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Managing Joint Hypermobility – A Guide for Dance Teachers

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Summary

Joint hypermobility (a larger than average range of movement at a joint), which can be inherited or acquired through training, is common among dancers because of the aesthetic and flexibility requirements of dance.

Many hypermobile dancers notice that their skin, fascia, ligaments and joint capsule stretch more than normal, causing difficulty in joint control. A proportion also experience symptoms of Hypermobility Syndrome (HMS), usually pain, in which parts of the body other than the joints are also affected. However, through exercise and good dance technique, naturally flexible dancers as well as those with HMS can strengthen the muscular system and control the range of joint movement while making the most of their advantageous line and aesthetics

It is essential that teachers and dancers understand the unique demands of hypermobility. This sheet gives recommendations for training for hypermobile dancers including training in imagery, proprioception, posture, and endurance, as well as psychological considerations.

What is Joint Hypermobility?

A hypermobile joint is one with a greater than average range of movement when measured by eye or more accurately with a goniometer (Figure 1). A key component in many styles of dance is joint flexibility, which allows aesthetically pleasing body postures. Thus, joint hypermobility, either inherited or acquired through training, is felt to be advantageous in the selection process and at audition for vocational schools. It is therefore highly prevalent amongst dancers but requires careful attention and support during training in order to realize potential and also avoid injury.

A Hypermobile Joint



Figure 1: Hyperextension of the elbow by more than 10 degrees as measured with an angle goniometer

Generalised Hypermobility and Hypermobility Syndrome

There are many dancers who are hypermobile and manage a successful career maximizing their flexibility and line and avoiding injury. It is usually possible to be hypermobile and not experience pain or injury (asymptomatic hypermobility). However, some hypermobile individuals will experience both pain and injury and for this some use the term Joint Hypermobility Syndrome or HMS (symptomatic hypermobility). There are several reasons why some hypermobile dancers might experience pain whilst others do not – this is beyond the scope of this article, however it is important to be aware of injury risk amongst hypermobile dancers. Dancers in any case have a high prevalence of injury. In a survey of dancers conducted by Dance UK in 2005, 80% of dancers experienced injury each year.

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Causes of Hypermobility

The range of movement at any single joint varies throughout the population according to several factors that vary from individual to individual. There are four main contributing factors; some are hereditary and others acquired: **1) Bone Shape:** The shape of the articulating surfaces will influence the range of movement at a joint. A shallow socket at the hip joint, for example, will allow an increased range of movement compared to a deeply cupped socket which will result in a more restricted range. This is unlikely to be altered significantly by training. **2) Collagen:** The joint is stabilised by the joint capsule. The capsule is strengthened by collagen, the composition of which varies between individuals on a genetic basis though is capable of some stretching through training. An individual with lax collagen is likely to have more excursion of the joint than usual. **3) Muscle wasting/ decreased strength** can also potentially be a factor in hypermobility. If just one of the muscles acting about a joint is wasted/lacking strength, perhaps as a result of injury, there is likely to be unidirectional hyperflexibility at that joint. **4) Proprioception:** There is some evidence that impaired position sense (proprioception) may aggravate hypermobility. **5) Hormonal factors:** In females especially, hormonal factors can also contribute. Just as hormones allow opening of the female pelvis prior to childbirth through ligamentous loosening, so when the menstrual cycle is progesterone dominated towards menstruation, joints may loosen and the dancer may tend to wobble unless the cycle is regulated by a suitable oral contraceptive. Progesterone only preparations and irregular periods often also make things worse.

The final range of joint movement results from a mixture of these several factors, some inherited and some acquired, and may be further influenced by training. In females especially, hormonal factors can also be contributory.

Quantification of Joint Hypermobility

A five point questionnaire (Table 1) has been validated as a very simple first screen when there is suspicion of hypermobility.

Table 1: A five point questionnaire for the detection of hypermobility

Do you have Hypermobility?

Here is a 5-part questionnaire to identify hypermobility. If you answer yes to at least 2 of the 5 questions then there is an 80-90% chance you are hypermobile.

- >> 1. Can you now (or could you ever) place your hands flat on the floor without bending your knees?
- >> 2. Can you now (or could you ever) bend your thumb back to touch your forearm?
- >> 3. As a child did you amuse your friends by contorting your body into strange shapes or could you do the splits?
- >> 4. As a child or teenager did your shoulder or knee cap dislocate on more than one occasion?
- >> 5. Do you consider yourself to be double-jointed?

Source: Prof Rodney Grahame & Dr Alan Hakim Department of Rheumatology, University College Hospitals, London

If this suggests the presence of hypermobility, the more conventional simple medical screen for the detection of joint laxity is the Beighton 1973 scoring system (Figure 2). One point is allocated for the ability to perform each of nine simple manoeuvres. The threshold for defining hypermobility is usually set at four or five out of nine, but is somewhat arbitrary and is influenced by gender, race, age and training.

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The Brighton scoring system, which incorporates the Beighton score but also explores parts of the body other than joints, is used by clinicians where there is suspicion of more widespread inherited abnormality of collagen. It incorporates an assessment of pain arising from joints and has led to the concept of Hypermobility Syndrome (HMS) of which the lax joints are just one manifestation. For further reading on the Beighton and Brighton scoring systems the reader is referred to chapters 2 and 8 of *Hypermobility of Joints* by P Beighton, R Grahame and H Bird, 2012 (Fourth edition) published by Springer.

It should be appreciated however that none of these scoring systems were introduced for the measurement of laxity in dancers. A particular failing with them is the big difference that can occur in some dancers when measured cold and after warm-up. There is an urgent need for the development and validation of new scoring systems for the measurement of joint laxity that are specific for dance. It is also probable that a single scoring system might not be applicable to all the many different types of dance.

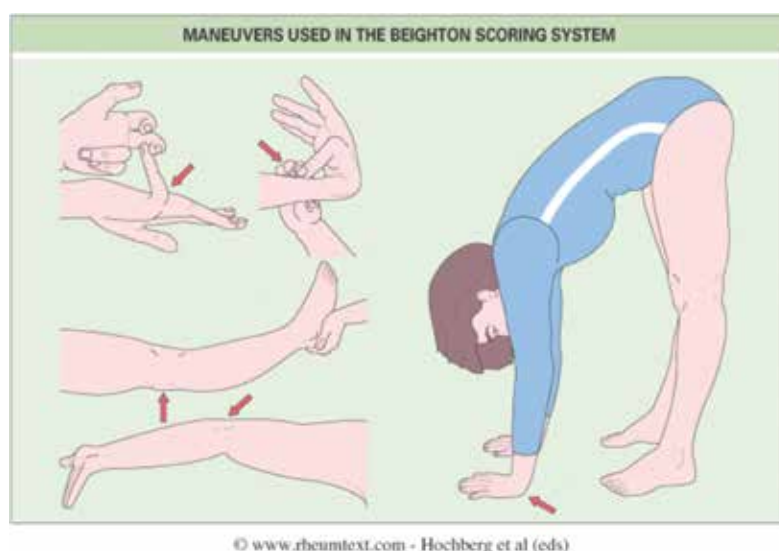


Figure 2: Beighton diagrams

Table 2: The 9-point Beighton Scoring System for Joint Hypermobility Scale

<p>Scoring 1 point on each side</p> <ul style="list-style-type: none"> >> Passive dorsiflexion of the fifth metacarpophalangeal joint to 90° >> Apposition of the thumb to the flexor aspect of the forearm >> Hyperextension of the elbow beyond 10° >> Hyperextension of the knee beyond 10°
<p>Scoring 1 point</p> <ul style="list-style-type: none"> >> Forward trunk flexion placing hands flat on floor with knees extended
<p>Maximum score = 9 (Adapted from Beighton et al.)</p>

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Considerations for dancers with Generalised Hypermobility and Hypermobility Syndrome

Posture, Strength and Control

Hypermobile people often have poor posture and can be seen to be slouching, adopting 'end of range' postures and hanging into their hypermobile joints. They might be observed standing with their legs crossed or leaning on the edges of their ankles, sinking into the front of the hips and the backs of the knees in the typical 'swayback posture,' (see Figures 3a and 3b). Very often individuals exhibit these 'strange' postures as a way of gaining some stability and control which they are frequently lacking.



Figure 3a: swayback posture



Figure 3b: posture corrected

Proprioception

Proprioception is about knowing, understanding and sensing where our bodies are in space without seeing them. Research has shown that proprioception is not always as good in hypermobile individuals which perhaps explains why they are sometimes more clumsy and at increased risk of injury. Dancers require excellent balance mechanisms and joint proprioception for the control they require. Hypermobile dancers need to do more to improve their balance and proprioception. This all takes time and practice. Specific exercises might be given by body conditioning and ballet teachers and/or physiotherapists to improve this important sense of spatial awareness.

Although conventional studios have mirrors and dancers use them, hypermobile dancers should not use them excessively. Hypermobile dancers should work to develop good sensory feedback to promote improved proprioception. Exercises or balances with the eyes closed can help hypermobile (and non-hypermobile) dancers to train their sense of balance and proprioception.

Proprioception, Touch and Taping

Touch can improve sensory feedback and awareness in hypermobile dancers, particularly when trying to avoid end range, correcting alignment and working on muscle activation. Using physiotherapy tape over the back of a 'sway back' knee increases sensory feedback, encourages a more neutral alignment and can discourage hyperextension and lack of control.

Imagery

Effective use of imagery benefits all dancers, but can be particularly helpful for hypermobile dancers – a suggested example might be to ask them to imagine there are pockets of air behind

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the knees as a way of helping the dancer to avoid hyperextension of the knee joint.

Imagery can also be used as a way of rehearsing movement without necessarily performing it. The brain is an amazing tool in this capacity and it is therefore a good way of conserving energy and mentally imaging or rehearsing movement.

Use of First Position and 'Ronds de jambe à terre'

The use of first position can be particularly difficult for young dancers with hypermobile knees. There has been debate about whether hypermobile dancers should leave a small gap in the heels at first, to allow for some sensation and more effective engagement of the quadriceps and adductor muscles, and to close the gap over time as the dancer gains better control.



Figure 4a: usage of the first position with a large gap



Figure 4b: the same dancer but with the use of adductors

Exercises in classical ballet that require the dancer to go through the first position can also be a challenge, but this will also depend upon the leg shape, the degree of knee hyperextension and how well the dancer manages the control of the range of movement. Re-education is certainly possible, but takes patience, time and the support and guidance of an experienced teacher.

Stretching

Hypermobile dancers like to stretch. They find it easy and it feels good, but stretching for long periods into the end of range may lead to instability and even injury. Stability and strength should be developed as a priority. However, even in hypermobile dancers there will be areas of restriction and tightness and it is good to stretch these, whilst avoiding stretching areas where there is already excessive mobility.

Pacing and Strengthening

Since exercise is one of the best ways to develop strength and manage hypermobility, it can be seen why dance is such a desirable form of exercise. Many hypermobile people are naturally attracted to dance because of their additional flexibility. However, strength and fine control are essential components to match increased flexibility and end of range movement. Additional coaching, conditioning and physiotherapy exercises can be useful to gain strength and reinforce movement patterns. It is also important to note that it takes longer for hypermobile dancers to gain strength. This may be hindered during the adolescent growth spurt, meaning that the hypermobile dancer must be trained more carefully and at a slower pace compared to others in class. If, however, the training is taken slowly, and the appropriate strengthening gains made, a career can be launched successfully with less risk of injury. Pointe work should be delayed until

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foot strength and trunk stability is fully established. Time and patience will ensure that the dancer can make the most of their flexibility. In conclusion, teachers and dancers must understand the needs of these different physiques.

Endurance

Dance teachers need to understand that the hypermobile dancer may have greater difficulty with endurance owing to weaker core and stabilising muscles. Hypermobile dancers tend to fatigue earlier with repetition and this is probably because they have to work harder to control and coordinate, and it is important that dance technique teachers take this into account during training.

Psychology

Because hypermobile dancers, particularly those with HMS, tend to heal more slowly, this results in more down time. They may be out of class for longer, need more rehabilitation time, and could fall behind their peers and lose out on the training they so dearly need. This frustrating situation may well have psychological implications.

The psychological implications of injury in dancers have only recently begun to receive adequate attention within the research field of dance medicine and science. In terms of hypermobile dancers there is literature about improving strength and proprioception and preventing the dancer going into the extremities of their joint hypermobility, but the psychological implications of the hypermobile dancer who is frequently injured or missing class is rarely discussed. If the dancer is showing signs of anxiety or depression it would be useful to consider counselling and other support.

Other Training and Learning Needs

Some early research has suggested possible links between Developmental Coordination Disorder and Hypermobility. It is too early yet to suggest whether other conditions such as Dyslexia or Attention Deficit Disorder might also be linked to either hypermobility or HMS. However it has been anecdotally noted that some hypermobile (particularly HMS) dancers appear to be more 'distracted' in class and have greater difficulty in following sequences, so have increased problems with sequential memory compared to their non-hypermobile peers. Further research would need to be taken to investigate this, but since the hypermobile dancer has to work far harder to build control, it does make sense that they will have to concentrate more on their movement. Perhaps brain capacity is temporarily overloaded making it more difficult to manage all the other demands and instructions in class. Finally, hypermobile dancers will fatigue faster than non-hypermobile dancers and so it is essential that they get adequate rest and recovery.

Special considerations for Hypermobility Syndrome

HMS is so much more than having hypermobile joints. Hypermobility Syndrome is a multisystemic condition which means that many organ systems can be affected. The body is held together by connective tissue – skin, fascia, ligaments and joint capsule. The walls of blood vessels, the intestinal tract, airways and lungs are also made up of connective tissue. Collagen is the main component at these sites and is faulty in hypermobility syndrome. In HMS collagen is extra stretchy, flaccid and fragile. Therefore it cannot support, bind and stabilise as well as normal tissue. This can lead to elastic skin (an obvious sign), a problematic digestive system leading to Irritable Bowel Syndrome (IBS) or asthma in part due to excessively stretchy tissues in the respiratory system.

Pain and Injury

Dancers with HMS may experience pain, with or without injury. Although all hypermobile dancers are at an increased risk of injury, research in dance companies (McCormack et al 2004) shows a greater risk of injury in dancers with HMS though the reason for this is not entirely clear. This type of tissue is slower to heal and dancers maybe more likely to miss out on valuable class time. In vocational schools this may lead to time/training loss. Understanding the causes, implications and prevention of injury in these physiques is thus a priority for teachers and directors.

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Diagnosis of HMS is usually made by a Rheumatologist who, especially if trained in Performing Arts Medicine, will be able to suggest any ongoing support required by the dancer in order to manage their condition. However, exercise is a very important factor in managing HMS and the discipline of good dance technique can both strengthen the muscular system and control joint range of movement while making the most of line and aesthetics.

Conclusion

Hypermobility is considered advantageous in dance, and therefore is highly prevalent. However, the different levels of hypermobility need to be understood, and these dancers should be given specialised attention and support during training if injury is to be avoided and potential truly realised.

Resources

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Hypermobility Syndrome Association

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The National Institute for Dance Medicine and Science now offers educational workshops on hypermobility in dancers and other subjects. For more information, please email hdp@danceuk.org

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