

Technical Statement

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Pressure in the fall line, Shortest path of the Center of Mass, Reducing Drag are the three corner stones to fast ski racing. Of these corner stone principles one or two will be more important than the others depending on the situation. How the athlete expresses himself to achieve these corner stones is the cumulative effect of strategy, tactics and fundamentals with fluid rhythm and timing. The athlete who executes the corner stone's most effectively while adapting to the situation is the one who wins.

Pressure in the fall line:

Center of mass of the skier is redirected while the skis are in the fall line.

Shortest path of the Center of Mass:

In most situations, a shortest distance is faster. There are some situations where skiing a rounder line is advantages to maintaining velocity. In principal, a more direct route while balancing the other corner stone's is faster.

Reducing Drag:

Ski snow interaction can cause great differences in drag. For sure the skis should be as clean as possible but a far greater focus should be on reducing drag instead of just saying arcing or carving. Sliding and / or steering the ski in different ways has a great variety on the amount of drag. Steering the skis, (at lower edge angle / over a shorter distance / on two feet), into the fall line minimizes drag but increases adaptability for the athlete to express themselves.

Aero dynamic drag is part of the equation especially as speed increases. Consistency of hand and arm positions are far more important than just low tuck position when assessing overall drag relationship in a complete run.

The athletes who expresses themselves in the most adaptable manner are the ones who are balanced. The simplicity of being balanced on the outside ski is clear and paramount. The fundamentals of skiing allow the athlete to find and maintain balance in the greatest variety of situations.

A far greater detailed focus on apex position is critical to long term development. When focusing on Apex Position, we see clear and consistent fundamentals among all great racers at the highest level. From Apex to Apex (completion, transition and initiation) the "technique" or "style" varies greatly depending on situation.

Coaching with high expectations that our athletes are going to be adaptable requires proper ingraining of the fundamentals into the central nervous system. In competition, these fundamentals will flow subconsciously as, habit.

Fundamentals of ski racing:

Balanced athletic stance (throughout the whole turn):

The athlete can move at any time in any way he or she wants to. The movements of all joints are fluid. Each leg works independently. Knees and hips move together. Ski the ski tip to tail while hips (center of mass) are over the feet.

Essential - Apex- The hips are over the feet.

Goal - Initiation – the hips are in front of feet

Outside ski to outside ski: active weight transfer

Turns are made while balanced on the outside because athletes are much stronger in this position. Having a deliberate active weight transfer from one foot to the other at some point between the apex's leads to far more balanced athletic skiing compared to a passive weight transfer. Where the active weight transfer occurs, all depends on the situation.

Upper body discipline: Pelvis to shoulders

The legs turn more and work independently of the upper body. For balance to be maintained and allow for the legs to be effective, upper body must maintain stability.

Apex – hips and shoulders are level and facing fall line. Being critically detailed here is important.

Completion – hips and shoulders are level and facing the fall line (square)

Of note: – the legs turn more than the upper body. Therefore, there is upper and lower body separation. Only in a true glide turns or very easy section is the pelvis really following the skis. A strong inside half is seen in all good turns.

Lower leg engagement: Feet, ankles and knees make the turn with tension

Athletes feel and are connected to the ski and/or edge

Knee angulation to establish the platform comes from an internal rotation of the femur in the pelvis. Establishing the platform from the bottom up is a critical point often overlooked.

Snow Contact:

Maintaining ski snow contact is critical to make turns efficiently and effectively. There are three main types of transitions are all used in elite skiing in every run. The effective use of the transitions is completely subconscious effort based on the situation. The three transitions are: Up unweight, down unweight and performance

Pole Plant:

Athletes have and use the three types of pole plants (tap, plant and block) when skiing Slalom. This fundamental skill is critical for moving smoothly through to the World Cup podium.

Advice

Movement – apex to apex

To link balanced turns from Apex to Apex we see a clear movement of the inside shoulder / hip moving forward all the way to the next apex. At the apex is where this forward movement changes from one side to the other deliberately. Strong inside half movement does help release the ski by taking the momentum from one turn into the other.

Releasing the ski (*releasing the pressure on snow “bend in ski” / turning effect*) is a critical component of ski racing. *How do we develop a better language and dialog as a nation?* Achieving the corner stones of fast ski racing, going down the hill is most important. Thus, the importance of releasing the skis! Where and how much the skis are released is all situational *There is distinct difference between continuing to turn and releasing the ski while often staying on the ski to have rhythm and timing. Pressure (turning effect) on the ski should be released as soon as the athlete has redirected the center of mass just enough to make the next turns (exit angle) but often stays on the edge a while longer to link the turns. How an athlete releases the ski efficiently is situational. It can be done by the following individually or in combination: active weight transfer, movement forward (which decreases hip angulation), externally rotation of the femur of the outside leg, flexion of the outside and / or inside leg and lastly internal rotation of the inside femur. **Let the ski go down the fall line. Keep the skis in the fall line***

Establishing the platform from the ground up is done deliberately as early and quickly in the turn as possible based on the situation. Where it occurs, and can occur is all dependent on the situation. One of the clear distinctions of where it happens depends on if a short steer or clean carving at the top of the turn is used.

In carving - The quicker and earlier platform is established, relative to what's possible, usually makes the corner stone's achievement at a far higher rate. Minimal edge angle is needed. Just balance on it so there is something to stand on.

In a steered top of turn the establishment of a platform from the ankle knee (via internal femur rotation) should be closer to the apex so that it's closer to the point where a carve can be caught. This does several things: 1- minimizes the time sliding 2- allows for less edge angle while sliding, 3- weight can be distributed on both feet potentially 4 – Easier to make sure the CM is still going towards the apex.

NOTE – there is a clear difference in drag affect between steering the ski by femur rotation into the fall line to cheat the radius and what has been called stivotting. Stivotting's only effective use is speed control and maybe to help get back in balance. Speed control may be necessary to maintain the overall average speed in a course. Steering into the top of the turn is a basic skill.

FULL Circle

The ability to consistently execute “establish the platform” or “catch the ski” or “pick up the ski” or “l’apuri” (all saying the same thing) in a wide variety of situations all goes back to the FUNDAMENTALS! It’s just the blending of:

- 1- Balanced athletic stance!!!
- 2- Snow contact – no matter the transition type
- 3- Outside ski to outside ski - active weight transfer
- 4- lower leg engagement – internal femur rotation

Rhythm and timing struggles are caused by starting the turn too early (*pinching / too early / not deep enough / not going to the wall*). There is a distinct difference between establishing the platform and starting the turn. The key is to establish the platform from ankle knee only, while the center of mass is still traveling forward in the direction of travel (or in the direction of the next apex). The platform is established while the CM is over the skis. It’s about balance on the new inside edge of the outside ski. *It has nothing to do with high edge angle!* The CM must move deeper or to the wall. It takes courage to go deeper in the turn with the CM before creating any hip angulation because of several reasons: 1- most athletes do not establish the platform from the ankle knee and without a platform their way to get ski on edge is hip angulation first. This moves the CM inside way too early making them out of balance. 2- it illogical to the brain to have bring CM to the right to make a left turn or visa versa when rushed. Skiing to the wall is just a teaching cue as is skiing deep. *The wall is a visual representation of where the pressure should be. To give a visual cue where to go and push against it. If you are going to jump off a wall you will bring your hip to the wall. This is a teaching cue just like going deep or the blue branch line. The goal is to get the athletes to have a better timing relative to the fall line and the gate.* When our athletes quickly establish the platform from the bottom up and are better timed when they start the turn; they are going to be in better BALANCE!

Turn shape and placement concepts

Turn shape diagrams should be used to demonstrate this.

In general, we are searching for 50/50 turns meaning that the apex is at the gate. Occasionally this moves slightly up or down based on the situation.

Straighter or more direct an athlete’s goes the deeper they must go to still put the pressure in the fall line.

Most athletes get late because they start the turn too early NOT because they go too straight. Are you in balance if the turn is started too early? Get balanced.

Using the center of mass efficiently through athletic position and movement.

The Swing affect

Apex – (turning)

Objective = Hip are directly over feet.

Teaching Cues = extend hip joint, push, long leg, strong inside half, drive shoulder up and forward, high hip

Outcome = efficient position to take forces and transfer momentum to the other direction

Completion-

Objective = Skiing the tail of the ski, feet can be **slightly** ahead in certain situations of the hip

Teaching cues: ski tip to tail, let the outside leg flex and turn knee out.

Outcome = releasing the skis while maintaining the momentum direction of travel needed for the rhythm and timing of the course. This can also be used to cheat the turn by bending the back part if needed.

Initiation –

Objective = Hips are in front of feet

Teaching cues: Push on the snow behind you, feels like pedaling a bike backwards, pull your feet behind you, flex knee but extend hip joint.

Outcome: CM is balanced against the front of front of ski. Bending the front of the ski more than rest of the ski which will make the ski pull more radius with less edge angle. Athlete has the potential to get CM to start to change direction prior to the fall line.

In the end the CM is forward and back on the skis from top to bottom of the turn. Just like standing on a swing.

The pump affect

Just like pumping a half pipe or pump track. Flex in transition and extend in apex. Just as you would pump a swing.

Skills:

Edging – Knee angulation, hip angulation, inclination

Pressure – Flexion / extension, weight transfer, increase / decrease edge angle, increase / decrease turn shape, carve vs sliding.....

Rotary – steering, pivoting, “rotation”, routour vissage

How these fit in a technical statement??? What’s the importance? For sure the terms should be understood and defined.. We get our selves confused between fundamentals and skills often.

*Does it help the teaching process when we confuse ourselves? We already have a mess when teaching cues become technique or fundamentals. **DEBATE***

Our drills in education should be classified by fundamentals to make this whole understanding simpler.

Commentary:

There is talk out there of High edge angle at top of turn..... Where is the balance? Focus must be on active weight transfer, balance athletic position (hip position) all to be in balance on the new outside ski. Athletic Balance from one foot to the other foot.

Parallel Position “kill the term”

Or keep it in the desk when talking about glide turns.

Most athletes across the country are hooking. At the development level athletes - exit angle is too high at the bottom of the turn. They do this to either ski a rounder line or move the apex higher relative to the gate than what is needed. They can release the ski sooner and ski a tighter line. We need to challenge all our eyes and understanding what is possible.

Terms:

Flexion

Extension

Steering