APPENDIX 0

1.0 COMMONLY USED EXERCISES

FORE/AFT DRILLS

The following exercises are some examples of how to develop a skier's fore/aft balance.

EXERCISE – ANKLE FLEXES

Description

- both ankles are flexed evenly fore and aft

Goal

- to develop mobility in the ankle joint
- refine fore/aft balance

Ski Performance – even pressure will be maintained along the length of the ski

- can be done stationary
- while in a straight run
- throughout a turn

Movements of the body

- dorsiflexion closes the ankle joint and applies pressure to the front of the ski boot
- plantarflexion opens the ankle joint and pressure is felt on the back of the ski boot

NB – the flexing of the ankle joint must be complemented by movement in the knee and hip in order to maintain even pressure along the length of the ski

EXERCISE – SHUFFLE TURNS

Description

- both feet shuffle back and forth throughout linked turns

Goal

- to develop mobility while maintaining fore/aft balance
- can be used to highlight a phase of the turn where student is out of balance fore/aft

Ski Performance

- skis should remain parallel throughout the turn. Can be done in a skidded or carved turn

Movements of the body

- shuffle is done by movement of the femur in the hip socket
- flexion and extension movements in the ankle, knee and hip are required to maintain centred stance
- upper body and hand position remain stable

EXERCISE – JUMPING THROUGHOUT THE TURNS

Description

- small jumps are made throughout linked turns
- the whole ski leaves the snow and remains parallel to the snow
- can also be done during straight runs

Goal

- to challenge and refine centred stance
- to develop mobility and co-ordination in leg joints

Ski Performance

- ski must remain parallel throughout the turn
- ski should be parallel to the snow surface
- can be done in a skidded or carved turn

Movements of the body

- the jump is performed by extension and flexion movements of the ankles knees and hips.
- the upper body and hand position should remain stable

EXERCISE – ROCKING FORE/AFT

Description

- the skier shifts balance forward and backward on the skis

Goal

- to develop greater awareness of a centred stance
- to develop the ability to adjust balance along the length of the ski

Ski Performance – pressure will be shifted smoothly along the length of the ski.

- can be done stationary
- while in a straight run
- throughout a turn

Movements of the body

- the centre of gravity moves forward and backward primarily through use of the ankle joint
- the rest of the body should remain stable

EXERCISE – FULL RANGE OF MOVEMENT

Description

- the skier flexes and extends the ankles, knees and hips as much as possible while maintaining a centred stance

Goal

- to explore the range of movements in the leg joints
- to develop the co-ordination of the leg joints
- to develop a centred stance

Ski Performance – pressure will remain even along the length of the ski

- can be done stationary
- while in a straight run
- throughout a turn

Movements of the body

- an appropriate amount of flexion and extension of each leg joint is used to maintain centred stance

EXERCISE – PUSHING AND PULLING ON SKI TIPS

Description

- the instructor pushes and pulls the tips of the students skis fore and aft

Goal

- to develop awareness and use of the muscles required to maintain a centred stance
- can be used to simulate resistance created by variable snow conditions
- student should try to maintain a centred stance on the skis

Ski Performance

- pressure will remain even along the length of the ski

Movements of the body

- muscular engagement of muscles in legs, core and upper body

ROTATIONAL DRILLS

The following exercises can be used to develop a skier's rotational skills

EXERCISE – LEG ROTATIONS

Description

- student balances on one leg and rotates the lifted leg in both directions. Resistance can be applied by the use of a ski pole in the snow or by the instructor holding the students boot

Goal

- to develop leg turning movements
- to develop awareness of the muscles used to rotate the legs

Ski Performance

- with no resistance applied the ski pivots around its centre
- when resistance is applied the ski will remain stationary

Movements of the body

- the whole leg is rotated independently of the rest of the body. The point of rotational separation is the hip socket

NB – The amount of flexion in the leg changes the range of rotational movement. The amount of flexion in the leg also changes which muscles are used to turn the leg and therefore how strongly the legs can be turned

EXERCISE – BOOT WARS

Description

- skiers sit on the snow to stabilise their hips and pelvis. They then interlock their feet, and turn them against each other to create resistance. The position of the feet must change so they can try this in both directions

Goal

- a fun exercise to create muscular awareness in the legs and to stabilise the hips and pelvis

Ski Performance

- none, skis are off!

Movements of the body

- legs are rotated in the hip socket
- slight flexion in both legs
- hips and pelvis remain stable

EXERCISE – STANDING LEG TURNING DRILLS

Description

- there are several activities instructors can do with their students standing on a flat area with skis off.

It is important throughout all of the following drills to focus on rotating the femurs to help develop rotational separation

- pick up one foot at a time and practice turning leg one way then the other
- lightly hold one foot above the snow and turn leg one way then the other so that the shape of a bow tie is left on the snow
- march on the spot, while marching slowly turn feet and legs to point to the side then back to the other side
- turn both feet inward until the toes meet and then turn both legs out so the heels meet
- make small jumps on the spot turning legs back and forth while jumping

Goal

- to develop awareness and mobility of leg turning movements

Movements of the body

- both legs are rotated in the hip sockets under a stable pelvis and upper body

EXERCISE – HOCKEY STOPS

Description

- the skiers ski in a straight line down the fall line, both legs are then turned quickly across the fall line and the skier comes to a stop

Goal

- to develop quicker leg turning and separation

Ski Performance

- skis should pivot around their centre and remain relatively flat to the snow. Edge angle is created by the slope angle

Movements of the body

- both legs are turned in the hip sockets under a stable pelvis and upper body

EXERCISE- PIVOT SLIPS

Description – the skier starts in the fall line and turns both skis quickly across the fall line, then makes a controlled slip sideways before turning the skis 180 degrees in the other direction. The upper body remains stable and facing down the hill. These should be smoothly linked together using a consistent rate of rotation

Goal

- to develop the co-ordination and rate of leg rotation

Ski Performance

- skis pivot at a consistent rate around their centre and remain relatively flat to the snow. Edge angle is created due to the angle of the slope

Movements of the body

- both legs are turned in the hip sockets under a stable pelvis and upper body

EXERCISE – JUMP TURNS OR SPIESS TURNS

Description

- the skier co-ordinates small jumps with leg rotation. As the skier jumps, the skis are rotated across the fall line. These turns and jumps are linked together in one fluid motion

Goal

- to develop athletic ability and co-ordination of vertical and rotational movements

Ski Performance

- the skis should rotate together and pivot around their centre. There should be as little slipping, both sideways and forwards, as possible.

Movements of the body

- flexion and extension movements of the ankle, knee and hip are used to facilitate the balanced jumps. Both legs should rotate in the hip sockets under a stable pelvis and upper body.

LATERAL DRILLS

The following exercises can be used to help develop a skier's lateral movement

EXERCISE – SIDE SLIPS

Description

- the skier stands across the fall line with skis parallel. The edge angle of both skis is reduced causing them to slip sideways. The edge angle is then increased again to stop the slipping

Goal

- to develop the release and control of edges

Ski Performance

- the edge angle of both skis should be gradually increased and decreased by the same amount at all times

Movements of the body

- a lateral movement of the ankles and a rotational movement of the femurs is used under a stable pelvis and upper body

EXERCISE – RAILROAD TRACKS

Description

- on easy green terrain both skis are rolled from one set of edges to the other leaving clean tracks in the snow. Turn shape should be shallow

Goal

- to develop edging movements of the legs and leave two clean tracks in the snow on easy green terrain

Ski Performance

- both skis should be tipped on edge progressively and equally

Movements of the body

- progressive tipping of the ankles, knees and femurs under a stable pelvis and upper body

EXERCISE – STATIC EDGE ROLLING

Description

- on flat terrain skiers practice rolling the skis from edge to edge, focusing on both skis doing the same thing at the same time. Resistance can be applied by holding the skiers knees or placing ski poles in the snow and against the side of the knees

Goal

- to gain greater awareness of lateral movements of the legs and the associated muscles

Ski Performance

- ensure both skis are being tipped progressively and equally

Movements of the body

- ankles, knees and femur move laterally independently of the pelvis and upper body

EXERCISE – LEAPERS

Description

- in the transition the skier jumps from one set of edges to the other

Goal

- to develop lateral balance on and control of the skis edges. This exercise can also develop agility

Ski Performance

- skis should be gripping through the completion of the turn to provide a stable platform to jump from; the edges should then change in the air and land cleanly back on the snow

Movements of the body

- the skier should jump using a quick extension of the ankles, knees and hips. This extension should be directed out of the slope to allow the centre of gravity to pass over the base of support and change the edges

EXERCISE – POLE DRILLS

Description

- the ski poles can be used in many ways to stabilize the upper body laterally, e.g. holding both poles level in front of the body, dragging the outside pole, dragging the outside pole and raising the inside pole and or skiing without poles

Goal

- to develop an awareness of the correct position of the upper body and the associated muscles used. The result should be that the skis are more stable on the snow and the skier will gain better control

Ski Performance

- when the upper body is correctly balanced the skis should grip well and be stable on the snow

Movements of the body

- as the legs move laterally angulation is created in the hip socket. Muscular contraction in the core area along with a slight lateral flexion of the spine towards the outside of the turn is needed to maintain this angulation and keep the skier balanced over the outside ski

EXERCISE - LIFTING OR TAPPING THE INSIDE SKI

Description

- depending on the level of the student the skier can either tap the inside ski on the snow throughout the turn or hold the inside ski off the snow for the whole turn

Goal

- to develop balance over the outside ski and gain better grip and control

Ski Performance

- the outside ski should be edged throughout the whole turn as the inside ski is lifted or tapped

Movements of the body

- angulation in the hip socket and a slight lateral flexion of the spine is used to balance over the outside ski. The ankle, knee and hip joints flex to lift the inside ski off the snow

VERTICAL DRILLS

The following exercises can be used to develop vertical movement; many of the exercises used to develop fore/aft balance can also be used to develop vertical movements, e.g.

- full range of movement
- ankle flexes
- shuffle turns
- jumping throughout the turns

(refer to fore/aft exercises for full descriptions of these)

EXERCISE - EDGE CHANGE WITH FLEXION

Description

- in the transition the skier increases the flexion in both legs as they change edges

Goal

- to allow the centre of gravity to take a more direct path down the mountain and to help release the pressure built during the turn

Ski Performance

- as the skier flexes and the centre of gravity moves over the base of support the edges of the skis should change progressively

Movements of the body

- flexion in the ankles, knees and pelvis is used to help move the centre of gravity across the base of support