, diarrhea, and vomiting. Severe disabling pain is found in 2 percent to 29 percent of women, with activity limitations such as bed rest required, and missing school, work, and other functional roles (see Box 3.3).

Risk factors for dysmenorrhea may include a positive family history of dysmenorrhea, younger age, insufficient exercise, a poor diet, and exposure to life and work stress as precipitating factors. Obesity is an associated risk factor in some but not all research studies. There is a protective effect from regular physical exercise, self-care, nutrition awareness, parturition, and oral contraceptive use (Bavil et al. 2016). Dysmenorrhea is caused by uterine contractility in response to prostaglandin hypersecretion. Dysmenorrhea may be an isolated medical occurrence, or also occur in association with two medical conditions, endometriosis and adenomyosis (Bernardi et al. 2017).

### Box 3.3 Symptom tracking, and considering if care is needed



Do we take cyclical pain complaints seriously, and consider hormone, neurovascular, and endocrine fluctuations in an individual, or write pain off due to “emotional instability”? Teaching teens to track their mood, pain, and menses over a few months can provide insight and patterns in relation to the menstrual cycle, as well as assist therapists with providing care. Validating symptoms and offering programs for wellness can lessen symptom burden.

Menstrual cycle trackers in the form of electronic applications (apps) are widespread in use and may help individuals to identify symptoms and decrease the stigma associated with menstruation. (Symptom burden may be shared with an individual’s health care provider to help with screening and optimizing treatment.) The apps may also be used to track fertility, and as birth control, yet they may not always be accurate and may result in unwanted pregnancies (Earle et al. 2019).

Research validates beneficial self-care skills to help with dysmenorrhea, including the use



of acupuncture, nutrition, the use of heat, and aerobic and/or more gentle and sustainable exercise such as yoga and Pilates (Armour *et al.* 2019). Exercise is one of the key foundations that may lighten the burden of dysmenorrhea, with sample exercises below (Figures 3.1–3.9).

Gentle exercise for PMS and dysmenorrhea, moving in a flow:



Figure 3.1 Knees to chest, supine.



Figure 3.2 Rocking supine, right and left.



Figure 3.3 Posterior glide, rocking in quadruped.



Figure 3.4 Cat camel.



Figure 3.5 Sphinx (partial press up).



Figure 3.6 Press up.



Figure 3.7 Child's pose.



Figure 3.8 Thread the needle.



Figure 3.9 Legs up the wall.

Exercise is promoted for improved health and reduced pain and other symptoms related to PMS and dysmenorrhea (Office on Women's Health 2021).

### Endometriosis and polycystic ovarian syndrome

Endometriosis and polycystic ovarian syndrome (PCOS) conditions are typically not diagnosed until after years of suffering.

Endometriosis is a systemic inflammatory health condition that characteristically includes endometrial (uterine) tissue occurring outside the uterine lining, and dysmenorrhea and infertility are often present (see Box 3.4). This occurs in 10 percent to 15 percent of females in their reproductive years (Agarwal *et al.* 2019; Asghari *et al.* 2018). Endometriosis is present in 30 percent to 45 percent of women with infertility. Sadly, it takes an average of 12 years for women with endometriosis to receive a diagnosis, and pain presentation may be misleading with abdominal, pelvic, bladder, bowel, and even radiating leg pain being present.

### Box 3.4 Endometriosis



Genetics, epigenetics, oxidative stress, inflammatory cytokines, and hormonal influences are all involved in endometriosis disease initiation and progression. Historically, women have received birth control, pain medications, and surgery for endometriosis. Laparoscopic surgery or hysterectomy for endometriosis is common, yet tissue removal does not eradicate the symptoms in all, with a recurrence rate of 3.3–62% (Rizk *et al.* 2013; Soliman *et al.* 2017). The failure of sole surgical treatment points to the need to consider systemic influences that are pro-inflammatory.

The role of oxidative stress, as well as the potential for an anti-inflammatory lifestyle, is being studied in endometriosis, with recent research stating, “Overall, the available literature focuses on the efficacy of antioxidant therapy in the treatment and mitigation of endometriosis” (Vitale *et al.* 2018). Pelvic physical therapy, nutrition, lifestyle coaching, mindfulness, yoga, increasing physical activity, and endometrial excision surgery may dial down the inflammatory processes and provide pain reduction, or even total relief in some cases (Orbuch and Stein 2019).

PCOS is the most common endocrine disorder in women of reproductive age, occurring in 8 percent to 13 percent of women (Teede *et al.* 2018), and undiagnosed in up to 50 percent of females (see Box 3.5). Multiple studies confirm the benefit of lifestyle modification and exercise in PCOS (Harrison *et al.* 2011; Ibanez *et al.* 2017; Woodward *et al.* 2020) in reducing hyperinsulinemia (high blood sugar) and improving insulin sensitivity. However, a recent research review indicates, “45 percent of women with PCOS have reported that they have never been provided information about lifestyle management. This highlights a significant gap in knowledge and is reflective of the lack of evidence-based