Rehabilitating the Pelvic Floor

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Abstract

Dysfunction of the pelvic floor causing incontinence is a common problem among adult Americans. There are multiple causes but the prevalence of a sedentary lifestyle exacerbates the issue. In any other posture besides sitting and lying down overall muscular activity increases, including the pelvic floor, aiding in remaining continent. The Pilates method is a uniquely effective method of treatment due to its focus on recruiting the pelvic floor, abdominal and gluteal muscles as well as correcting overall posture which is crucial to minimizing the stress on the pelvic floor muscles.
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**Anatomical Description**

The pelvis is an extremely intricate and important part of the body, surrounded by a large number of muscles. The bony structure of the pelvis includes the ilium, ischium, pubis, sacrum, and coccyx. These are joined together at various points: the symphysis pubis anteriorly, two sacroiliac joints posteriorly to the left and right of the sacrum, and the sacrococcygeal joint connecting the sacrum and coccyx. All of these allow minimal movement for maximal stability to support the weight of the trunk and upper extremities while standing. Major landmarks of the pelvis which will be discussed later in regards to correct positioning of the pelvis are the anterior superior iliac spine (ASIS) and pubic symphysis (PS).

The pelvis is surrounded by multiple major muscle groups which aid in stability. The pelvic floor supports the inferior portion of the pelvis and will be our main focus. There are three layers of the pelvic floor muscles: layer 1 superficial perineal pouch, layer 2 urogenital diaphragm, and layer 3 pelvic diaphragm. Functionally speaking, we are concerned with the pelvic diaphragm since it is made up of the main musculature:
levator ani and ischiococcygeus. The main functions of the pelvic diaphragm are to support the pelvis, support the internal organs, and fix the trunk during movements of the upper extremity. The muscle fibers are 30% fast twitch and 70% slow twitch which implies that the majority of their function is for stabilization and support.

Other muscles which are important to our study and have direct effect on the pelvis are the transversus abdominis, internal obliques, hip adductors, and gluteals. Transversus abdominis (TrA) is the deepest of the abdominal muscles and wraps horizontally around the torso, attached to the thoracolumbar fascia, lower six ribs, iliac
crest and the inguinal ligament. TrA supports the internal organs and creates lumbopelvic stability in coordination with the pelvic floor muscles, internal obliques, multifidus, and the diaphragm, also known as intra-abdominal pressure (IAP) (DiFiore, 24). The internal obliques lie on top of the TrA and wrap in and up. Their origins are the thoracolumbar fascia, iliac crest and inguinal ligament, inserting upwards toward the lower four ribs and inwards toward its own fascia along the linea alba. Working along with TrA they add to abdominal compression and separately flex the trunk toward the same side. The hip adductors’ importance comes into play as far as adding support to the symphysis pubis which otherwise has no muscular support (DiFiore, 3). This has enormous implications later on when it comes to the exercise program for someone dealing with incontinence. Lastly, there are the gluteal muscles: piriformis, gluteus medius, gluteus minimus, and gluteus maximus. These all provide added stability to the pelvis through “force closure” due to their attachment originating from the sacrum (piriformis) or ilium (gluteals) to the femur (DiFiore, 3).
The Incontinence Epidemic

Incontinence is more prevalent than one would think, especially in the Western cultures where a more sedentary lifestyle is common. The National Association for Continence has found that urinary incontinence affects an average of 25 million adult Americans and is found more often in women than in men, 26% of women between the ages of 18 and 59 experience involuntary leakage, and 50% of nursing home residents suffer from incontinence (Herman & Wallace 2012). There are many underlying causes of incontinence which include but are not limited to strokes, urinary tract infections, neurological disease, surgery within the pelvis, prostate enlargement, chronic constipation, medications, detrusor dysfunction, weakening/damage to the pelvic floor muscles, organ prolapse, raised intra-abdominal pressure, menopause, aging, sedentary lifestyle and hypermobility (Herman & Wallace 2012). Symptoms of organ prolapse and incontinence can include feeling of bulging or protrusion, poor or prolonged urinary stream, feeling of incomplete emptying, leaking with coughing, laughing or sneezing, urinary frequency, urgency, stool staining, pain in the vagina or perineum, or low back pain (Herman & Wallace 2012). It is needless to say that these conditions are extremely humiliating and the client may not initially inform you that they are experiencing these things as it is a very sensitive topic. If they do inform you of their condition, it is best to strongly recommend that they see a physical therapist that specializes in the pelvic floor if they have not already. The reason being that it is highly common that the Kegel is done incorrectly, which is the foundational exercise for improved continence, and the therapists have specialized equipment such as

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biofeedback to aid in correct firing of the pelvic floor muscles. Without doing so, further
and intensive exercise can exacerbate the issue.

Case Study

Judy is a 65 year old retired woman who is currently experiencing small amounts
of urine leakage throughout the day, mostly when doing more intensive activities such
as lifting grocery bags, fast walking, sneezing, coughing or laughing. She is
postmenopausal and has had two pregnancies and vaginal deliveries with minor
tearing. Her job before retirement mainly entailed sitting at a desk and working on a
computer. She occasionally experiences low back pain, typically toward the end of the
day or after having spent time holding and playing with her one-year-old grandson. Judy
began experiencing her symptoms shortly after beginning menopause but did not seek
help until recently. She is currently seeing a physical therapist specializing in the pelvic
floor and was diagnosed with a grade II cystocele (prolapse of the bladder). She has
been cleared to take Pilates via private instruction as a supplement to her current
therapy and the therapist noted no further contraindications beyond those regarding the
weakened pelvic floor. She assumes a hyperlordotic posture when standing and her
current activity level includes walking one to two miles an average of five days a week.

Correct Pelvic Positioning and Recruitment of Muscles

In my sessions with Judy I will keep the main focus on integrating the contraction
of the pelvic floor muscles (Kegel) into every exercise for maximum transfer of
functionality. Our goal is to decrease the amount and frequency of urine leakage during her daily activities and improve posture to significantly reduce the occurrence of back pain. Contraindications for her condition are lifting of the head and chest off the floor (anything in the chest lift position) and anything that puts more pressure on the pelvic floor than it can handle (both legs in tabletop or any exercise involving front support position only if the client experiences onset of symptoms). Before moving into the exercise program, I would like to go over correct firing of the pelvic floor muscles and the importance of intra-abdominal pressure. Correct positioning of the pelvis is essential to create intra-abdominal pressure to support the low back and reduce stress on (as well as strengthen) the pelvic floor muscles (Carriere & Feldt, 72). The spine must be in a neutral position in order to decrease the downward pressure placed on the pelvic floor. Studies have found that if the lumbar spine is in a flexed position when sitting or standing, the weight of the abdomen puts stress directly onto the pelvic floor (Carriere & Feldt, 263). Making the client aware of this and helping them to find neutral spine while lying down, sitting and standing will help them to transfer this knowledge into their daily life and thus help to reduce symptoms. It is also important to note here that studies have shown better engagement of the pelvic floor muscles when the spine is in a neutral or extended position, but not flexed (Carriere & Feldt, 390), which we should be aware of when positioning the client during exercise. The instructor should always be looking to see if the client is unable to keep lumbopelvic stability during every exercise. The biggest indicator for this is a pushing out of the low abdominals, which means the pelvic
IAP is being exerted downward onto the pelvic floor (DiFiore, 52). This should especially be watched for when both legs are in table top as these exercises are more demanding.

Also important to note here is correct engagement of the pelvic floor muscles. Most of this should have been or is being corrected by the physical therapist, but there are some good verbal cues to use and visual indicators of incorrect muscle recruitment. According to Carriere & Feldt, undesirable patterns in attempt to engage the pelvic floor muscles include:

- Contraction of the gluteals, raising of the buttocks, straightening of the pelvis
- Adductor contraction
- Visible tensing of the rectus abdominis, internal and external obliques
- Sharp inspiration with retraction of the abdominal wall, or breath-holding

The easiest pattern to correct is to encourage the client to breathe. Breath holding will strain and push down on the pelvic floor muscles. It is best to exhale during any effort and along with a pelvic floor contraction (Herman & Wallace 2012). If the client is having trouble maintaining the Kegel, it is best to have them work in supine so that there is no gravity or pressure working against the pelvic floor and then progressing to working in upright positioning (Carriere & Feldt, 389). Good cueing for instructing pelvic floor contractions include using elevator imagery, “close the openings and lift the floor”, “stop the flow”, “hold back the gas”, “bring the sits bones together”, “tailbone to your pubic bone”, “lift your perineum off the chair” (Herman & Wallace 2012). Once correct contraction of the pelvic floor is established, integrating use of the the hip adductors, gluteals, and abdominals facilitate synergistic contraction of the pelvic floor muscles (Herman & Wallace 2012).
The Exercise Program

Integrating functional movement patterns into the exercise routine is key to significant improvement of the client’s condition. It is commonly believed that doing exercises in a wide leg positioning should be avoided, but what if they cough while walking up the stairs or sneeze while squatting to pick up a box? We need to help train them to contract the pelvic floor muscles in any leg position (Gabelsberg 2016). When working in a wide leg position, cueing contraction of the pelvic floor along with TrA should be emphasized along with an exhale to discourage breath holding (Herman & Wallace 2012). When working with both legs in tabletop, it may be best to start by adding the assist of supporting the feet with a swiss ball then progressing to holding a ball between the knees so the hip adductors can increase pelvic stability. Another helpful assist for prolapse is eliminating gravity from the pelvic floor completely by bringing the hips into an elevated position (Herman & Wallace 2012). This can be done using a wedge, ball, or step barrel. Doing exercises sitting on a swiss ball is another great way to help the pelvic floor to contract and teaches correct patterning (Carriere & Feldt, 20).

<table>
<thead>
<tr>
<th>BASI Block</th>
<th>Exercise(s)</th>
<th>Additional Comments</th>
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</thead>
<tbody>
<tr>
<td>Warm Up</td>
<td>Roll Down, adductor squeezes with ball in between knees and pelvic floor contraction, pelvic curl with ball in between knees, leg lifts, spine twist supine with swiss ball supporting feet</td>
<td>All these exercises focus around awareness of the PFM and prepare the client to engage PFM with all movements</td>
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<td></td>
<td></td>
<td>Seated positioning adds functionality, cue lifting of the PFM off of the seat</td>
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<tr>
<td>Footwork</td>
<td>Wunda Chair</td>
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<tr>
<td>Abdominal Work</td>
<td>Bottom lift w/ RUB</td>
<td>Eliminates gravitational pull on PFM</td>
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<tr>
<td>Hip Work</td>
<td>Supine leg series on Cadillac</td>
<td>Requires focus on pelvic lumbar stabilization, extra cueing of PFM contraction with exhale</td>
</tr>
<tr>
<td>Spinal Articulation</td>
<td>Bottom lift, bottom lift with extensions</td>
<td>Eliminates gravitational pull on PFM</td>
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<tr>
<td>Stretches</td>
<td>Standing lunge</td>
<td>Cue PFM contraction w/ every exhale</td>
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<tr>
<td>Full Body Integration (F/I)</td>
<td>Flat back knee stretch, Up stretch 1</td>
<td>Flat back keeps pelvis in neutral for maximal PFM contraction, up stretch eliminates gravitational pull</td>
</tr>
<tr>
<td>Arm Work</td>
<td>Arms standing series</td>
<td>Good for functionality, extra cueing of PFM with exhale</td>
</tr>
<tr>
<td>Leg Work</td>
<td>Squats</td>
<td>Good for functionality, cue PFM lifting when going down in the squat, then contracting more with the exhale to straighten knees</td>
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<tr>
<td>Lateral Flexion/Rotation</td>
<td>Mermaid</td>
<td>Cue lifting of PFM and encourage breathing throughout</td>
</tr>
<tr>
<td>Back Extension</td>
<td>Breaststroke prep</td>
<td></td>
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<tr>
<td>Cool Down</td>
<td>Roll down</td>
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**Conclusion**

This program should significantly decrease the frequency and amount of urinary leakage during the client’s daily activities through the specific focus on recruitment of the pelvic floor muscles through all movement. It should also help to relieve the stress...
directed into her low back by correcting postural deviances and strengthening the muscles surrounding the pelvic girdle. Incontinence is an issue that unfortunately many adult Americans face, but with the help of specialized physical therapy for the pelvic floor and the employment of a safe yet effective Pilates program, it should be an issue that is easily remedied.
Bibliography


Gabelsberg, Jennifer, DPT. Personal interview. 16 September 2016.