



Peyow Aqua Pilates Case Studies: Changes in Dynamic Balance Measurements within Participants with Physical Disabilities.



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Introduction/Background /Objectives:

The purpose of the study was to determine the effect of Peyow Aqua Pilates exercises on land-based static and dynamic balance for participants with disabilities and chronic conditions.

Data & Methods:

The pilot group were participants at the Rehabilitation Institute of Chicago, medically cleared for group aquatics and independently able to enter/exit the pool. Four standardized tests were administered from Aug 2012 – Jan 2015 on 40 subjects. Classes consisted of 1 class per week, 45 min. duration in a warm water therapy pool (90°F), 4.5'-5.0' in depth. Subjects were tested at week 1, and every 11 weeks following. Seven case studies were chosen for presentation with ages ranging from 52-75; these participants presented with arthritis, lupus, fibromyalgia, lymphedema, spinal stenosis, multiple sclerosis, and lumbar fusion. These participants attended over 17 classes, within two consecutive 11 week series, without major surgery, hospitalization or illness. Participants missing more than 4 consecutive weeks were not included. Each individual was tested in the following ways:

The Forward Functional Reach Test

Quick screen for determining fall risk in older adults

The Forward Functional Reach Test was taken 3 times, averaging the 2nd and 3rd attempt together to produce the final number.

Subjects start position was standing vertical with arms extended to the front, at the zero mark of a wall-mounted measuring tape. They bent forward at the hips and reached out along the wall as far as possible.

Test Criteria: >10 in. =1

6-10in = 2

<6 = 4.02X

Unable to reach = 8.07

The Single Leg Stance Test

Single leg assessment of standing balance

The Single Leg Stance was a timed stance of 30 seconds. For the single leg stance, the subject stood on one leg of their choice.

Test Criteria: Cut point of < 10 sec. = balance impairment, < 5 = fall risk

The Tandem Leg Stance Test

Assessment for static balance with narrow base of support

The Tandem Leg Stance was a timed stance of 30 seconds. For the tandem leg stance, the subject placed one foot with the heel touching the toe of the second leg, choosing which leg was forward. On both leg tests, if they touched the wall or the floor or fell out of balance the timing would stop.

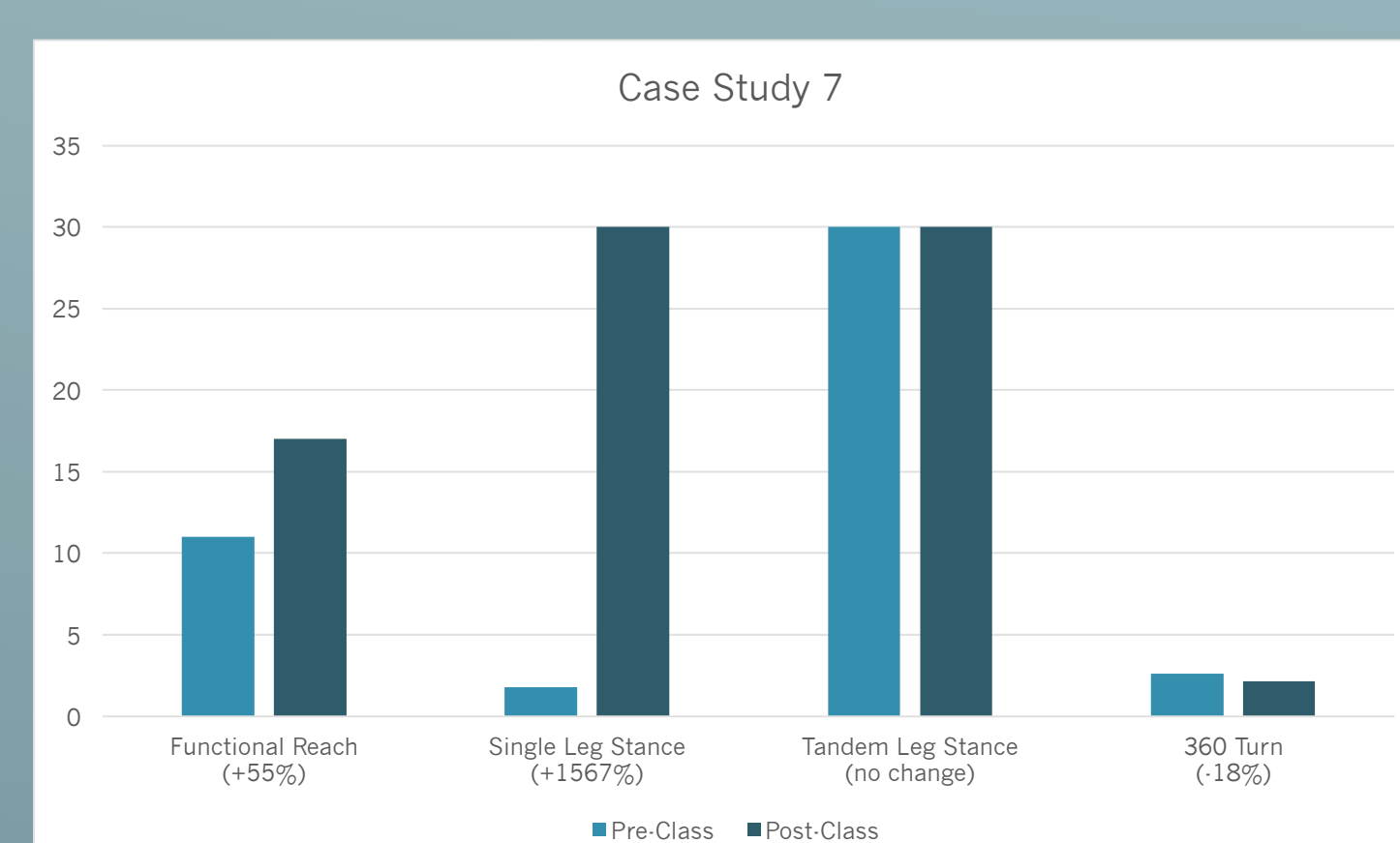
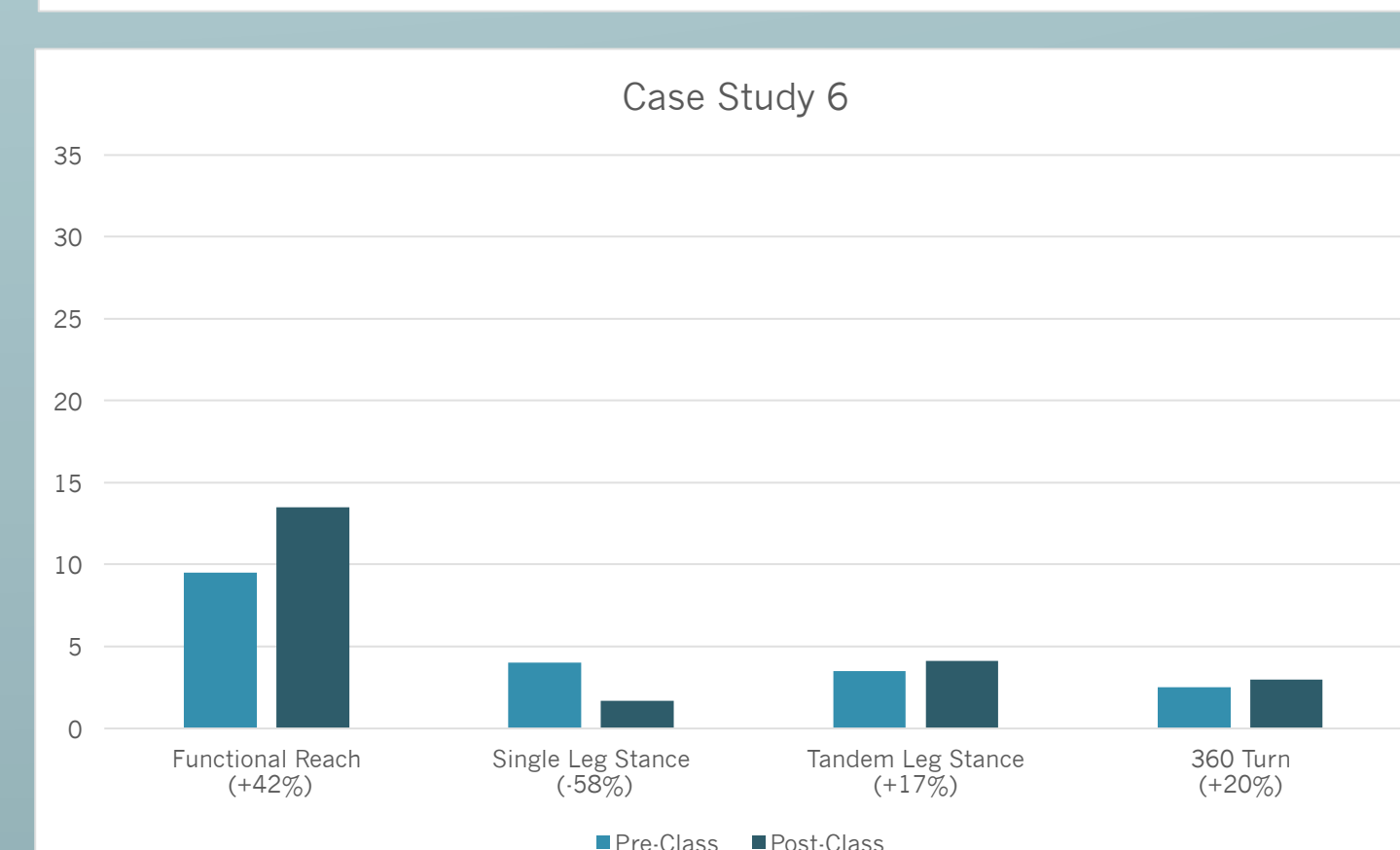
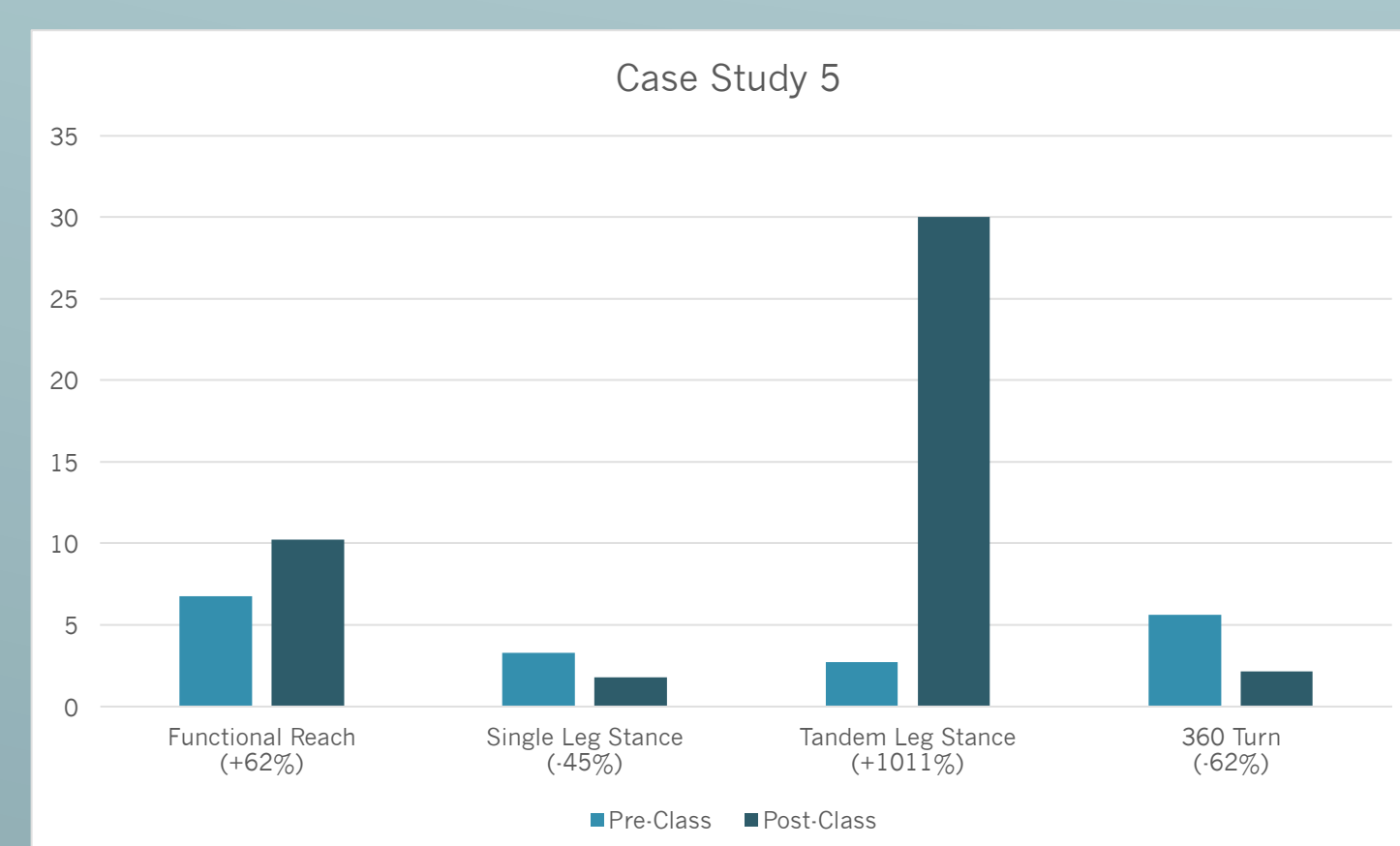
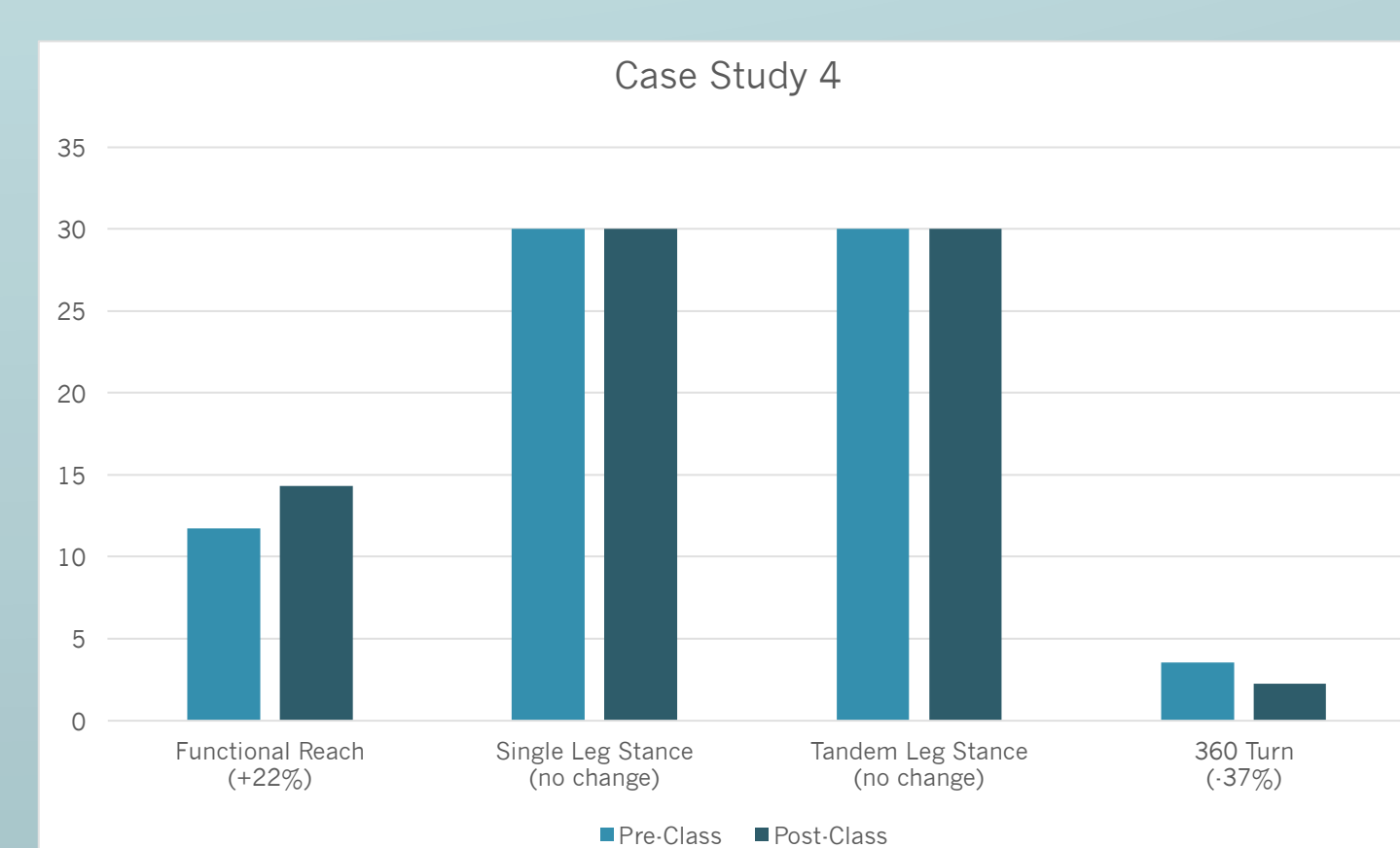
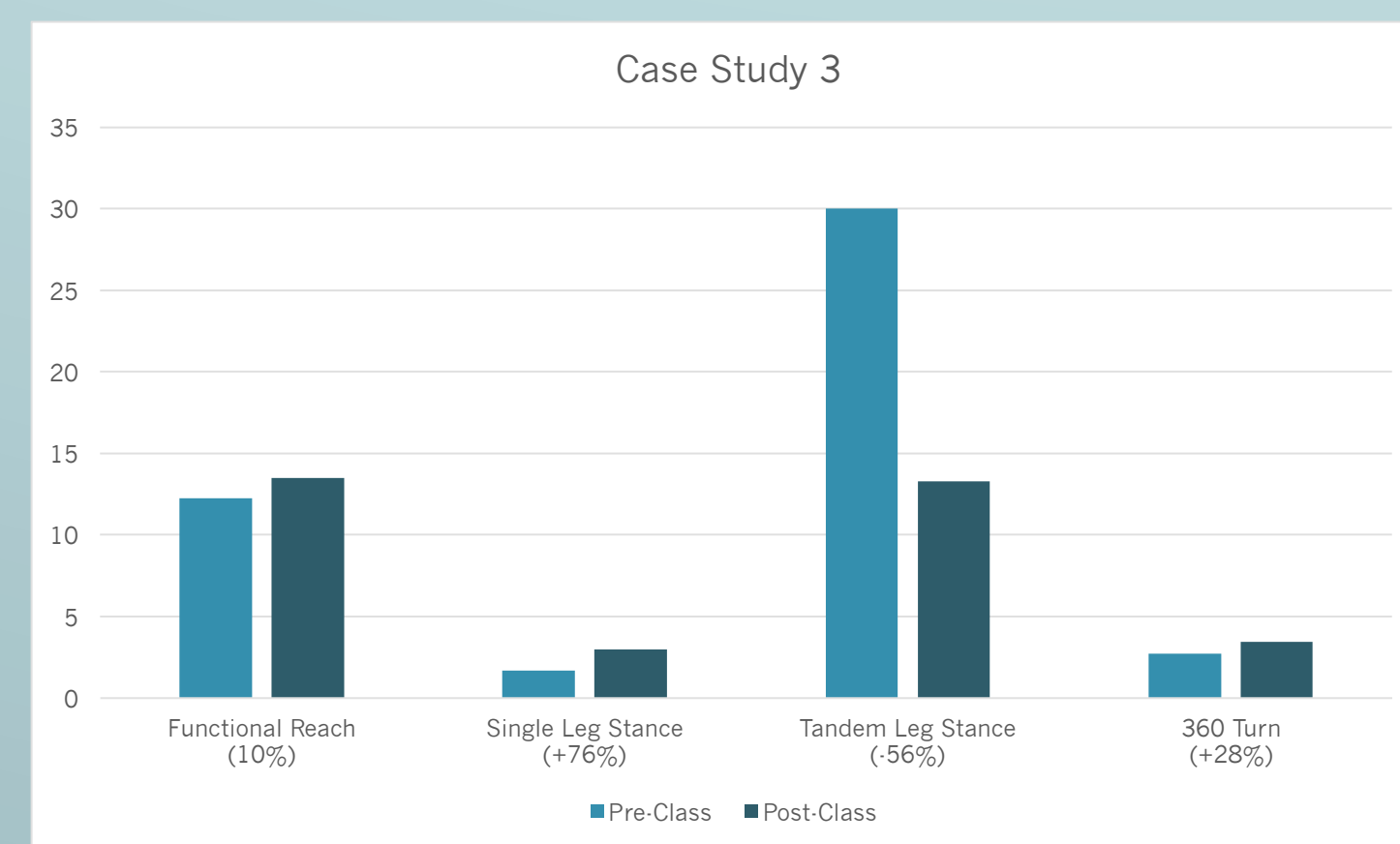
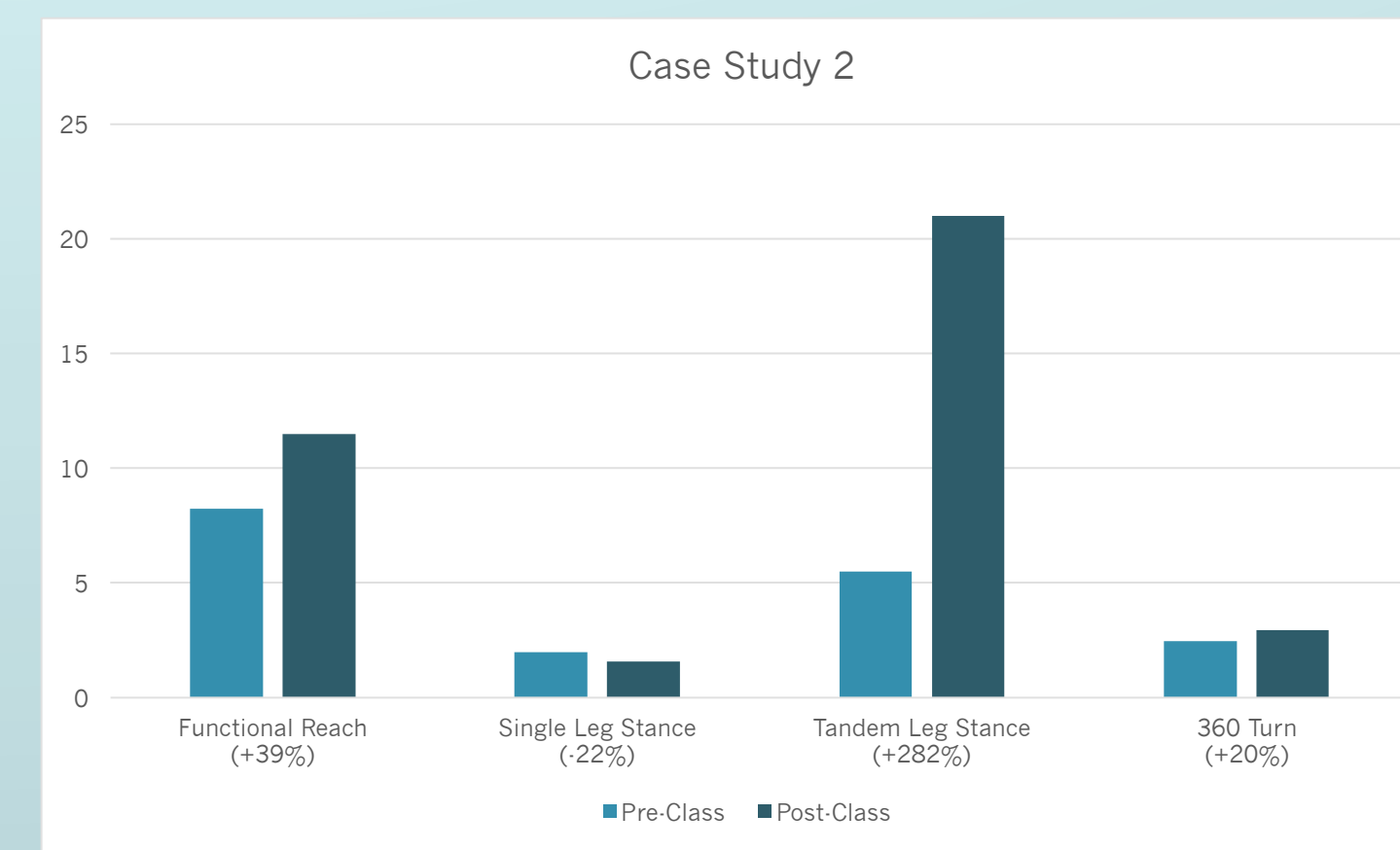
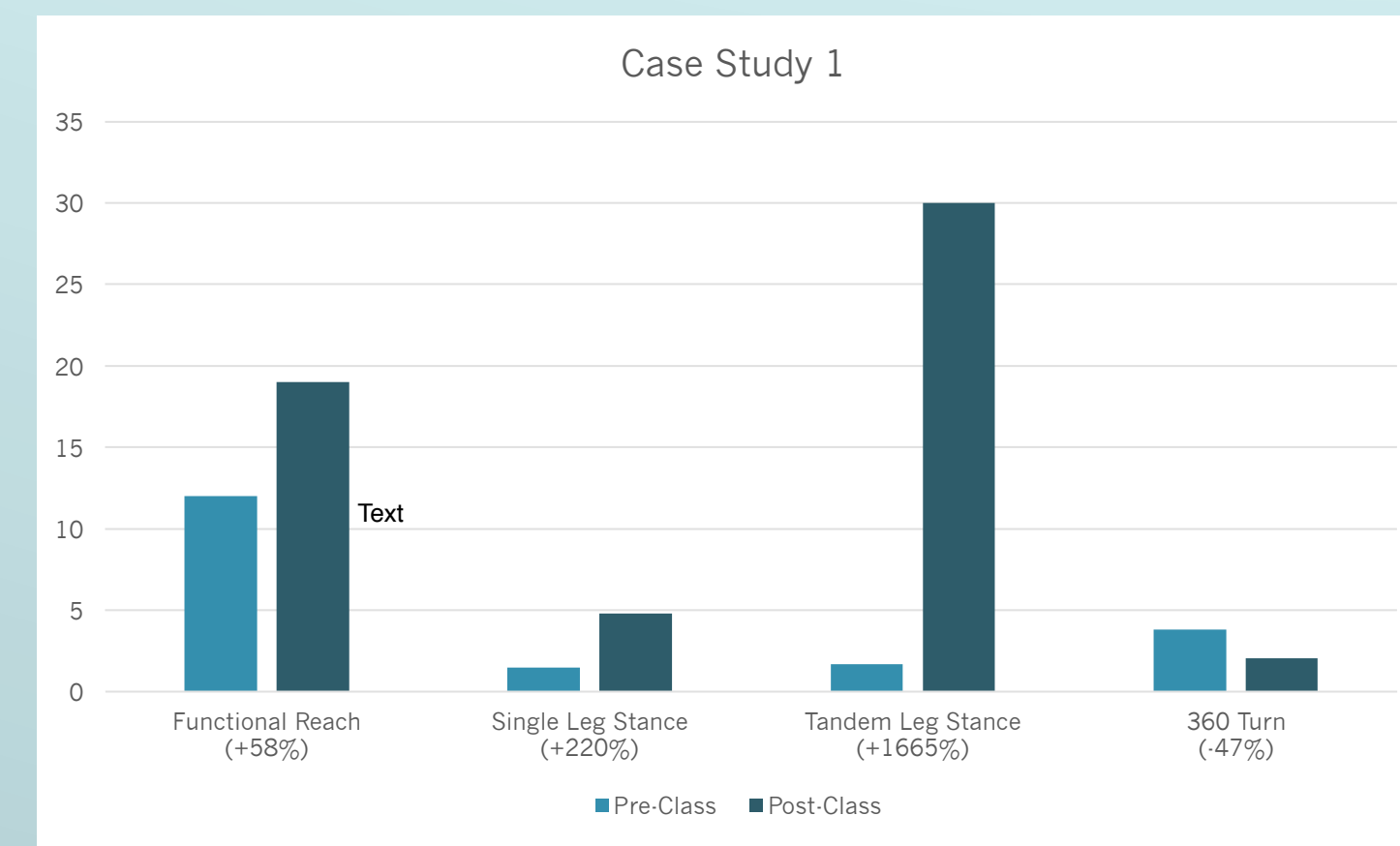
Test Criteria: Cut Point of < 10 = fall risk

The 360 Degree Turn Protocol Test

Standard assessment of dynamic balance

The 360 Degree Turn Protocol was timed twice. Subject was told to turn around once as fast as they could and stop at the same point. This was done twice averaging the data.

Test Criteria: Cut point of >3.8 indicator of fall risk



Conclusion & Implications:

All the participants displayed 10%-62% increases in Forward Frontal Reach Test measurements, and at the end of the study each participant could reach past the cut point of 10 inches, indicating core strength, and dynamic balance.

The static balance tests: Single Leg Stance and Tandem Leg Stance elicited mixed results. Participants using walkers or canes, demonstrated better results on the Tandem Leg Stance balance test. The cut point for fall risk in the Single Leg Stance is less than 5 seconds. Based on test criteria, 5 of the 7 case study participants were still at risk for falling. The cut point for the Tandem Leg Stance is twice as long. According to test criteria, only 1 person was at risk for falling after taking the course. The Tandem Leg Stance test may be an appropriate indicator of falls for those participants that use walking devices or power mobility devices in daily life, and are testing without these devices.

The 360 Degree Turn Protocol is highly correlated with gait speed and dynamic balance. The results of this test varied greatly, from 62% faster to 28% slower. At the end of the study, all 7 subjects were faster than the cut point for fall risk - greater than 3.8 seconds.

The seven case studies demonstrate an increase in core strength and dynamic stability for people with disabilities and chronic conditions. More studies are needed to determine static and dynamic stability gains/losses.

Applications to Practice:

Peyow Aqua Pilates seems to be applicable for increasing core strength and dynamic balance in special populations that may or may not be able to do Pilates exercises on land. This aquatic intervention could make Pilates exercise classes more accessible to a wider variety of populations.

Peyow Aqua Pilates exercise adaptations may be a safe and beneficial environment for training persons with multiple disabilities in a group setting or post-rehab as a continuum of care for patients.

Patients with spinal injuries (compressions, surgeries, fusions, scoliosis, osteoporosis, and osteopenia) can safely strengthen the spinal and core stabilizers. The Peyow Aqua Pilates method may be beneficial to patients with multiple sclerosis and lupus without over-taxation. This may be a protective method for hypermobile patients as they learn to brake prior to hyperextension with the controlled Pilates movements.

In a younger or general population, group classes of Pilates in the water could make a broader range of this modality more affordable and readily available for university students, as well as increase kinesthetic postural awareness.