Pilates for the treatment of Postural Hyper-Kyphosis
Summary

It’s widely agreed that most of us could benefit from moving more and sitting less. In modern life as growing hours of our daily tasks and work life are performed whilst seated, it is no surprise, that without close attention, our muscles and subsequently posture suffer from these unnatural levels of inactivity. According to the British Heart Foundation, adults of working age in England average about 9.5 hours per day of sedentary time. Between the ages of 65 and 74, sedentary time in both men and women increases to 10 hours per day or more. By age 75+, people are sedentary for 11 hours per day.¹

Kyphosis; a postural disorder characterised by an increased curvature and flexion of the thoracic spine (hunch back) and often accompanied by hyperextension of the cervical spine (forward head) and lumbar hyperlordosis. In this paper, I will illustrate how I prescribed a BASI pilates program to a 72 year old female client, suffering from postural Kyphosis, a result from a career at a desk.

¹ British Heart Foundation 'Heart Matters Magazine', https://www.bhf.org.uk/heart-matters-magazine/activity/sitting-down
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Anatomical Description of Trunk and Vertebral Column

The Spine is also known as the vertebral column and is made up of 33 moving bones called vertebrae. These stack on one another to provide the main support for the human body to stand and move. The spine is highly mobile, allowing for multidirectional movements of the trunk. The vertebrae are arranged in 5 regions; Cervical, Thoracic, Lumbar, Sacral and Coccygeal. When viewed from the side, the spine is not straight- instead each region is curved in an anterior/posterior direction. These curvatures play vital roles in the movement and force absorption of the spine and body.

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2 Devisions of the vertebral column, http://biology-forums.com/index.php?action=gallery;sa=view;id=8787
Muscles of the Upper Extremities

Figure 2. Upper extremities, anterior view. ⁴

Anterior view: The shoulder joint is a ball and socket joint which is highly mobile. It can achieve a very high range of motion in multiple planes. The anterior deltoid and clavicular (upper) portions of the pectoralis major are the primary muscles in shoulder flexion, internal rotation and horizontal adduction, whilst coracobrachialis assist as secondary muscles in shoulder flexion and horizontal adduction. The sternal section of the pectoralis major can produce internal notion and horizontal adduction, shoulder and some variances of shoulder flexion. ⁵

⁴ Rael Isacowitz and Karen Clippenger, Pilates Anatomy, pg 38, (2011 IL, USA)
⁵ Rael Isacowitz and Karen Clippenger, Pilates Anatomy, pp 38,39 (IL, USA 2011)
Muscles of the Upper Extremities

Figure 3. Upper extremities, posterior view

**Posterior view:** The posterior deltoid, latissimus dorsi and teres major can perform shoulder extension as well as horizontal abduction. The posterior deltoid has the job of shoulder external rotation whilst latissimus doors and teres major traverse to attach to the front of the humerus action the shoulder to internally rate. Muscles from the front of the shoulder co-contract with muscles from the back to achieve shoulder adduction. One of the major muscle pairs in the upper extremities are the pectoralis major and latissimus dorsi which are commonly used for shoulder extension, often with the assistance of other smaller pairs of muscles. Other muscles which aid movement of the shoulder include the rotator cuff and scapular muscles. The rotator cuff consist of four small muscles which cross between the scapular and upper humerus, the muscles work to stabilise the shoulder joint.

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Scapular muscles produce movements of the scapular and are linked to movement of the shoulder. Located on the back of the body, the trapezius and rhomboids act to pull the scapular towards the spine in scapular adduction, whilst those on front, the serrates anterior and pectorals minor produce scapular abduction. Levator scapulae, upper trapezius and rhomboids are the muscles which run from the scapular upwards, attaching to the neck or upper back and are responsible for scapular elevation. Scapular depression is produced by the lower trapezius, lower fibres of the serrates anterior and pectoralis minor.\textsuperscript{7}

\textsuperscript{7} Rael Isacowitz and Karen Clippenger, \textit{Pilates Anatomy}, pp 38,39 (IL, USA 2011)
Introduction

Hyperkyphosis can be identified when the normal curve in your thoracic vertebrae is curved (flexion) more than usual. Also described as rounded back, hunch or hump back. This excessive forward curvature of the thoracic spine is often matched by the reverse curvature (hyperlordosis) or (sway) of the cervical (neck) and lumbar (lower back).

Postural Kyphosis: Caused by prolonged poor posture, such as slouching, hunching or leaning back in a chair for long periods of time and can be quite common among desk workers and people who spend long amounts of time in a hunched over position such as hairdressers and beauticians.

Scheuermann’s Kyphosis: Is due to the underdevelopment of vertebrae, which are left misaligned

Congenital Kyphosis: When two or more vertebrae fuse together during the foetal development in the womb.

Age and osteoporosis can also contribute to the onset of kyphosis.⁸

Kyphotic Posture

Head: Forward.

Cervical Spine: Hyperextended.

Scapulae: Abducted

Thoracic spine: Increased flexion.

Lumbar spine: Hyper extended (lordosis).

Pelvis: Anterior tilt.

Hip Joints: Flexed.

Knee joints: Slightly hyper extended.

Ankle joints: Slight Plantar flexion due to backward inclination of leg.

Elongated and Weak: Neck flexors, back erector spine, external oblique. Hamstrings may be slightly elongated but not always weak.

Short and Strong:
Neck extensors and Hip flexors. ⁹

Figure no.4 ¹⁰

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Case Study

**Name:** Janet Freeman  **Sex:** Female  **Age:** 72 years  **Location:** London

**Profession:** Janet made her career in books, working in libraries and she has spent many years in front of a computer or desk in a hunched position. She still helps to run a rare book business from home and spends on average 5-6 hours a day in front of the computer in addition to 5-6 hours sat reading or watching television.

**Exercise history:** Janet is low-moderate active client who has been suffering from a hunched back for 10-15 years. In the past couple of years she has struggled with back and shoulder tightness, pain and spasms around her thoracic spine which have stopped her from laying on her back for a number of years. Janet loves walking and makes a point of running errands by foot, often accumulating 7,000-8,000 steps per day. Has never done any pilates classes but has a good level of base fitness.

**Goals** Janet would love to get to be able to lay or sleep comfortably on her back without it resulting in spasms as well as reduce her forward hunched posture and rounded upper back.

**Program frequency:** 12 week program

**Sessions:** 2-3 sessions per week at home on mat in addition to her gym training session

**Limitations:** Because Janet cares for her husband at home, for the time being she will be restricted to pilates training at her home, with the aim to find some home help so that she can eventually attend equipment classes
**Objectives:** Resetting neurological movement patterns in Janet’s body, strengthen back extensors and creating more mobility through the thoracic vertebral segments that are fixated and moving sub-optimally. To correct the degree hyper-kyphosis in Janet’s thoracic spine and hyperlordis of cervical spine. Increasing flexibility in her hip flexors, hamstrings and calves and strength in her spinal extensors. Increase awareness of posture and negative movement patterns.

**Janet’s BASI conditioning program**

<table>
<thead>
<tr>
<th>Block</th>
<th>Week 1-3</th>
<th>Week 3-6</th>
<th>Week 6-9</th>
<th>Week 9-12</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Foundation</strong></td>
<td>Roll Down Pelvic Curl Spine Twist Supine Chest Lift/ With Rotation Leg lifts/ changes</td>
<td>Roll Down Pelvic Curl Spine Twist Supine Chest Lift/ With Rotation Leg lifts/ changes</td>
<td>Roll Down Pelvic Curl Spine Twist Supine Chest Lift/ With Rotation Leg lifts/ changes</td>
<td>Roll Down Pelvic Curl Spine Twist Supine Chest Lift/ With Rotation Leg lifts/ changes</td>
</tr>
<tr>
<td><strong>Abdominal Work</strong></td>
<td>Leg Circles Hundred Prep Roll Up</td>
<td>Leg circles Hundred Prep Hundreds Roll Up</td>
<td>Leg circles Hundred Prep Hundreds Roll Up</td>
<td>Teaser Prep Hundreds Roll Up Double Leg Stretch Single Leg Stretch</td>
</tr>
<tr>
<td><strong>Spinal Articulation</strong></td>
<td>Spine Stretch Spine Twist</td>
<td>Spine Stretch Spine Twist</td>
<td>Spine Stretch Spine Twist Saw</td>
<td>Spine Stretch Spine Twist Saw</td>
</tr>
<tr>
<td><strong>Bridging</strong></td>
<td>Front Support</td>
<td>Front Support Back Support</td>
<td>Shoulder Bridge Prep Back Support</td>
<td>Back Support Shoulder Bridge Prep Leg Pull Front</td>
</tr>
<tr>
<td><strong>Lateral Flexion/ Rotation</strong></td>
<td>Side Lifts</td>
<td>Side Lifts</td>
<td>Side Lifts Corkscrew</td>
<td>Side Lifts Side Kick</td>
</tr>
<tr>
<td><strong>Back Extension</strong></td>
<td>Back Extension Single leg Kick Cat stretch</td>
<td>Back Extension Single leg Kick Cat stretch</td>
<td>Back Extension Double leg Kick</td>
<td>Double leg Swimming Rocking prep</td>
</tr>
<tr>
<td><strong>Foundation</strong></td>
<td>Rest Position Roll Down</td>
<td>Rest Position Roll Down</td>
<td>Rest Position Roll Down</td>
<td>Rest Position Roll Down</td>
</tr>
</tbody>
</table>
Notes:

Janet will follow a 12 week progressive BASI Block program\(^{11}\) which will work her body holistically whilst focusing on particular strengthening and movement work (thoracic extension and spinal rotation), highlighted in blue, which specifically addresses her Kyphosis. As Janet has been a client of mine in the gym for the past 4 years, I have included some intermediate exercises where appropriate to ensure she remains consistently challenged throughout the course of the 12 weeks.

Conclusion

Within the first two sessions, Janet had sustained 30 minutes on her back throughout the course of the session, something which she has not achieved for over 8 years. This enabled Janet to relax a bit and not be so tense and hesitant about trying particular exercises/ positions which she feared would send her back into spasm. Janet is a worrier by nature and I believe that as she becomes a little more trusting and relaxed about being in the supine position, the more her back will relax and less it will spasm in doing so. By the end of her third week, Janet had successfully completed a full session from start to finish, without the need of excessive rest between exercises. She reported early benefits such as increased mobility and movement through the thoracic spine, trapezius and neck. An added bonus was she also mentioned she had developed an increased awareness of how much time she spends seated and of her posture whilst being seated.

Janet's flexion of her thoracic spine would appear, very subtly reduced, with her noticeably standing a little taller and upright. Her mobility whilst performing spinal

\(^{11}\) Rael,Isacowitz, *Study Guide, Comprehensive Course*, pg 36, (Costa Mesa 2013)
articulation and extension exercises has visibly improved. I feel confident that by the
day of week twelve, we would have continued to see positive results with the
correction of her thoracic spinal flexion, thoracic mobility head retracting closer to
plumb line.
Bibliography

Book:


Website:


