THE ADOLESCENT GROWTH SPURT AND DANCE

THE USE OF PILATES TO EASE A YOUNG DANCER THROUGH THE GROWTH SPURT

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SUMMARY

The growth spurt peaks at around 11 / 12 years old (girls). It is usually around this time when dance becomes more physically demanding, time consuming and when students are starting to consider whether to take their dancing seriously or not. Because of the enormous psychological and social changes that the young dancer is going through they become extremely vulnerable and may be easily convinced to give up dance, because of pressure to spend more time with friends and because it becomes more difficult.

Sudden increases in height and weight cause decreases in strength, flexibility, co-ordination, and balance. This along with dramatically fluctuating hormone changes can overwhelm the young dancer. The way the growth spurt is handled by parents and teachers can have a profound impact on the students dance development as well as psychological health. It is important that the young dancer is made aware of the changes in their bodies so they can have a healthy approach to the modifications in their training.
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ANATOMICAL DESCRIPTION OF THE PELVIS AND SURROUNDING MUSCLE GROUPS

The aim of this research is to address imbalance and alignment issues that are experienced with the rapid, uneven growth that is associated with adolescence. Correct alignment through the whole body stems from correct placement of the pelvis and therefore I’ve chosen the pelvis and surrounding muscle groups to be my area of focus.

THE PELVIS


The Pelvis is a large bony ring like structure connected to the sacrum (sacroiliac joint) and the femur of the legs (hip joint). It is comprised of two hip bones which curve forward and join at the front. The hip bone is made up of the Ilium (a large wing-like bone) connected to the Ischium and the Pubis by fused joints. These three bones meet to form the Acetabulum (the socket part of the hip joint).
THE ABDOMINALS

There are four muscles that make up the abdominal wall. The Rectus Abdominus is the top most layer of abdominal muscle. The fibers run vertically from the pubic bone to the rib cage. Its main function is flexion. The Internal and External Obliques are situated laterally to the Rectus Abdominus. The muscle fibres run diagonally across the abdomen and connect to the Linea Alba (a tendonous band that runs vertically down the centre). Its main function is Lateral flexion / rotation. The Transverse Abdominus is the deepest layer of abdominal muscle. The fibres run horizontally around the torso like a corset. The main function is trunk and pelvic stability.

PELVIC FLOOR

The pelvic floor is a group of muscles that form the bottom of the ‘pelvic bowl’. These muscles stretch from front to back and side to side and provide support for the organs that are situated within the ring-like structure of the pelvis. They also provide a stabilizing function during Pilates exercises.

BACK MUSCLES

The Erector Spinae are three muscles that run longitudinally up the spine. They are the Spinalis, Longissimus and Ilocostalis. Together they are responsible for spinal extension, rotation, and lateral flexion. Another muscle involved in Lateral flexion is the Quadratus Lumborum. It is more or less square in shape and connects the last rib to the Iliac crest.
ILIOPSOAS

The Iliopsoas (the hip flexor) is comprised of three muscles the Psoas Minor and Major and the Iliacus. The Psoas Major attaches at the lumbar spine runs over the front of the hip and attaches at the front of the top of the Femur. Together these muscles are responsible for flexion of the hip to move the thigh or in assistance of the rectus Abdominus when sitting up from supine position. This muscle also plays a vital role in maintaining the natural curvatures of the spine (neutral).

GLUTEALS AND DEEP OUTWARD ROTATORS

There are three Gluteal muscles. The Gluteus Maximus, Medius and Minimus. The Gluteus Maximus is the largest and strongest of the three and its function is extension and external rotation of the hip. The Gluteus Medius and Minimus work together to produce abduction and internal rotation of the hip. The Deep Outward Rotators are group of small muscles located beneath the Gluteus Maximus and Medius and aid the Gluteus Maximus in external rotation of the hip.

Other muscles groups that should be mentioned are the Quadriceps, Hamstrings and Adductors. These muscles make up the bulk of the thigh and are responsible for various movements of the hip. The Rectus Femoris is the most prominent, front and central muscle of the Quadriceps and works with the Iliopsoas to produce flexion of the hip. The Hamstrings (Semimembranosus, Semitendinosus, Biceps Femoris) are located at the back of the thigh and work with the Gluteals to produce hip extension. The Adductors are the Adductor longus, Brevis, Mgnus and the Gracilis. These muscles are located on the medial side of the thigh.
WHAT IS THE ADOLESCENT GROWTH SPURT

The growth spurt is the rapid and intense increase in height and weight that occurs during adolescence.

The growth spurt begins on average at 8-10yrs old for girls and 10-12yrs old for boys, although there is considerable variation between individuals and populations. The intensity and duration is on average greater for boys than girls but usually peaks at 11-12yrs old for girls and 13-14yrs old for boys, lasts 2-5 years and is associated with puberty. A host of psychological changes accompany teenagers during puberty. Adolescents become obsessed with their changing bodies and generally girls have a more negative view of these changes due to increase in body fat and exposure to media stereotypes of beauty.

HOW DOES THIS AFFECT THE DANCER

The long bones in the body grow first and more rapidly than the torso this creates a challenge for core strength, stability and balance in the dance class especially when the arms and legs are moving rapidly. Often growth is asymmetrical and one arm or leg will be longer than the other, creating imbalance in the alignment of the shoulders and pelvis. This makes it difficult for the dancer to have the correct alignment in positions like arabesques. Muscles do not grow as quickly as bones resulting in a decrease in flexibility and strength. The student who could get their legs high up above 90 degrees will dramatically loose height of leg in a few short months. Decrease in co-ordination and balance will make it difficult for the dancer to turn well and sustain long balances in difficult positions. Rapid growth, decrease in strength and flexibility, and imbalance all lead to an increased risk of injury, especially at growth plates at the ends of bones and unstable joints (hips and knees). This is an emotionally challenging time for the dancer. They are likely to feel a loss of confidence and self esteem due to loss of strength and flexibility and weight gain, as well as being unable to perform steps that previously seemed effortless. Dancers are highly critical of themselves and each other this along with weight gain and the pressure to be slim could lead to dangerous efforts to lose weight. This could have long term health ramifications (early onset osteoporosis). This is why it is vital to educate students and parents on the growth spurt. Understanding that it is temporary, everyone
experiences it, and that you can’t prevent it will give the student a healthy approach to the changes in their body. During this time the dancers training program should be modified to make it less physically stressful. It is advised to use this time to focus on establishing a deeper understanding of good technique, posture and alignment. As well as giving them basic anatomical information and teaching them how the body works in movement. High impact work such as jumps, pointe work (girls) and tricky lifts (boys) should be avoided. As well as excessive repetition of movements that place pressure on vulnerable joints. (Multiple grand plies may be detrimental for the knees.) Instead focus should be on exercises that develop trunk and pelvic stabilization and that create awareness of correct posture and alignment. Doing exercises that teach good movement patterns and correct muscle firing, as well as developing proprioceptive skills will help towards injury prevention. Decreasing the number of hours in the dance studio (usually 3-4hrs a week at this age) and adding an hour of Pilates once a week to the training program will go a long way to taking the students mind off the difficulties they are experiencing in the dance class and give them some confidence during this difficult time. Pilates is ideal for this situation as it is not just a physical training program but addresses the mind and body as a whole.
CONDITIONING PROGRAM

The following conditioning program based on the BASI Block System (ADA) is designed for a female ballet student between the ages of 10-13 years old. The aim of this program is to assist the young dancer through the growth spurt by focusing on:

Building confidence and educating the student about their body

Building core strength and increasing stability of the pelvis, torso and joints

Improving alignment and developing strength and flexibility of the limbs

Increasing co-ordination and improving posture

Creating awareness of the body and establishing good movement patterns

Injury prevention

Please note it is generally not advised for children to work with weights / resistance until 16/17 years old.

This program is intended to be executed on a one to one basis where the instructor will have constant supervision of the client. All exercises on the equipment should be modified to the appropriate resistance (foot work - extra light / light). If the student is too weak / unstable to maintain the integrity of the movement the exercise should be modified to be performed on the mat with the use of accessories like balls, magic circles, therabands, foam rollers etc. (foot work – can be performed standing with a ball between the spine and a wall)
INTENSIONS AND DESIRED OUTCOMES

LESSON 1 - 4

The aim of these lessons is to teach lateral breathing, neutral pelvic and spine positions and activation of the abdominal muscles particularly the Transverse Abdominus (TA). The dancer should already have an understanding of these concepts but not all children will have fully grasped these ideas in the dance class. The lessons should instill a much deeper understanding of correct posture, breathing and use of the TA.

LESSON 3-6

By the 6th lesson the dancer should start to show improved understanding and better execution of the basic warm up exercises. The instructor should also see increased response to cueing and better understanding of correct alignment (neutral spine and pelvis) although they might not yet have the strength / stability to maintain it.

LESSON 5-8

After 2 months the student should be able to begin to apply some of the concepts learned in the Pilates class to her dance classes. She should begin to show signs of slight increase in strength and flexibility. Basic exercises should be executed with increased stability and the dancer should start to feel more confident.

LESSON 7-10

By now the dancer has established a much greater awareness of posture, alignment good movement patterns, and correct muscle firing. She should be showing increased ability to execute movements with stability in the pelvis and limbs, and an overall improvement in strength and posture. The dancer still has a long way to go and should be encouraged to continue with Pilates as a supplement to her dance training.
CONCLUSION

The final point I’d like to make is that all dancers should do Pilates. Dance can cause imbalances in strength and flexibility due to the repetitive nature of the training process. Dancers generally work different muscle groups in only one way and others in another. Eg the Hamstrings are usually very flexible but lack strength and the quads and hip flexors are strong but tight. These kinds of imbalances can cause long term pain and alignment issues as well as put the dancer at high risk of injury. Pilates provides a mindful approach to cross training and gives the dancer the much needed stability to control the somewhat excessive range of motion that they are required to work in. Dancers have to be very in tune with their bodies to be able to portray story line, character and music through their bodies. This connection can often cause often tensions and stress to be experienced physically. It is for this reason that the mind body aspect of Pilates can provide a means of stress release for the professional dancer in a highly competitive industry.
Kathryn Daniels, International Association for dance and medical science (2000).

*The Challenge of the Adolescent dancer.*


McGraw-Hill Education (2013), Author unknown

*Puberty, health and biological foundations*

Retrieved from:

Innerbody .com (1999 – 2013)

Anatomical information


Isacowitz, R & Klippinger,K (2011)

*Pilates Anatomy*

Human Kinetics

Isacowitz, R (2013)

*Study Guide & Work Books*

Body Arts and Science International
| 1 | Gentle loosening of joints and activation of surrounding muscles – head and shoulder rolls, the roll down, flexion and extension of knees and ankles manipulation of pelvis and hip joints. A few gentle stretches of large muscle groups. To be performed both erect and supine. | Pelvic curl, Spine twist supine, Chest lift & Chest lift with rotation, leg lifts & leg changes, leg circles | REFORMER Parallel heels & toes, V-position toes, Open V-position heels & toes, Calf raises, Prances, Prehensile, Single leg heel & toes. | MAT Hundred Prep | MAT Rolling like a ball | REFORMER Standing Lunge (Hamstring Stretch Group) | MAT | MAT Side lift | MAT Back exte |
| 2 | General warm-up – as above. Fundamental warm-up. Pelvic Curl, Spine twist supine, Chest lift, Chest lift with rotation. | Leg lifts & Changes, leg circles | as above | REFORMER Hundred prep | as above | MAT Spine stretch | POLE Pole series | REFORMER Arms supine series | as above |
| 3 | as above | as above | as above | MAT Roll up | as above | MAT Rolling like a ball, Spine Stretch | REFORMER Standing Lunge (Hamstring Stretch Group) | as above | LEG WEIG TS Gluteal s side lying series, |
| 4 | as above | as above | CADALAC Parallel heels & toes, V-Position toes, Open V-position heels & toes, Calf Raises, Prances, Single leg heel & toes | REFORMER Hundred prep | CADALAC Supine leg series | as above | POLE Pole series | as above | LEG WEIG TS Adduct or squeez e |
| 5 | as above | as above | REFORMER as above | MAT Hundred prep, Roll up | REFORMER Supine leg series | as above | REFORMER Standing Lunge (Hamstring Stretch Group) | AVALON / CHAIR Arms sitting series | LEG WEIG TS Gluteal s kneelin g (box) series | as above |

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