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# Conditioning for Greater Leg Extension

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There are a number of attributes that dance teachers work diligently to develop in their students. One of the most impressive and sought-after skills is a high “extension”. This, of course, refers to the height of the gesture leg, either to the front or side, and is practiced both at barre and in center with adagio music and *développé* exercises. A standard ballet class will have at least one exercise at barre (thus a repetition to the right and another to the left) and one other exercise in center (again, with a

repetition to the right and left side) to train the extension that defines the *développé*.

It is beyond the scope of a dance class to expect to develop the necessary components of strength, flexibility, and neuromuscular coordination required of the performing artist. To this end, many teachers and researchers recommend outside conditioning. Conditioning outside of the dance class has shown good results for back strengthening and arabesque height in a 10-week training program docu-



**Figure 1.** Passive Range of Motion



**Figure 2.** Active Range of Motion



**Figure 3.** Therapeutic exercise for increased ‘extension’

mented by Welsh and colleagues.<sup>1</sup> Increases in measured strength have also been documented by Koutedakis for leg strength,<sup>2</sup> and Stanforth for abdominal strength.<sup>3</sup> It seemed clear to us that the same expectations could be held for gaining greater height in dancers’ extensions.

We engaged 16 healthy university level dancers and tested them initially for active and passive ranges of hip motion, simulating a *développé à la seconde*. (Those combined actions are known as flexion, abduction, and outward rotation of the hip.) Research had suggested that ballet dancers have a measurably greater passive range of motion than the normal population of females.<sup>4</sup> Our goal was to see if we could get the active range of motion to be closer to the passive range of motion. We placed the dancers near a wall, in front of a measuring tape. They were given hand support to simulate a barre. They held their gesture heel with the same side hand and lifted it to the side (passive range of motion). A photograph was taken in this position (see Figure 1). The dancers then let go of the heel and tried to maintain the same leg height (active range of motion). A second photograph was taken (see Figure 2). Coaching was provided to maintain proper alignment and body position. We measured the difference in leg height between the first and second photograph.

We then divided the students approximately in half and

told one group to simply continue with their dance classes. The second group was taught a five-minute therapeutic exercise and asked to perform it in three sets of ten repetitions, on both legs, three days a week for six weeks. The exercise was a modified leg raise: in a long sit position the dancers leaned back on their hands and the leg to be exercised was turned out and the knee flexed, like a front attitude (see Figure 3). The aim was to engage the quadriceps as little as possible and focus the work on the hip flexors; the dancers were coached to achieve this aim. In six weeks we brought everyone back and re-measured their active and passive ranges of motion. Again, we measured the difference in the two photographs. All the dancers who did the therapeutic exercise saw an increase in their *développé à la seconde*. The average height increase was 6.5". The dancers that did no extra training showed no change in the six-week period.

It should be noted that the dancers who saw the gains from the extra exercise were asked to execute this training on their own. Most chose to take a bit of time after class to complete their “assignment”. It was not labor-intensive, and it should be stated that the dancers clearly understood the purpose of our study. They were quite pleased with the results.

The hip flexor muscles are used in a high percentage of dance steps. In class, however, they are not isolated for strength training. Dancers may have adequate to above normal range of motion in their hips, but may lack the physical strength or motor control required to lift their legs to the end point of range of motion. Our small endeavor showed that specialized training may help the dancer achieve a higher *développé à la seconde*. Likewise, other studies that have focused on a single part of the body have shown that gains can be made through outside conditioning that may improve important dance skills.

#### **Acknowledgment**

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#### **References**

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