

## Appendix IX Information on some basic structure and function of the body, relevant to SCD.

If muscles and joints can be identified, the action and movement can be more easily felt and implemented. In order to aid this, the following must be highlighted: -

- Posture and alignment
- Bones and joints
- Muscles
- Centring of the body

### Posture and Alignment

Good posture is vital for control, safety and efficiency of movement. Standing with feet in parallel position, hip width apart, the area between the hip bones and the bottom of the ribs, should be extended. There should be awareness of “the plumb line”, namely the straight line running from the top of the head to the toes, which should be maintained during movement. Shoulders, hips and knees should be lined up, to maintain correct alignment. At all times, knees and feet must face the same way. From the front, “the plumb line” (sometimes referred to as “the gravity line”) runs down the centre of the body, striking the ground between the feet. The body must be balanced symmetrically on either side of “the gravity line”.

Balance and the placing of feet, accurately required for all steps, will not be achieved without correct alignment. For example balance points in steps:-

- Skip change of step – the position of knee and ankle in extension, after the initial hop.
- Strathspey travelling – plié at the beginning of the step on left leg, with strong extension of right leg.

Focus, the point to which the eyes are directed, also essential in maintaining correct alignment and should be applied throughout all aspects of SCD. Head position and where the dancer is looking, is vital to the total control of the movement being performed. For example:-

- Correct position of head, during formations.
- Changes of direction.
- Keeping head level and eyes off the floor.

### Bones

Bone has tremendous strength. For each normal walking step taken, the weight placed on the knee is three to four times the body weight! Think what SCD demands of the weight bearing joints of feet, ankles, hips and lower back. It is therefore essential to have accuracy of alignment, to protect joints and prevent wear and tear.

The bones of the spine (vertebrae) allow accurate movement when muscles contract. It is *the* area of the body crucial for good alignment and dancers should be aware of and maintain the natural curves of the spine.

- The cervical curve – seven neck vertebrae.
- The thoracic curve - twelve chest/rib area vertebrae.
- The lumbar curve – five lower back vertebrae.
- The five sacral vertebrae – fused to form part of the pelvis.
- The four coccygeal vertebrae – fused to form the coccyx, which is the end of the spine.

## **The use of joints**

Principles for joints.

- A joint is where bones meet, which will allow movement.
- Dancers should become aware of their range of movement at a joint, work within that range and thus prevent injury.

#### Movements at joints.

- Flexion – bending at a joint.
- Extension – stretching at a joint.
- Abduction – movement away from the centre line of the body.
- Adduction – movement towards the centre line of the body.
- Rotation – movement around the joint.
- Circumduction – movement in a circle. (used in warm-up for ankle flexibility.)

#### The Hip Joint.

A ball and socket joint. This is the strongest joint in the body, deeply set to give stability and a great range of movement.

**Action** - Out to the side and back to the centre of the body.

Flexion, extension and rotation.

“Turn out”, position of the hips at this joint is vital for SCD technique but will also be controlled by the muscles of the pelvis.

#### The Knee Joint.

To ensure stability, the cruciate ligaments hold the main thigh bone (femur) on the shin bone (tibia). The knee cap (patella) protects this joint and acts to increase the action of the quadriceps (thigh muscles).

**Action** –Flexion and Extension

#### Ankle Joint.

The ankle joint lies between the tibia and fibula (lower leg bones) and talus (large ankle bone). The joint is kept stable by the ligaments on the inside, outside and back of the joint.

**Action** – Plantarflexion and dorsiflexion  
rotation when not weight bearing.

### **Basic Principles for Muscles**

- Muscles are attached by tendons, to the bone, at each end.
- Ligaments join bone to bone across a joint.
- Muscles can only pull.
- Muscles work in opposition, therefore the opposite muscle must relax. For example biceps (front upper arm) – bend the arm at the elbow. Triceps (back of upper arm) – straighten arm at elbow.

**Muscles, ligaments and tendons are usually injured by too sudden a movement, or weak muscles from poor technique. A thorough warm-up will help to reduce these risks. (Refer to [www.rscds.org](http://www.rscds.org) for more information.)**  
**Muscle Function**

Use with reference to Appendices X and XI Major muscle groups.

Head and neck. - Main muscle – sternocleidomastoid

**Action** – Turning head from side to side.

Tilting forward or sideways

**AVOID** backward tilting of neck.

Shoulder joint. - Main muscle – deltoid

**Action** – Raises arms away from the body and to the side (aka abduction).

Arm/elbow. – Main muscles – biceps/triceps

**Action** – biceps – bends elbow. triceps - straightens arm.

(Most elbow extension in SCD is accompanied by gravity.)

Trunk, spine, chest and pelvis. - Main muscles and actions: -

- Abdominals – supports abdominal wall (must keep strong to help lower back).
- Erector spinae – straightens the spine and maintains stable posture.
- Gluteus maximus – extension at hip.
- Hamstrings – extension at hip.

All support posture and alignment.

Hip joint. - Main muscles and actions–

- gluteus maximus (and sartorius - external rotation of hip)
- gluteals - hip extension
- gluteus medius - hip abduction
- iliopsoas - hip flexion
- adductors – hip adduction

Knee joint. – Main muscles and actions -

**quadriceps** -stabilises the joint and extends knee

hamstrings - flexion of knee

Ankle joint. – Main muscles gastrocnemius and soleus (calf muscles).

**Action** – Plantarflex the ankle i.e. point the foot and control the landing of the foot. For example, in pas de basque, skip change and slip step. Important muscles for travelling and setting.

The Achilles tendon is the tendon of the above muscles. It is very vulnerable to injury, if the muscles and the tendon itself are not warmed up.

Foot and toe joints. – Main muscles toe extensors and plantar flexors

**Action** – toe extensors – extends toes. i.e. lifting up away from sole. Flexors to point toes down.

## **Centring the body**

When standing, the centre of gravity is located one or two inches below the navel, in the middle of the pelvis. Centring the body requires total alignment of ankle, knee, hip, shoulder and head. When the line of gravity falls outside the Base of support (BOS), then a reaction is needed in order to stay balanced." It is the powerhouse for: -

- Use of steps.
- Giving of hands and arms.
- All partner and formation work.

## **Centre of Levity**

Use of the force of gravity, by lifting the weight up from the centre of the body, gives a feeling of lightness. The centre of levity improves flight in dancing.

## **Conclusion**

SCD is physically demanding, with complex high impact movement involved in the execution of technique. For dancing, some basic knowledge of how the body works is important. However, it is the ability of the teacher to apply this working knowledge to the presentation of technique and dancing which is crucial. This will ensure safe practice. Hopefully, this brief introduction will motivate further study and enquiry, as teaching skills are developed and applied.