

# When Can I Start Pointe Work?

## Guidelines for Initiating Pointe Training

David S. Weiss, M.D., Rachel Anne Rist, M.A., and Gayanne Grossman, P.T., Ed.M.

### Abstract

The initiation of pointe training for dance students should be determined after careful evaluation of a number of factors. These include: the dance student's stage of physical development; the quality of her (or his) trunk, abdominal and pelvic control ("core" stability); the alignment of her legs (hip-knee-ankle-foot); the strength and flexibility of her feet and ankles; and the duration and frequency of her dance training. For students who meet the requirements related to all of these factors, began ballet training at age eight or later, and who are taking ballet class at least twice per week, pointe work should be initiated in the fourth year of training. Students with poor core stability or hypermobility of the feet and ankles may require additional strengthening to allow them to safely begin pointe training. For those who are

only taking ballet classes once per week, or who are not truly pre-professional, pointe training should be discouraged. No student with insufficient ankle and foot plantar flexion range of motion or with poor lower extremity alignment should be allowed to do pointe work.

The young dancer asks, "When can I begin pointe work?" The answer usually given, almost without thought, is "at 12 years of age." It would be better if the response were "What kind of dance student are you?" Starting pointe at age 12 presupposes that the child is beginning her fourth year of ballet classes at a dance academy with a program designed to train professional ballet dancers. Acceptance to such a program would indicate that, at age eight or nine,

the child had sufficient anatomic facility. The program itself would consist of classes progressively increasing in difficulty and frequency over the first three years. By age 12 the student would be taking four classes per week. Her feet and ankles would be strong, her trunk and pelvic control would be good, and her proprioceptive skills would be properly developed. Pointe work would begin with 15 minutes of exercises at the end of each class.<sup>1-6</sup>

This student should be distinguished from the child who began classes at age five at a local dance school and now, at age ten, takes one ballet and one tap class a week. She is small for her age, with weak feet and ankles. She is very "loose-jointed" (hypermobility) in her spine, knees, feet, and ankles. Her teacher wanted her to start pointe work two years ago, but the mother thought she wasn't serious enough about her dancing. Her cousin began pointe work at age ten and she wants to know why she can't start now.

David S. Weiss, M.D., is at the Harkness Center for Dance Injuries of NYU Hospital for Joint Diseases, NYU Langone Medical Center and in the Department of Orthopaedic Surgery at New York University School of Medicine, New York, New York, USA. Rachel Anne Rist, M.A., is Director of Dance at Tring Park School for Performing Arts, Tring Park, Hertfordshire, United Kingdom. Gayanne Grossman, P.T., Ed.M., is at Temple University, Department of Dance, Philadelphia, Pennsylvania, USA, and Muhlenberg College, Department of Theatre and Dance, Allentown, Pennsylvania, USA.

*Correspondence:* David S. Weiss, M.D., NYU Langone Medical Center, 530 First Avenue, HCC Suite 5D, New York, NY 10016; david.weiss@nyumc.org.

This Resource Paper was written under the auspices of the Education and Media Committees of the International Association for Dance Medicine and Science.

Copyright © 2009 by the International Association for Dance Medicine and Science. This paper may be reproduced in its entirety for educational purposes, provided acknowledgment is given to the International Association for Dance Medicine and Science.

### Growth and Development

Can any one age be the correct answer for all students? Are all girls at the same stage of development at age 12? The answer to both questions is "No." There may be significant differences in girls' physiologic development, depending on the onset and tempo of puberty. After age five linear

growth proceeds at approximately 5.5 cm/year (two inches/year). For girls, the growth velocity increases sharply around age ten and reaches a peak of approximately 10.5 cm/year (four inches/year) at age 12. Peak weight gain velocity of 8.5 kg/year (18.7 pounds/year) is reached at age 12.5 years, and quickly decelerates to less than 1 kg/year (2.2 pounds/year) at age 15.<sup>7</sup> During this rapid growth period there are inevitably significant differences in development from one child to the next. Mr. Justin Howse, retired Consultant Orthopaedic Surgeon to the Royal Ballet Schools and the Royal Academy of Dancing (London, UK), says that “the only factor which matters is the state of development of the child, and to be dogmatic about an age does not make any reference to the child’s maturity or immaturity.”<sup>8</sup>

The completion of growth in a tubular (long) bone is signaled by the fusion or closure of the epiphyses (growth plates). This occurs in the foot slightly earlier than in the leg. The appearance of ossification (bone formation) centers in the foot begins at age two months in utero. The last epiphysis to close in the foot does so at an average age of 16 years in boys and 14 years in girls. From age five through age 12 the average girl’s foot grows 0.9 cm (0.35 inches) per year, reaching an average foot length of 23.2 cm (nine inches) at age 12. Thereafter the average girl’s foot growth rate slows to 0.8 cm (0.31 inches) per year for the next two years.<sup>9,10</sup> The completion of bone growth in the feet is often given as a reason for choosing the age of 12 for beginning pointe work. However, this concept is basically erroneous, as bone growth in the average girl’s foot is not complete at that age.

How far along in bone maturation is any one girl at age 12? Knowledge of statistical averages is not accurately predictive, as chronological age does not necessarily correlate with bone age. Although x-rays can show the completion of

growth in the foot, they are less exact in determining the stage of bone maturation prior to closure of the epiphyses.<sup>7</sup>

If bone growth in the foot is not complete at age 12, and if this is a common age at which girls begin pointe work, is there medical evidence for damage to the bones of the growing foot resulting from training on pointe? Not to our knowledge: not from studies, anecdotes, or the authors’ collective personal experiences. This is not to suggest that initiation of pointe work before age 12 is harmless; indeed, by way of analogy, studies involving gymnasts have established the potential harm of repetitive microtrauma to growing bones.<sup>11</sup>

If neither chronological age nor bone maturation alone determines when to begin pointe work, what other factors must be considered? In the fifth (and final) edition of her seminal book *Anatomy and Ballet: A Handbook for Teachers of Ballet*, Celia Sparger writes: “It cannot be too strongly stressed that pointe work is the end result of slow and gradual training of the whole body, back, hips, thighs, legs, feet, coordination of movement and the ‘placing’ of the body, so that the weight is lifted upwards off the feet, with straight knees, perfect balance, with a perfect demi-pointe, and without any tendency on the part of the feet to sickle either in or out or the toes to curl or clutch. This moment will arrive at different times in different children, not only by virtue of previous training but according to their physical type, and in this may be included the growth of the bones.”<sup>12</sup>

### Risks Associated with Starting Pointe Too Early

As Sparger’s statement suggests, the potential dangers to the child from being placed on pointe before she is ready have less to do with actual bone or joint damage (although these are real) than with inadequate range of motion, strength, and stability. These factors may cause un-

due stress on the leg, pelvic girdle, and trunk.

The child with hypermobile feet and ankles is particularly at risk if placed on pointe too early. This condition, commonly described as the “over-arched” or “over-pointed” foot, can be deceptive. These students have the suppleness to achieve, or even exceed, the required pointe position, and thus they are more likely to be selected for ballet in general and pointe work in particular. However, they often lack the required strength and postural control to work safely on pointe. Prior to beginning pointe work in these students all the muscles of the leg must be strengthened, and adequate proprioceptive control developed, to facilitate correct alignment.

At the opposite end of the spectrum, the child with an inflexible foot and ankle, resulting in insufficient plantar flexion range of motion, is also at risk. To ensure proper alignment on pointe the line of the metatarsals (represented by the top surface of the forefoot) should be parallel to the line of the tibia (front of the shin) when the foot is pointed (combined ankle and foot plantar flexion). Attempting to perform pointe work without such anatomic facility will place excessive stresses not only on the foot and ankle, but also on the leg, pelvic girdle, and trunk. If there is hyperextension (“sway-back”) of the knees, even more ankle and foot range of motion (plantar flexion) is needed to assure proper alignment on pointe. Unfortunately, insufficient range of motion may not improve with time, and children with these restrictions may never obtain sufficient flexibility for pointe work.

### Assessing the Pre-Pointe Student

One of the factors affecting the development of muscular strength and proprioceptive ability is the age at which the child has begun studying ballet. Although movement classes beginning at age four may be beneficial for other purposes, no proper

ballet training can be accomplished before age eight (both Cecchetti and Balanchine agreed on this). Another factor is the frequency with which the child takes ballet class. In general, students taking ballet class once a week will progress more slowly than those taking twice a week. Those taking four ballet classes a week will progress fastest, but this frequency is usually found only in professional schools or academies.

Within any given class of 13 year olds there will be girls in different stages of pointe work, just as there will be a variety of physiques and abilities. This places a heavy responsibility on the dance teacher. The growth and development of each student needs to be considered when determining readiness to begin pointe work. Teachers should perform their own pre-pointe assessment to ascertain whether the student has proper postural control (with good abdominal and trunk support), sufficient lower leg strength, and appropriate leg (hip-knee-ankle-foot) alignment to begin or continue working on pointe. Communication with parents is essential to explain the reasons behind every decision, thereby preventing misunderstandings.

Finally, we offer two observations that emphasize the importance of making a proper assessment of when to start pointe work. First, the dancer who is struggling to work on pointe may have difficulty developing other aspects of her ballet technique; second, due to inability to execute the movements required to dance properly on pointe, she may be prone to psychological problems, including decreased confidence and poor self-esteem. Hence, we suggest that it is wise to be conservative in choosing when to begin pointe

work. As Howse notes: "There are certainly well-known dancers who were not strong enough to start their pointe work until they were over the age of sixteen and this has proved no handicap in their career."<sup>8</sup>

### Guidelines

To summarize the above discussion we offer the following guidelines for when to begin pointe training:

1. Not before age 12.
2. If the student is not anatomically sound (e.g., insufficient ankle and foot plantar flexion range of motion; poor lower extremity alignment), do not allow pointe work.
3. If she is not truly pre-professional, discourage pointe training.
4. If she has weak trunk and pelvic ("core") muscles or weak legs, delay pointe work (and consider implementing a strengthening program).
5. If the student is hypermobile in the feet and ankles, delay pointe work (and consider implementing a strengthening program).
6. If ballet classes are only once a week, discourage pointe training.
7. If ballet classes are twice a week, and none of the above applies, begin in the fourth year of training.

George Balanchine, master of choreography on pointe, has been credited with having created the "baby ballerina." He is reported to have said that there is no reason to get a young dancer up on full pointe if she cannot do anything when she gets there!<sup>13</sup>

### References

1. Barringer J, Schlesinger S. *The Pointe Book* (2nd ed). Princeton, NJ: Princ-

- eton Book Co., 2004, pp. 136-157.
2. Grieg V. *Inside Ballet Technique*. Princeton, NJ: Princeton Book Co., 1994, pp. 104-106.
3. Guggenheim CL. A survey of elite professional ballet schools regarding the initiation of pointe work in children. *Med Probl Perf Art*. 1994;9:15-7.
4. Huwylar JS. *The Dancer's Body: A Medical Perspective on Dance and Dance Training*. Germantown, MD; International Medical Publishing, 1999, pp. 115-119.
5. Solomon R, Micheli LJ, Ireland ML. Physiological assessment to determine readiness for pointe work in ballet students. *Impulse*. 1993;1(1):21-38.
6. Watkins A, Clarkson PM. *Dancing Longer, Dancing Stronger*. Princeton, NJ: Princeton Book Co., 1990, p. 69.
7. Roemmich JN, Rogo, AD. Physiology of growth and development: its relationship to performance in the young athlete. *Clin Sports Med*. 1995;14(3):483-502.
8. Howse J. *Dance Technique and Injury Prevention* (3rd ed). London: A & C Black, New York: Routledge, 2000, pp. 59-60.
9. Blais MM, Green WT, Anderson M. Lengths of the growing foot. *J Bone Joint Surg Am* 1956;38(5):998-1000.
10. Sarrafian SK. *Anatomy of the Foot and Ankle: Descriptive, Topographic, Functional* (2nd ed). Philadelphia: Lippincott, 1993.
11. Zetaruk MN. The young gymnast. *Clin Sports Med*. 2000;19(4):757-80.
12. Sparger C. *Anatomy and Ballet: A Handbook for Teachers of Ballet* (5th ed). London: Adam & Charles Black, 1970, pp. 74-8.
13. Hamilton WG. Ballet. In: Reider B (ed): *Sports Medicine, The School-Age Athlete* (2nd ed). Philadelphia: W.B. Saunders, 1996, pp. 543-581.