Talking about Skiing in 2012 - Use of the Lower Body - Cookie Hale and PJ Jones

There is only gravity and friction shouts the Frenchman! That is all we have to deal with in skiing! Skiing is spiritual! Keep it simple!

What? You need to incline, rotate, angulate with your hips, knees, ankles, head and elbows, you need to be dominant, recessive, retract, soften, steer, dorsi flex, have a strong inside half, snore and above all rotate those femurs in the hip sockets cried the PSIA examiner!

And the poor Austrian was left asking, “You want me to be dominant on my inside leg???? Bah, humbug, this is not possible in the reality of this world!!!” And the Frenchman agreed....

Skiing in 2012 is a fun as ever, as addictive as ever and as simple as ever. What could be more liberating and free than to fly down the hill on skis! What could be more constrictive than to try and discuss ski technique and teaching methodology with the pros! Woe is me..... but here goes!

There is more to skiing than World Cup! or French or American or Korean or....

Keeping it Simple

There is only gravity and friction in skiing? Skiing is about feeling and moving in the forces. Simple. You need to be able to feel the forces, become aware of the sensations, to be able to dance with them. Technically constipated brains inhibit feeling.

What forces? Gravity pulls us towards the center of the earth, or simply put, on a mountainside, it pulls you down the hill. Friction slows us down. We can use our muscles to play with gravity as it pulls us along. We can harness gravity and friction to direct our bodies on skis.

The Concept of Two Me’s - The Skiers Split Personality

Skis are attached at our feet. Our levers controlling the skis are our legs - feet, shins, thighs and hips. Our lower body is designed with certain joints. It functions best when we use it as designed.

Since we also have 2 feet, we need to distribute the weight between them, however, they also need to act together, as a unit, to serve as a base of support.

This is the **lower me** - my feet, shins, thighs and hips.

Sit in a chair with your feet on the ground. Now twist your shoulders and face one side and then the other. Our spine is great at allowing us to twist our shoulders at a different angle to our hips. It is like having a turn table at about our waist. When viewed from the top, our shoulders are not always lined up with our hips and lower body. This is true in skiing.

From the waist up, the shoulders, arms and head, are the **upper me**.

The lower me and the upper me do not always go along the same line at the same time. When using muscles, friction and gravity to scribe somewhat of an arc (a turn) with our skis, often the feet take a longer outside path, while the upper body takes a shorter inside path.

The Lower Body Functions Together as a Unit

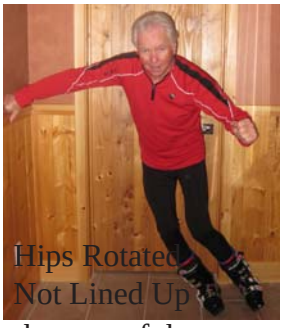
The main structure of our lower body is our bones held together by joints. To have the legs (the shins and thighs) function together without harm, we need to understand the knee joint. It is a simple hinge joint and functions best when used as a hinge joint. While there is some lateral and rotational movement in it (it's a loose hinge joint), the knee works best when we keep the thigh in line with the shin. How we accomplish this is paying attention to how we rotate or counter our hips.

Stand up with both your feet directly under your hips. Bend your knees, staying in balance. See how far you can bend them. Now stand up and rotate your hips either way. Keeping your hips rotated, now try and flex again. See how limited your are in your flexing. Your legs function together better when your hips are lined up with your feet, keeping your thighs and shins in a line - the knee is a hinge joint.


Hips/Knees/Feet Lined Up

Now stand like PJ in the picture to the left. While looking down your legs, play with rotating and countering your hips and see how much you can both flex and "edge" (tip) your feet. It all works best when you keep your legs lined up; i.e. knee between the feet and the hips.


Hips Countered Not Lined Up


Hips Rotated Not Lined Up

While skiing, play with rotating and countering your hips at the bottom of the turn and see how much and how easily you can edge your skis. Using your lower body as a unit, together, bending, unbending, steering and edging your skis, makes it much easier for balancing and requires much less muscle to guide as well as edge your skis.

The Upper Body is Also Disciplined, Guided and Directed

Just as you guide and direct your lower body to ski, you guide and direct your upper body. The concept is very simple. Aim the zipper line of your jacket at where you are going next. Your center of mass is near your belly (sometimes even outside your body). If your goal is to be as efficient as possible, you don't want to have to use any more muscle than you need to ski. Hence, you certainly don't want your CM (center of mass) twisting and/or flopping from side to side.

The Two Me's Take Different Lines

Relative to the forces of a turn, centrifugal forces is throwing us to the outside, so to manage this and stay balanced to the turn forces, we work with centripetal force. If we can stay loose enough, it is fairly easy to feel the forces and keep ourselves lined up with them. However, if we use our brains and try to obtain some position that someone may have been expounding on, we can get all contorted and use a lot of muscular effort to maintain our prized position! Stay loose and go with the force!

If you stay loose, and align yourself to the turn forces, your feet will be on the outside line with your skis, while your upper body will be lined up to the inside, taking a shorter line than your skis. This is not a new concept at all.

PJ: Foragonal and stackitude.

Guiding my upper body forgonally at the top of the turn (the inside line) keeps me balancing to the turn forces over my base of support (the outside line) - i.e. stackitude.

As the two me's go through a turn, my feet get closer and further from my body - I flex and extend. Generally, your feet are furthest from your body at the apex of the turn. It is right after the apex that your body starts moving closer to your feet and starts to move into the next turn, while your feet are still finishing the older turn. The upper body starts the new turn before the lower body. This is accomplished by feeling the turn forces and moving, not by striving for some particular position.

As the body starts to close in on the feet, it is moving more with the turn forces. Therefore, the effect is to reduce the pressure on the skis right where both gravity and centrifugal forces are making the pressure the greatest - at the bottom of the turn.

Ted Ligety Stacked and Balancing

My upper body is moving to the new turn, while my feet are finishing the old turn. I am using this flexing to reduce the pressure on the skis. If I am making a more carved turn, I will also be tipping the skis more to keep them engaged in the snow and holding. At the same time, I am also feeling how much to steer the skis relative to their edge angles to keep them engaged. I feel!

Base of support - stacked, balancing, feeling the forces!

After edge change, my base of support is on the new arc/turn. I can be either flexing or extending at edge change depending on what sort of turn I am making. At the top of the new arc, I also have many choices. I can be actively extending in a foreagonal direction into the new arc and increasing the pressure on the skis at that normally lighter top part of the turn, or I could be still using some of the rebound if I loaded up the bottom of the turn, or I might be making more of a skidding, steered turn and using that lighter top of the turn to help more easily steer a flatter ski or I could be doing a more down unweighted turn with more steering! So many choices. Regardless, my lower body is functioning as a unit and my upper body is being guided and directed along its new path.

To first summarize and simplify - there are two me's, the lower me and the upper me. They take different paths and begin and end their 'turns' at different times. They are coordinated and yet separate. They are coordinated and separated by feeling the forces and moving in them and with them, becoming 'one' with the force - very Zen... Now to the detail of having two feet, not one. How do we get the two feet to act together?

Foot to Foot Pressure Control - Inside/Outside Leg

Stand up with equally weighted feet. Now slowly begin to lift one foot, very slowly, until it finally is off the ground and you are standing on one foot. Now quickly hop onto the other foot. In the first exercise, you gradually and progressively unweighted one foot while you weighted the new foot. In the second, it was a one-two or stepping type motion.

Just as we actively edge and steer our skis, we also actively distribute the pressure between them. The weight distribution flows from one foot to the other continuously and progressively with the outside ski always being dominant. We are usually about 50/50 at edge change, which means that we need to begin to move weight to what will be the new outside ski, right after the apex of the turn while we are flexing. I think of it as this, when I begin to flex, I also begin to transfer more weight to the new outside ski - the current inside ski.

The overall maximum weight distribution to the outside ski varies with the terrain, the snow conditions, the turn shape, the speed and just what our desired outcome is. Sometimes it is almost 99/1 in a high speed GS turn where the inside ski is tracking mainly due to the angles that we are creating. However, that is mainly world cup style skiing. Most of the time, in recreational skiing, it is 70/30 or 60/40.

Regardless, in most modern style skiing, we are more two-footed and progressively and continuously transferring weight between our skis; we are not stepping, or picking up the inside ski as used to be common and popular. We are also weighting the outside ski right after edge change to pressure and shape the top of the turn; we are not waiting until after the apex/falline to weight the outside ski.

PJ - Two-footed, feeling the forces, stacking with them and going with them!

PJ's History on the Use of the Inside Leg

1966 - Pepi Stiegler, The Style of a Champion: The inside leg was active basically to promote early weight shift and to change the shape of the turn by skating. Engaging the inside ski in a skating movement to get early on the new outside ski. When you start the movement, it is the inside ski. This is to control turn shape.

1974 - Two-footed turns with Junior Bounous, turning and flexing to decrease the pressure in soft snow. This was for early weight transfer and to move with the skis.

1978 - Skiing An Art, A Technique by George Joubert, braquage, two-footed pivot with down motion almost identical to what Junior was doing. Again the idea was to transfer the weight early and control the shape of the turn.

1980 - PSIA Demo Team Training, Lake Eldora, Colorado: My biggest change in my skiing. Open stance, two-footed parallel turn. Reference Ingemar Stenmark and Hans Enn. Point of view was early weight shift and turn shape.

1981 - Head Ski Company, first parabolic public ski offering, Natural Easy Carve, Heavenly Valley, Stu Campbell, Peter Duke. The public was not ready! This notes the change in equipment that effects how we use the inside leg - much easier with parabolic skis!

1983 - Interski Sesto (Sexton), Italy: Austria inside leg activity and uses. The inside ski is an integral part of each turn. Franz Hoppichler. France super parallel, open stance, two-footed, high performance - skiing on classic straight skis that was very similar to today's skiing. This was the beginning of the continuous weight transfer or flow movement, the internalized weight transfer that is both legs always actively engaged with the weight distribution continuously and progressively flowing between them; i.e. up one leg and down the other.

The French in 1983. Very Two-footed.

1985 - Cybervision. Open stance, two-footed parallel turns, Jens Husted with sister silk, Chris Ryman, who was more one-two, picking up the inside ski with more pivot. Jens had more shape with rounder turns. Jens was more two-footed.

1988 - 3M Company, The Parallel Turn: The Mountain Playground, PJ Jones. Both one-two turn action and two-footed turn action with focus on upper, lower body coordination, not separation.

1991 - Elan introduces parabolic skis to the general market.

1992 - The rest of the world ski producers offer parabolic skis.

Note: The use of the inside ski was always directed towards the goal of getting on the new outside ski earlier - early weight transfer, to be used for pressuring and shaping the top of the turn more.

1995-2012 - At this time, we in the ski industry, failed ourselves by not writing new definitions for ski technique to match our understanding with the changes in equipment. (Modern terms that denote turn shape relative to the use of the inside ski are stackitude, finishiation, foragonal.)

Out with the Olde Terms	**In with the New Terms**
Angulation	
Hip angulation, Knee angulation	Direction, Duration
Upper body angulation	Intensity, Accuracy
Counter, Rotation, Anticipation	Timing
Up/Down	Foragonal
Upper/lower separation	Upper/lower coordination
Weight shift	Continuous weight flow
Initiation/Edge Change	Finishiation
Position	Feel the forces
Edge change can be weighted/unweighted, flexing/extending/retracting	

Check out these videos and look for two-footed carving....

Ted Ligety Slalom: http://youtu.be/PKFT4WNiqc8

Ted Ligety GS: http://youtu.be/WU3ujBvpR8M