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# Timing Matters!

## Ballet Training in Soft Blocks

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A female adolescent dancer's body is often placed under varied physical demands in preparation for a professional career in ballet during her vocational training.<sup>1</sup> It is of great interest to those involved in her ballet training that improvements in her performance and skill are sustainable as the technical demands increase. In order to do so, the growing adolescent body requires gradual changes to physical achievement, training hours, or training focus in order to adapt effectively.<sup>2</sup> If this gradual approach is not adopted, fatigue will ensue resulting in poorer control of the dancing body, increasing risk of injury and impairing performance.<sup>3</sup>

A key milestone for all aspiring young female dancers is starting pointe work.<sup>1</sup> It is well known that pointe shoes place an increased demand on the joints of the feet.<sup>4,6</sup> The body must be gradually prepared to control the foot during pointe work if it is to accept this demand and therefore allow the dancer to improve her technique en pointe.

The purpose of this study was to investigate how the different ballet shoes that young dancers use contribute to a gradually adaptive training environment as they prepare for and develop their pointe work. In order to obtain a fuller picture, the study was carried out in two parts: 1) measuring underfoot pressures of the different ballet shoes; and 2) collecting information on ballet shoe use, training, and injuries among female adolescent dancers in vocational training.

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### Part 1.

The objective in this instance was to measure underfoot pressures in three types of ballet shoe: split sole soft shoes (Sansha tutu split), soft blocks (Grishko 2007), and pointe shoes (Grishko 2007). Eight female dancers from an undergraduate dance degree program with experience in pointe work performed a trial consisting of a controlled, timed, demi-plié through to a rise on demi-pointe on a pressure mat. Pressures were recorded for each trial. Each trial was carried out in soft shoes, soft blocks, pointe shoes and in bare feet for comparison. Pointe shoes were fitted new a

week before the trials and were permitted to be broken in by the dancer so that she could find her demi-pointe in the pointe shoe. The data were then analysed for differences in pressure. Pressures recorded during the pointe shoe trials were significantly higher than those during the soft shoe trials. However, no significant differences in pressure were measured between soft blocks and soft shoes, nor soft blocks and pointe shoes, indicating overall that the soft blocks provide a transitional stage in pressure between soft shoes and pointe shoes. Progression can be observed from soft shoes to soft blocks to pointe shoes, the latter having significantly higher pressure values.

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### Part 2.

Sixty-five female dancers currently training at UK vocational schools of dance completed a questionnaire with details including their training, shoe use, and injury. All dancers were training en pointe, their main dance discipline was ballet, with an average age of 13.5 years plus or minus 1.5 years. Injury data were sorted so that only relevant injuries were considered in this study. These were any lumbar spine or lower limb musculoskeletal injuries that occurred or were first noticed during ballet practice (ballet injury), or any musculoskeletal injury located below the knee occurring during any dance-related activity (lower leg, ankle, and foot injury). Relationships were then explored between training frequency, pointe experience, current shoe use, shoe use before starting pointe, and relevant injuries sustained throughout training.

Young dancers train using one of three shoe progression scenarios:

1. Wearing soft shoes only before starting pointe work, then continuing to practice in soft shoes only when not in pointe shoes;
2. Wearing soft shoes, then soft blocks for a period prior to starting pointe work;
3. Wearing soft shoes only prior to the start of pointe work and then, having started pointe work thereafter train in soft blocks.

A dancer was found to be more likely to sustain a relevant injury if she had not worn soft blocks prior to starting pointe work (progressions 1 and 3). In contrast, dancers who wore soft blocks before starting pointe work were more likely to report their first relevant injury at an older age than those who did not wear them beforehand (progression 2). The reason for this may be that progression 2 allows for a more gradual adaptation to the demands of pointe work, specifically adapting to the pressures experienced when dancing in the different shoes.

Having started pointe work, injury rates were higher among dancers who currently wore soft blocks during class. Dancers who wore their soft shoes or a combination of soft shoes and soft blocks during class outside of their regular pointe work reported fewer relevant injuries.

In conclusion, this study supports the practice of wearing soft blocks in the months leading up to a young dancer starting pointe work so as to prepare the feet for the increased demands on her joints. This practice, combined with a suitable controlled strengthening and technical development exercise program,<sup>7</sup> is considered optimal preparation for pointe work preparation.

Once a dancer is working in pointe shoes, an effective way of reducing underfoot pressures is to encourage her to wear a variety of shoes in her daily class, i.e. soft shoes and soft blocks. For practical purposes, soft shoes could be worn for some classes and soft blocks for others. This plays a role in promoting and sustaining musculoskeletal health in young dancers in their early years of training en pointe.

### Acknowledgment

This article is adapted from: Pearson, SJ, Whitaker, AF. Footwear in classical ballet: a study of pressure distribution and related foot injury in the adolescent dancer. *J Dance Med Sci.* 2012;16(2):51-6.

### References

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