



## **Outline**

Skiing is an extremely athletic sport. As athletes you move at high speeds creating great forces and must be able to react quickly. Skiing is also extremely demanding on the cardiovascular systems with courses ranging from 40 seconds to over 3 minutes at the international level. Most importantly, being strong and fit allows you to ski faster, reduces injury, and increases coordination in other sports.

This program should be seen as a guide for your training. All sports from skydiving to bowling are effective training for skiing, but the key is you hit all the basic training elements. So if you are playing soccer 3 times a week you need to still be hitting the gym and maintaining core strength.

The strength session were developed by myself and the Nevada Athletic Trainers. It is important you follow the lifting progression; in general if you miss a session just start at the session you missed and add a day on the end. Technique is important and I am free to assist.

Use the personal weekly schedules to track your work outs so you can easily find which types of sessions you are missing.

Go Fast--Have fun!

-Evan

## **Summer Training Goals**

1. Develop cardiovascular efficiency
  - A solid aerobic base allows for higher intensity training and faster recovery
2. Increase strength
3. Increase core strength
  - Core strength is the key to power, coordination, and injury prevention. Focus on the core is especially important if you've encountered back problems.
4. Coordination
  - Play sports! Ride your bike.



## Strength

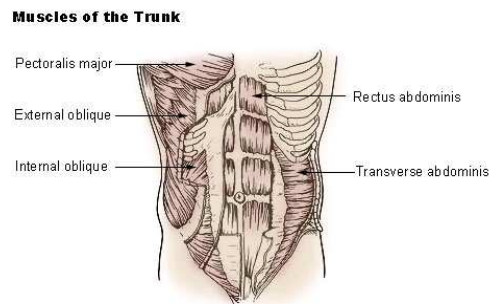
- Strength workouts can be completed in 1-1.5 hours including warm up.
- “Super set” columned exercises with 2-3 minutes recovery between each exercise.
- Again, these sessions should be seen as a guide. The lifts listed are straightforward and the base of increased ski specific strength. If you are comfortable with these exercises, feel free to get into more complex and specific lifting.
- Strength sessions will be sent out every two weeks.
- **Recovery: Getting on the bike for a “pulse recovery” (see recovery below) will significantly increase your recovery time. Try it out.**



## Core

Be creative with building core strength. Sit ups and back extensions are useful for building general strength but less so for functionality. The more exercises you can do incorporating ski specific movements (twisting, stabilization, etc) the better. Your sessions should include swiss balls, med balls, jumps, free weights, etc. Sessions should last from 5 minutes to an hour.

Perhaps most importantly (besides just doing the exercises), you need to be activating your transverse abdominals (TA). These muscles are the key to functional core strength



### ***The muscle [transversus abdominis] in movement and training***

The most well known and effective method of strengthening it is the vacuum exercise, as well as engaging it during lifts. The transversus is the body's natural weight-lifting belt, stabilizing the spine and pelvis during lifting movements. Failure to engage the muscle at higher intensity lifts is dangerous and encourages injury. It acts as a girdle or corset in creating hoop tension around the midsection, tensing before contraction of the extremities.

Without a stable spine, the nervous system fails to recruit the muscles in extremities efficiently, and functional movements cannot be properly performed.<sup>[citation needed]</sup> Stabilization must then occur at the segmental level. The transversus abdominis and the segmental stabilizers of the spine are designed to work in tandem. This kind of lifting eventually overloads segmental stabilizers, and can result in massive lower back pain, early degeneration and many orthopedic problems.

[http://en.wikipedia.org/wiki/Transversus\\_abdominis\\_muscle](http://en.wikipedia.org/wiki/Transversus_abdominis_muscle)

If you are still confused, then sign up for a Pilates class. Bellow are several options for workouts.



GENERAL CORE/STRENGTH

1st Pass

2nd Pass

3rd Pass

| Time | Exercise                     | Time | Exercise                                      | Time | Exercise                  |
|------|------------------------------|------|---|------|---------------------------|
| :45  | Pushups                      | 1:00 | Rest  | 1:00 | Rest                      |
| :15  | Rest                         | :45  | Pushups                                       | :45  | Pushups                   |
| :45  | in-and-out-situps            | :15  | Rest  | :15  | Rest                      |
| :15  | Rest                         | :45  | in-and-out-situps                             | :45  | in-and-out-situps         |
| :45  | Up Downs                     | :15  | Rest  | :15  | Rest                      |
| :15  | Rest                         | :45  | Up Downs                                      | :45  | Up Downs                  |
| :45  | Bench Dips                   | :15  | Rest  | :15  | Rest                      |
| :15  | Rest                         | :45  | Bench Dips                                    | :45  | Bench Dips                |
| 1:00 | TV Watchers                  | :15  | Rest  | :15  | Rest                      |
| :15  | Raise Right Leg              | 1:00 | TV Watchers with feet on bench                | 1:00 | TV Watchers               |
| :15  | Raise Left Leg               | :30  | hips flat with lateral movements side to side | :30  | Raise Right Leg           |
| :30  | Rest                         | :30  | Rest  | :30  | Raise Left Leg            |
| :45  | Wide Pushups                 | :45  | Diamond Pushups                               | :30  | Rest                      |
| :15  | Rest                         | :15  | Rest  | :45  | Rest                      |
| :45  | Tuck Jumps                   | :45  | Tuck Jumps                                    | :45  | Wide Pushups              |
| :15  | Rest                         | :15  | Rest  | :15  | Rest                      |
| :45  | Fire Hydrants Right Leg      | :45  | Fire Hydrants Right Leg                       | :45  | Tuck Jumps                |
| :15  | Fire Hydrants Left Leg       | :45  | Fire Hydrants Left Leg                        | :15  | Rest                      |
| :45  | Rest                         | :15  | Rest  | :45  | Fire Hydrants Right Leg   |
| :30  | Bicycle Forward              | :30  | Bicycle Forward                               | :45  | Fire Hydrants Left Leg    |
| :30  | Bicycle Back                 | :30  | Bicycle Back                                  | :15  | Rest                      |
| :30  | Hip Thrusters                | :30  | Hip Thrusters                                 | :30  | Bicycle Forward           |
| :30  | Knee-Hugger Situps           | :30  | Knee-Hugger Situps                            | :30  | Bicycle Back              |
| :30  | Vertical Scissors            | :30  | Scissors on right side                        | :30  | Hip Thrusters             |
| :30  | Legs Up and Down Together    | :30  | Scissors on left side                         | :30  | Knee-Hugger Situps        |
| :30  | Kayakers                     | :30  | Legs Up and Down Together                     | :30  | Scissors on right side    |
| :30  | Rest                         | :30  | Kayakers                                      | :30  | Scissors on left side     |
| :30  | Bird Dogs Left Arm/Right Arm | :30  | Rest  | :30  | Legs Up and Down Together |
| :30  | Bird Dogs Right Arm/Left Arm | :30  | Superman                                      | :30  | Kayakers                  |
|      |                              |      |   | :15  | Rest                      |
|      |                              |      |   | 2:00 | Shoulder Bridge           |



## **Aerobic**

Aerobic Training is often defined as a % of max heart rate. This does not always give the right value for YOU. Make sure that you concentrate on training according to the lactic threshold, or the point where the body is in an equilibrium producing and processing lactic acid.

### **Definition of Training**

Level 5 = HR 95-100 % or above threshold

Level 4 = HR 90-94 % or just below 97% - 100% threshold

Level 3 = HR 85-89 % or well below 93% - 97% threshold

Level 2 = HR 75-84 % or 65% to 75% of threshold

Level 1 = HR 65-74 % or 55% to 65 % threshold

## Steady state aerobic sessions

**Intent:** *Build volume – Steady state aerobic efficiency*

|                 |  |
|-----------------|--|
| <b>Workout:</b> | Bike, Rollers, Roller Blade, Run, Swim etc |
|-----------------|--|

### Session Aims

- Improve efficiency and work load during aerobic steady state work

### Weekly Outcomes

- If possible, the series should be progressed every 2-3 weeks.

| PROGRESSION 1   | SETS & REPS  | COOL DOWN                           | SUMMARY                            |
|---|--|-------------------------------------|------------------------------------|
| <u>Warm-up</u><br>5 mins easy (Level 1 HR)<br>2 mins moderate (Level 2 HR)<br>1 min steady (Threshold HR)<br>2 mins easy (Level 1 HR) | 2 x 10 mins HR at threshold HR<br><br>Record time to HR less than level 1 HR & 10 mins easy between sets | Warm down 10 mins easy (Level 1 HR) | N/A<br><br>Total session = 50 mins |
| PROGRESSION 2   | SETS & REPS  | COOL DOWN                           | SUMMARY                            |
| <u>Warm-up</u><br>5 mins easy (Level 1 HR)<br>2 mins moderate (Level 2 HR)<br>1 min steady (Threshold HR)<br>2 mins easy (Level 1 HR) | 1 x 15 mins HR at threshold HR<br><br>Record time to HR less than level 1 HR                             | Warm down 10 mins easy (Level 1 HR) | N/A<br><br>Total session = 35 mins |
| PROGRESSION 3   | SETS & REPS  | COOL DOWN                           | SUMMARY                            |
| <u>Warm-up</u><br>Repeat  | 1 x 20 mins HR at threshold HR<br><br>Record time to HR less than level 1 HR                             | Warm down 10 mins easy (Level 1 HR) | N/A<br><br>Total session = 40 mins |
| PROGRESSION 4   | SETS & REPS  | COOL DOWN                           | SUMMARY                            |
| <u>Warm-up</u><br>Repeat  | 2 x 15 mins HR at threshold HR<br><br>Record time to HR less than level 1 HR & 10 mins easy between sets | Warm down 10 mins easy (Level 1 HR) | N/A<br><br>Total session = 60 mins |

### NOTES

- ❖ The key to this session is relaxed rhythmic work and staying focussed on your work intensity – work with your heart rate NOT load so if there is a hill drop back the intensity or you will not recover to within the desired load (don't worry if your HR creeps up 5-10bpm for a short 1-2 min period but make sure it doesn't stay elevated for longer than 2 mins or you will not be working the desired energy system!)
- ❖ Progress to the next level only when your HR drops below level 1 **less than 1 min after steady state.**
- ❖ Altitude will increase the time needed for recovery. Take your time and drop back to previous progression if necessary.

## Steady state aerobic sessions 2

**Intent:** *Build volume – Steady state aerobic efficiency*

|                 |  |
|-----------------|--|
| <b>Workout:</b> | Bike, Rollers, Roller Blade, Run, Swim etc |
|-----------------|--|

|  |
|--|
| <p><b>Session Aims</b></p> <ul style="list-style-type: none"> <li>➤ Improve efficiency and work load during aerobic steady state work</li> </ul> |
|--|

|   |
|---|
| <p><b>Weekly Outcomes</b></p> <ul style="list-style-type: none"> <li>➤ If possible, the series should be progressed every 2-3 weeks.</li> </ul> |
|---|

| PROGRESSION 5.  | SETS & REPS   | COOL DOWN                                  | SUMMARY                        |
|---|---|--|--------------------------------|
| <p>Warm-up<br/> <i>5 mins easy (Level 1 HR)</i><br/> <i>2 mins moderate (Level 2 HR)</i><br/> <i>1 min steady (Threshold HR)</i><br/> <i>2 mins easy (Level 1 HR)</i></p> | <p>2 x 20 mins HR at threshold HR</p> <p>Record time to HR less than level 1 HR &amp; 10 mins easy between sets</p>               | <p>Warm down 10 mins easy (Level 1 HR)</p> | <p>Total session = 70 mins</p> |
| PROGRESSION 6   | <p>3 x 15 mins HR at threshold HR</p> <p>Record time to HR less than level 1 HR &amp; 10 mins easy between sets</p>               | <p>Warm down 10 mins easy (Level 1 HR)</p> | <p>Total session = 85 mins</p> |
| PROGRESSION 7   | <p>1 x 30 mins HR at threshold HR</p> <p>Record time to HR less than level 1 HR</p>   | <p>Warm down 10 mins easy (Level 1 HR)</p> | <p>Total session = 50 mins</p> |
| PROGRESSION 8   | <p>1 x 30 mins HR at threshold HR, 10 mins easy, 1 x 15 mins HR at threshold HR</p> <p>Record time to HR less than level 1 HR</p> | <p>Warm down 10 mins easy (Level 1 HR)</p> | <p>Total session = 75 mins</p> |

| NOTES | <ul style="list-style-type: none"> <li>❖ The key to this session is relaxed rhythmic work and staying focussed on your work intensity – work with your heart rate NOT load so if there is a hill drop back the intensity or you will not recover to within the desired load (don't worry if your HR creeps up 5-10bpm for a short 1-2 min period but make sure it doesn't stay elevated for longer than 2 mins or you will not be working the desired energy system!)</li> <li>❖ Progress to the next level only when your HR drops below level 1 HR <b>less than 1 min after steady state run.</b></li> <li>❖ Altitude will increase the time needed for recovery. Take your time and drop back to previous progression if necessary.</li> </ul> |
|-------|---|
|-------|---|

## INTERVAL SESSION

|   |   |  |
|---|---|--|
| <p><b>Workout:</b> HILLS – RUNNING / BIKE (STEPPER CAN BE USED IF INJURY IS AN ISSUE)</p> <p><b>Session Aims</b></p> <ul style="list-style-type: none"> <li>➢ Increase anaerobic tolerance and buffering capacity.</li> </ul> <p><b>Weekly Outcomes</b></p> <ul style="list-style-type: none"> <li>➢ If possible, the series should be progressed every 2-3 weeks</li> <li>➢ Keep all repetitions within 10% of first effort!!</li> </ul> |   |  |
| <b>PROGRESSION 1</b>  | <b>COOL DOWN</b>  | <b>SUMMARY</b>                               |
| <p>30 - 60 secs HARD: 2 mins easy: 30 - 60 secs HARD</p> <p><b>10 mins recovery easy A1 HR</b></p> <p>30 - 60 secs HARD: 2 mins easy: 30 - 60 secs HARD</p> <p><b>10 mins recovery easy A1 HR</b></p> <p>30 - 60 secs HARD: 2 mins easy: 30 - 60 secs HARD</p>  | <p>Full 20 mins recovery including:</p> <p><b>5 mins A2</b></p> <p>5 secs ONLY: Hard Effort</p> <p>55secs V.LIGHT recovery</p> <p>Repeat this <b>5</b> times TOTAL</p> <p><b>5-10 mins A1</b></p> | <p>TOTAL SESSION:</p> <p>Approx. 90 mins</p> |
| <b>PROGRESSION 2</b>  | <b>COOL DOWN</b>  | <b>SUMMARY</b>                               |
| <p>60 - 90 secs HARD: 2 mins easy: 60 - 90 secs HARD</p> <p><b>10 mins recovery easy A1 HR</b></p> <p>60 - 90 secs HARD: 2 mins easy: 60 - 90 secs HARD</p> <p><b>10 mins recovery easy A1 HR</b></p> <p>60 - 90 secs HARD: 2 mins easy: 60 - 90 secs HARD</p>  | <p>Full 20 mins recovery including:</p> <p><b>5 mins A2</b></p> <p>5 secs ONLY: Hard Effort</p> <p>55secs V.LIGHT recovery</p> <p>Repeat this <b>5</b> times TOTAL</p> <p><b>5-10 mins A1</b></p> | <p>TOTAL SESSION:</p> <p>Approx. 90 mins</p> |
| <b>PROGRESSION 3</b>  | <b>COOL DOWN</b>  | <b>SUMMARY</b>                               |
| <p>90 - 120 secs HARD: 2 mins easy: 90 - 120 secs HARD</p> <p><b>10 mins recovery easy A1 HR</b></p> <p>90 - 120 secs HARD: 2 mins easy: 90 - 120 secs HARD</p> <p><b>10 mins recovery easy A1 HR</b></p> <p>90 - 120 secs HARD: 2 mins easy: 90 - 120 secs HARD</p>  | <p>Full 20 mins recovery including:</p> <p><b>5 mins A2</b></p> <p>5 secs ONLY: Hard Effort</p> <p>55secs V.LIGHT recovery</p> <p>Repeat this <b>5</b> times TOTAL</p> <p><b>5-10 mins A1</b></p> | <p>TOTAL SESSION:</p> <p>Approx. 90 mins</p> |



Get the lactate out!

Pulse Recovery

Bike

1. 5 minutes with HR L-2, 90-100RPM
2. 10 minutes continued at HR L-1 with 5 second maximum pulses every minute
3. 5 minutes with HR L-2

You'll find you need to ride with a higher sustained heart rate than you might believe. Think about getting the lactate out of your muscles and into your blood (pulses). You should feel the burn. Your aerobic system (A-2) will then use the lactate as energy and clear legs of acid. Sessions should be extended until legs are "cleared".

Non-scientific article about lactate:

[http://findarticles.com/p/articles/mi\\_qa3871/is\\_199807/ai\\_n8794451/pg\\_1?tag=artBody:col1](http://findarticles.com/p/articles/mi_qa3871/is_199807/ai_n8794451/pg_1?tag=artBody:col1)

# General Flexibility

## Session Aims

- Improve and maintain overall flexibility.

## Description of Session

- By learning this routine by heart, you will see that it progresses very smoothly from one stretch to the next.
- If you perform this routine before explosive exercise or skiing, don't hold the stretches for 30 seconds. Just hold each stretch for about 6x5 seconds.
- If you perform this routine after training, hold each stretch for 30 seconds.

## Warm-Up

- Aerobic Warm-Up - 10 minutes, if you intend to perform just flexibility

## Cool Down

- This session can serve as a cool down after most training sessions

## Session Outlines:

|   |   |                                |
|---|---|--------------------------------|
| ➤ | Hamstrings Stretch - Spread Feet, Hang to the middle                              | x30 sec or 6 x 5 sec           |
| ➤ | Hamstring Stretch - Spread Feet, hang toward each foot                            | x30 sec or 6 x 5 sec each side |
| ➤ | Sumo Squats   | x30 sec or 6 x 5 sec           |
| ➤ | Hamstrings Stretch - Feet together, hang to the feet                              | x30 sec or 6 x 5 sec           |
| ➤ | IT Band Stretch - Right foot over left, lean to the left and reach, or vice versa | x30 sec or 6 x 5 sec each side |
| ➤ | Hip Flexor quadriceps stretch - Kneeling hip flexor into quad stretch             | x30 sec or 6 x 5 sec each side |
| ➤ | Kneeling Hip Flexo Stretch  | x30 sec or 6 x 5 sec each side |
| ➤ | Kneeling Hip Flexor with Quadriceps stretch                                       | x30 sec or 6 x 5 sec each side |
| ➤ | Seated Groin Stretch - "Butterfly"  | x30 sec or 6 x 5 sec           |
| ➤ | Seated External Rotator and Glute Stretch - Seated "Pretzel"                      | x30 sec or 6 x 5 sec each side |
| ➤ | Side Lying Quadriceps Stretch   | x30 sec or 6 x 5 sec each side |
| ➤ | Side Lying IT Band Stretch - Straight Leg Across Body                             | x30 sec or 6 x 5 sec each side |
| ➤ | Prone Chest Stretch   | x30 sec or 6 x 5 sec each side |
| ➤ | Prone Posterior Shoulder Stretch  | x30 sec or 6 x 5 sec each side |
| ➤ | Quadrapped Lat Stretch  | x30 sec or 6 x 5 sec each side |



We will test at the beginning and end of the Conditioning period. Testing will be much more effective if you are familiar with the test protocols. Use the scoring tables as a baseline for your training.

|    |                   | Sep 08 | Nov 08 |
|----|-------------------|--------|--------|
| 1  | Back Squat        |        |        |
| 2  | Clean             |        |        |
| 3  | Bench Press       |        |        |
| 4  | Weighted Pull Ups |        |        |
| 5  | Weighted Sit Up   |        |        |
| 6  | Shuttle Run       |        |        |
| 7  | Vertical Jump     |        |        |
| 8  | 5xForward Jump    |        |        |
| 9  | 60 sec Box Jump   |        |        |
| 10 | Core Function     |        |        |