

## **Postural restoration**

Kyndall Boyle (PT, PhD, OCS), Assistant Professor at Elon University, USA, explains postural restoration—a holistic approach to the management of postural patterns of asymmetry.

Two Olympic curlers with lumbar-pelvic injuries (a pulled hamstring and an iliotibial band injury) almost see their dream disappear, but are able to compete successfully. Two patients with low back pain almost undergo surgery, but cancel it. Two patients with sciatica and fatigue are considering an injection, but never get one and regain their energy. Two collegiate volleyball players have low back pain that goes away when they correct their breathing with exercise. What did these patients have in common? They all received physical therapy, and were treated by physical therapists across the United States who recognised that the patients had a postural pattern of asymmetry. These therapists then prescribed specific therapeutic exercises, and in some cases performed manual therapy on the trunk to reposition and retrain the body to oppose the pattern of asymmetry. This pattern is similar to the Right Handed Pattern described by Florence Kendall; however, it is believed to manifest in all people to some degree regardless of hand dominance. This approach to physical therapy management is called postural restoration (PR).

### ***History***

PR has been developed over 27 years by a physical therapist clinician from Lincoln, Nebraska in the United States named Ron Hruska (MPA, PT). In 1999, after many years of seeking answers to clinical questions in the literature—where answers did not exist—Hruska, along with co-workers, decided to found the Postural Restoration Institute™ (PRI) to provide an avenue to address the unknown. The mission of the PRI is to explore and explain the science of postural adaptations, asymmetrical patterns and the influence of polyarticular muscle chains on the human body. Individuals associated with the PRI are dedicated to clinical education, research and the ongoing search for improved pathways of physical medicine.

The PRI has a website ([www.posturalrestoration.com](http://www.posturalrestoration.com)) which includes a reference list of published literature that is applied to patient management by clinicians trained in PR, and a dissertation that describes the concepts underlying PR. The PRI offers five continuing education courses: (i) Postural Respiration, (ii) Myokinematic Restoration, (iii) Impingement/Instability, (iv) Cervical-Cranio-Mandibular Restoration, and (v) Advanced Integration. The courses are two days long except for the Advanced Integration, which is four days.

The PRI developed an annual certification process in December 2004 because Hruska and other physical therapists felt a need to provide a structure and network for clinicians to continue the integration and development of the dynamic science/technology of PR. There are currently 15 physical therapists representing seven states in the United States who are certified in PR. They use the designation PRC, for postural restoration certified.

## **Overview**

PR is a holistic, posture-based approach to management of patients, which considers the influence of the skeleton, muscles and dental occlusion on posture. It also considers the influence of multiple systems on posture such as the respiratory, nervous (autonomic, central and peripheral), musculoskeletal, oral motor, circulatory, reproductive, digestive, immune and sensory (auditory, proprioception, visual, vestibular). PR is practised by physical therapists, physical therapy assistants and athletic trainers. These clinicians have shared findings, beliefs and concepts that guide and direct many aspects of patient management. Examinations are performed to assess postural alignment reflected in three planes simultaneously, to determine the position of the body, and whether or not pathology exists as a result of compensation.

The focus of PR is on restoring faulty posture (or pathomechanics) believed to be a cause of complaints toward normal, rather than directing interventions toward the painful extremity or region of complaints. The position and function of the pelvis, diaphragm and ribcage are vital components of PR. Pelvic position is almost always restored first. The clinician's goals are often to decrease unwanted hypertonicity via muscle inhibition to facilitate muscle balance, so certain muscles don't have to be so

active, such as hip flexors, paraspinals and/or tensor fascia latae. Muscle balance or repositioning will also enable certain muscles to be in a better position to work so they are also in a better position to rest. This is often accomplished via muscle activation of specific muscles on a specific side of the body, such as hamstrings, gluteus medius and/or gluteus maximus.

Examinations are used by clinicians trained in PR to assess triplanar position of the body, and to determine if there is any soft tissue/bony pathology as a result of compensation. The results of the exam then guide intervention choices such as specific non-manual techniques, manual techniques, external equipment and/or patient education if needed, to reposition the body (i.e. bones and associated soft tissue) towards neutral, improve respiration, and then to retrain the body to be able to maintain the position and breathe correctly. The terminology ‘non-manual techniques’ refer to specific processes incorporating muscle position, the two respiration phases, and appropriate concomitant muscle activity. These processes facilitate isolated muscle activation, muscle inhibition, or integrate desired neuromotor function while preventing compensation.

PR interventions—which include approximately 350 manual and non-manual techniques (exercises), external supports, and patient education—are usually performed to achieve specific results that are different for the right side of the body than they are for the left side. Manual techniques performed on the anterior and posterior trunk are often followed by moist heat to the anterior chest and posterior back to facilitate increased mobility of the ribcage. Active non-manual techniques are usually used first before performing manual techniques. Occasionally techniques are done bilaterally. The techniques are very specific and sophisticated and require patient instruction with explicit details so that desired results can be achieved. Patient education and activity modification is frequently offered so that the asymmetrical postural pattern will be opposed through conscious positioning throughout a 24-hour day.

An example of a non-manual technique (exercise) used to restore position, activate and inhibit muscle and improve breathing is the 90/90 hemibridge with a balloon blow (Figure 1). This exercise activates some muscles (abdominals, hamstrings, adductors, diaphragm and transverse thoracis) and inhibits others (hip flexors and

paraspinals). Hamstring activation will help the pelvis to move from an anteriorly tilted position (hip flexion) back toward neutral (hip extension). The forced exhalation through the balloon activates abdominals (spine flexion) and transverse thoracis (rib depression) and reciprocally inhibits paraspinals (spine extension). After the end of the exhalation phase, with the back pressure in the balloon and the abdominals engaged to provide opposition to the diaphragm, the next inhalation phase is designed to help open up the apical chest wall, from air breathed into the lungs. When ribs are depressed with exhalation, and remain so to some degree with inhalation, the ideal zone of apposition (ZOA) of the diaphragm is maintained. The ZOA is the term for the area of the diaphragm that directly apposes the rib cage (Figure 2). Research has shown that the ZOA is critically important for ideal respiration, exercise tolerance and endurance. When ribs are elevated and lungs are hyperinflated, respiration is compromised and a person can become short of breath, fatigued and have compromised exercise tolerance.

Repositioning techniques such as the 90/90 balloon blow exercise are often done twice a day and are usually recommended prior to a recreational activity or sport. All techniques incorporate a respiration component to them, an exhalation followed by an inhalation phase. This reflects the value and focus of respiration as the cornerstone of PR. All the techniques have face validity, just as a quadriceps set has face validity for recruiting quadriceps muscles, or a passive straight leg raise position for lengthening hamstrings. All the techniques reflect a thorough application of basic science, particularly anatomy, biomechanics, physiology and motor control. Literature evidence supporting the basic science knowledge and didactic anatomy, biomechanics, physiology and motor control have been used by Hruska for the creative development of the techniques for repositioning, altering or restoring position/posture and retraining or maintaining it.

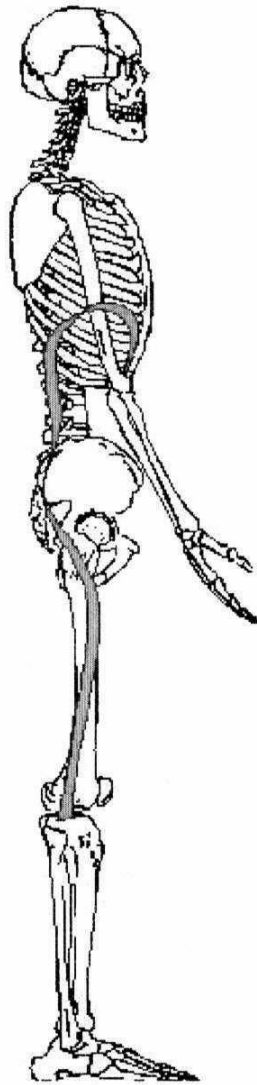
The typical range for the duration of an episode of physical therapy care using PR is 2–15 visits, with an average of seven. Follow-up visits typically occur once every two weeks and last about an hour. Physical therapists trained in PR expect noticeable results in at least four visits, which may include a favourable change in examination tests and measures, functional limitations, and/or disabilities and/or patient satisfaction. Most patients can feel a difference in their bodies very quickly, if not immediately, and are therefore motivated to be adherent to a home program.

If a patient does not achieve noticeable results quickly, the therapist will refer the patient back to a physician for possible diagnostic imaging and/or surgery. Referrals also occur between the physical therapist and other health practitioners such as neuro-optometrists, dentists and podiatrists. These interdisciplinary relationships are based on the recognition and belief of PRC Physical Therapists in the relationship between posture and teeth, between posture and feet, and between posture and vision.

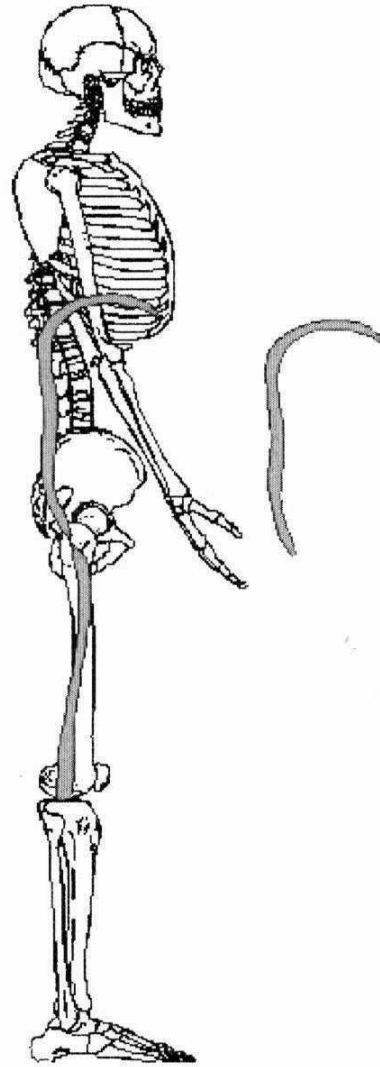
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Figure 1: 90/90 bridge with balloon.



Optimal ZOA



Sub-Optimal ZOA

Figure 2: Sagittal view showing optimal posture with an optimal zone of apposition (ZOA), and sub-optimal or faulty posture with a decreased zone of apposition.