Accelerate Your Body EFFICIENTLY



Adolescent workouts should repeat efficient strength

:

not just more strength.

We strength coaches have allowed pseudo-science to over-sell weight training to teen-age males. They're an easy sell.

Yes, strength is very important, some of it with weights, but training must not oppose laws of physics, or relexes of our physiology.

Sprinting and skating are whole-body movements, not lower body movements.

Teen-ager Natalie Darwitz sprinting toward a Hall-of-Fame career

What can we learn from this photo?

Why will the nearest sprinter in the photo win the short 10m race of acceleration, if not the longer race?

Efficiency



He reaches a position of

Forward Lean

with

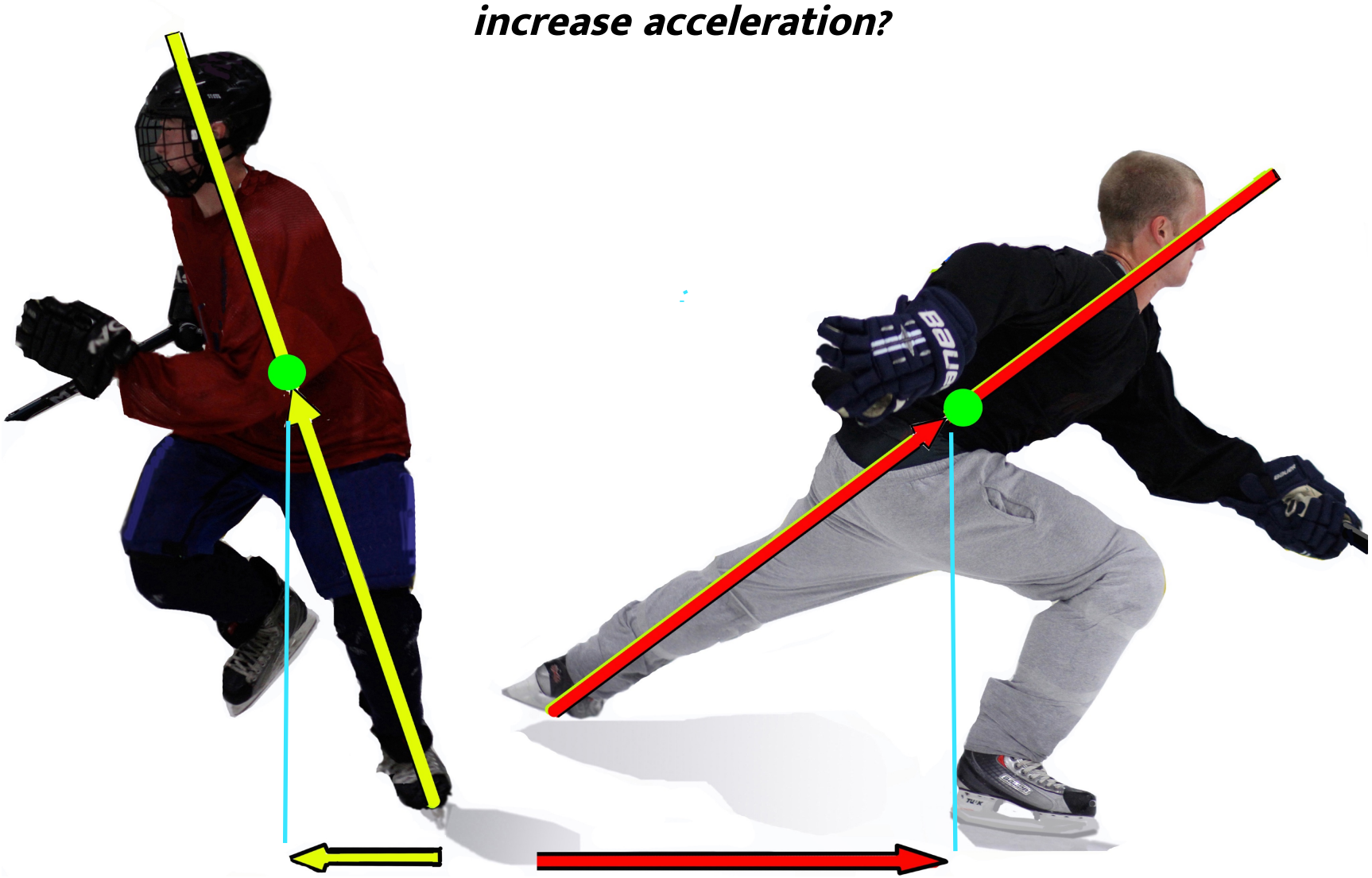
Straight Line eXtension

before others

Efficient force application is essential for maximum acceleration and must be learned while the nervous system is refining rapidly.

Strength and Speed training during adolescence must include drills that teach the feeling of straight line extension.
Most one-legged jumps do this when the athlete knows the goal is to elevate the head as high as possible.

How does efficient force increase acceleration?



The one with greater *horizontal component* of force is the winner

Same bantam in both photos, but after 6 weeks of dryland training, acceleration in his first step is much greater, because his nervous system learned to use strength efficiently

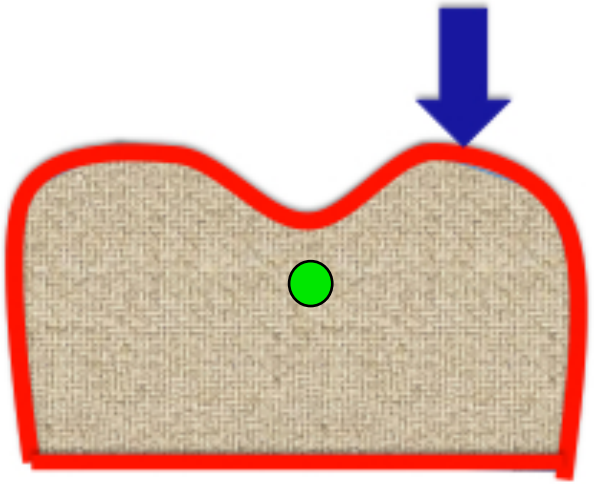


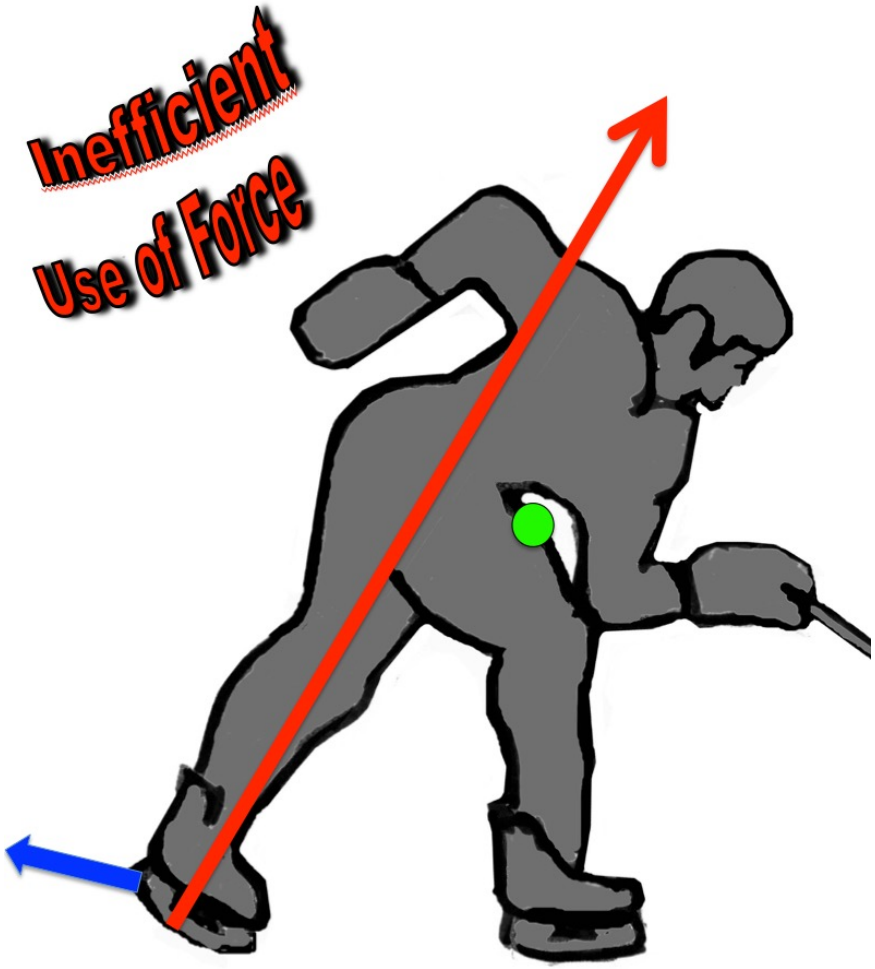
No one posed for photos in this book.
All photos were taken during workouts.

The dreaded 'Pike' position

When skaters fail to get to SLX at the end of each stride, the driving force line does not pass through the Center of Mass, which is shifted forward out of the body when they're bent at the waist. To compensate, they usually 'paw' at the ice as with toe picks, kicking their skate backward in an ineffective attempt to accelerate forward.

The pike position in skating is as inefficient as pushing a net down the ice, but not pushing in the middle, through the center of mass.



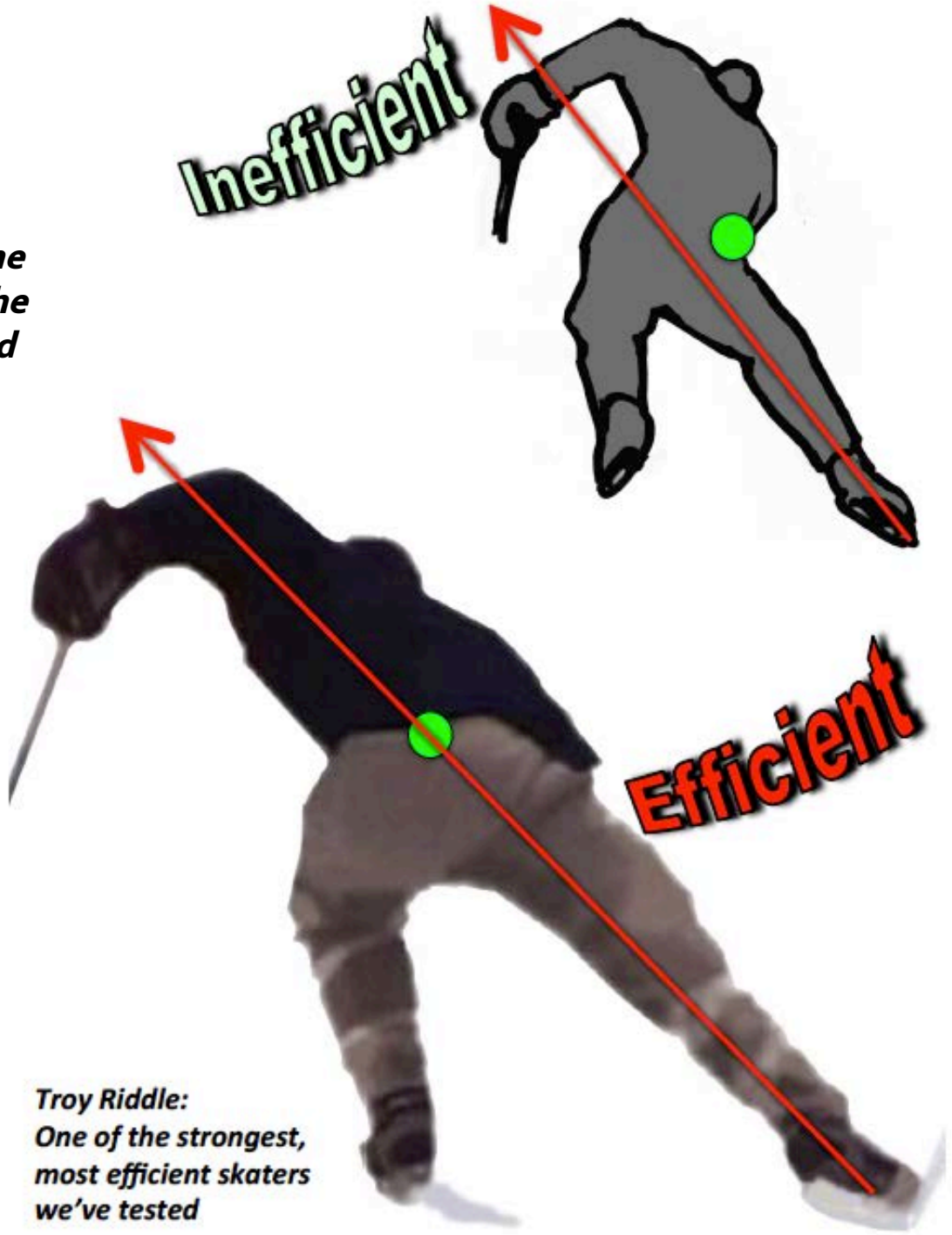


This inefficient stride can be learned while watching figure skaters, because toe picks make it possible to propel yourself by pushing straight backward w/o turning the blade perpendicular.

Same concept …

Straight Line Xtension, but from a different perspective.

Bending sideways through the core is wasting strength in the same way as bending forward into pike position.



Thoughts for 'teaching' efficient Force-Application,

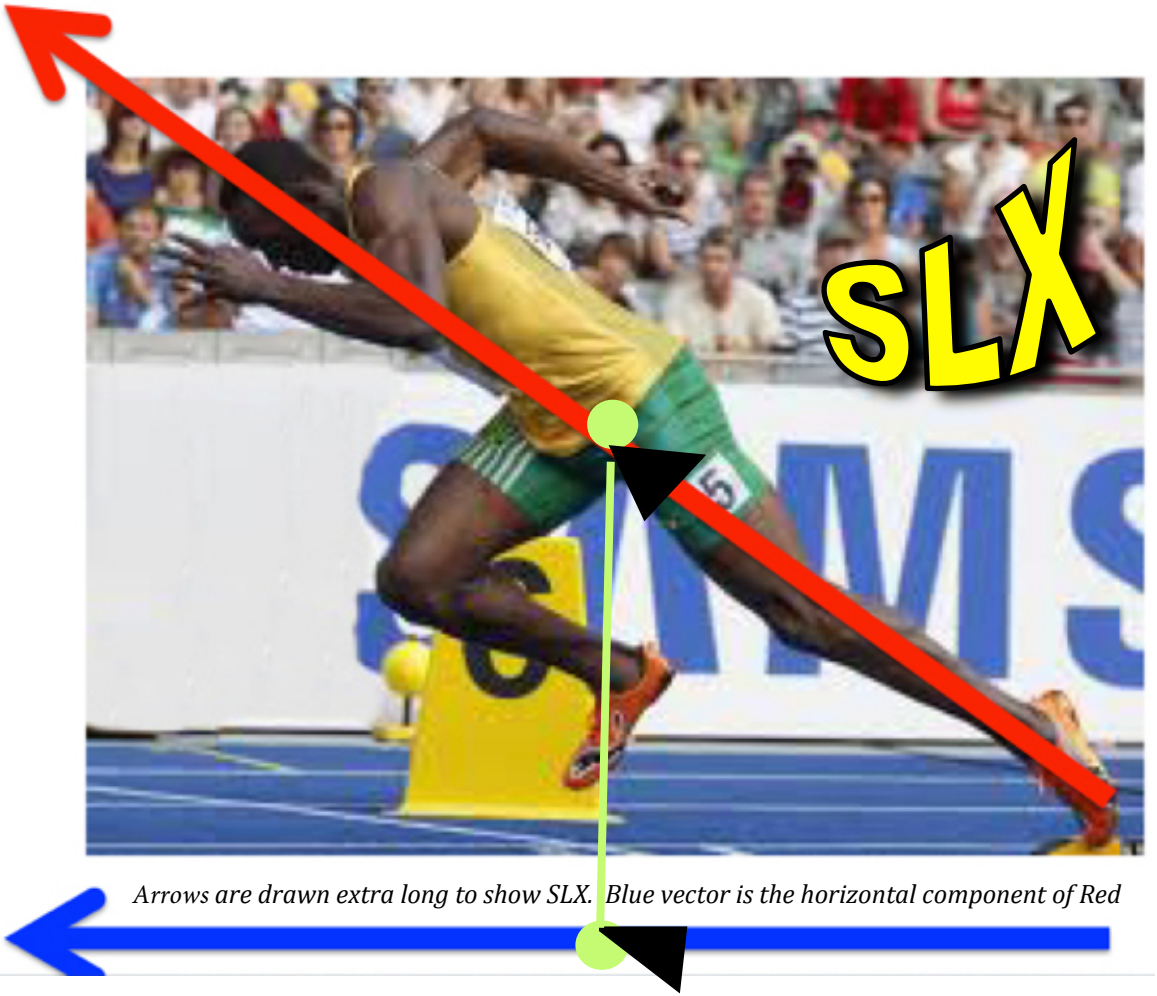
where the Force passes through your center of mass

- *Place photos everywhere (like this one). Kids will mimic.*
- *Don't lecture. Let them learn by feel.*
- *Promote arm swing to drive legs.*
- *Sternum actually moves left/right.*
- *Greater abduction force is a must.*
- *Strengthen posterior erectors.*
- *Quality not quantity reps.*
- *Near-recovery is essential.*
- *Nerves are learning fast.*
- *You become what you repeat.*



Copy Usain Bolt

He worked on applying strength efficiently every day.
It's just as important as getting stronger.



Arrows are drawn extra long to show SLX. Blue vector is the horizontal component of Red

The object of strength training is to increase total force (red vector).

But the object of efficiency-training is to increase the horizontal component of force (blue vector).

Lean + SLX

Movement itself, is the best teacher

Efficiency

1) Lean before takeoff effort.
2) Efficient force = SLX
   Force passes thru
   the center of mass.
3) Result: longer jump
   by 25cm.

SAME EFFORT IN BOTH JUMPS.
Study the difference in efficient
force application.



After learning the feeling of SLX from one-legged jumps.

Before one week training with one leg. No instruction.



Inefficiency

First trial with no training

1) Late lean – after takeoff.
2) Inefficient force. No SLX.
3) Result: Shorter jump.

Both 100% effort, but in a week, one-legged training 'taught' his CNS the feeling of efficiency.

Kinesthetic Feelings are learned by Copying and Doing!

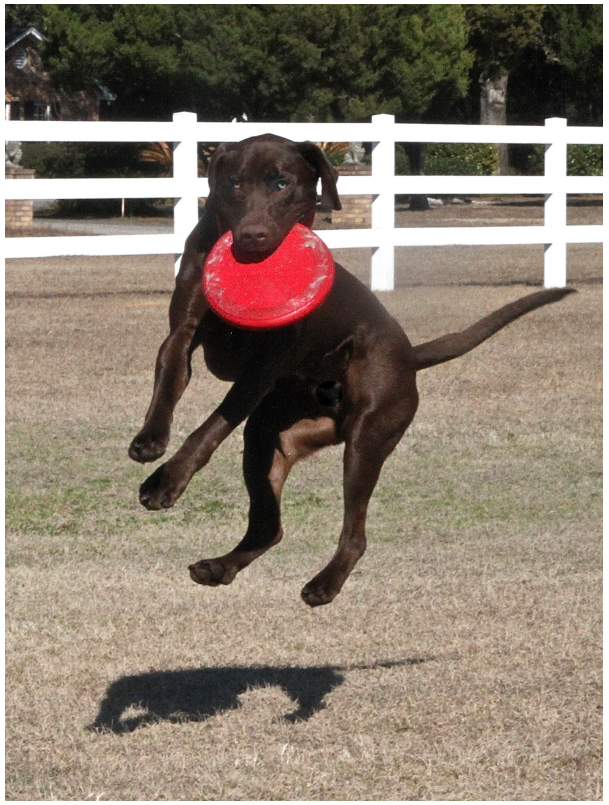
Read about the brain's 'Mirror Neurons' in Google. They're important in learning.



Movement, for thousands of years has been learned by copying and trial-and-error. That's what children do best. We coaches would like to think our lectures have a big impact, but our job is to create environments for learning, using photos, video, and mimicking of good athletes, but most of all ... ACTION.

Keep it simple. Say little, and let athleticism happen.

Imagine trying to explain the details of sprinting, jumping, and catching a frisbee.



Create the environment, and turn them loose!

Straight Line Extension (SLX)

The Russian Box is an excellent bridge to transfer strength and efficiency from the weight room to the hockey rink.

Without lecturing about efficiency, just instruct athletes to elevate their head as high as possible.

That will automatically straighten the body into SLX position.







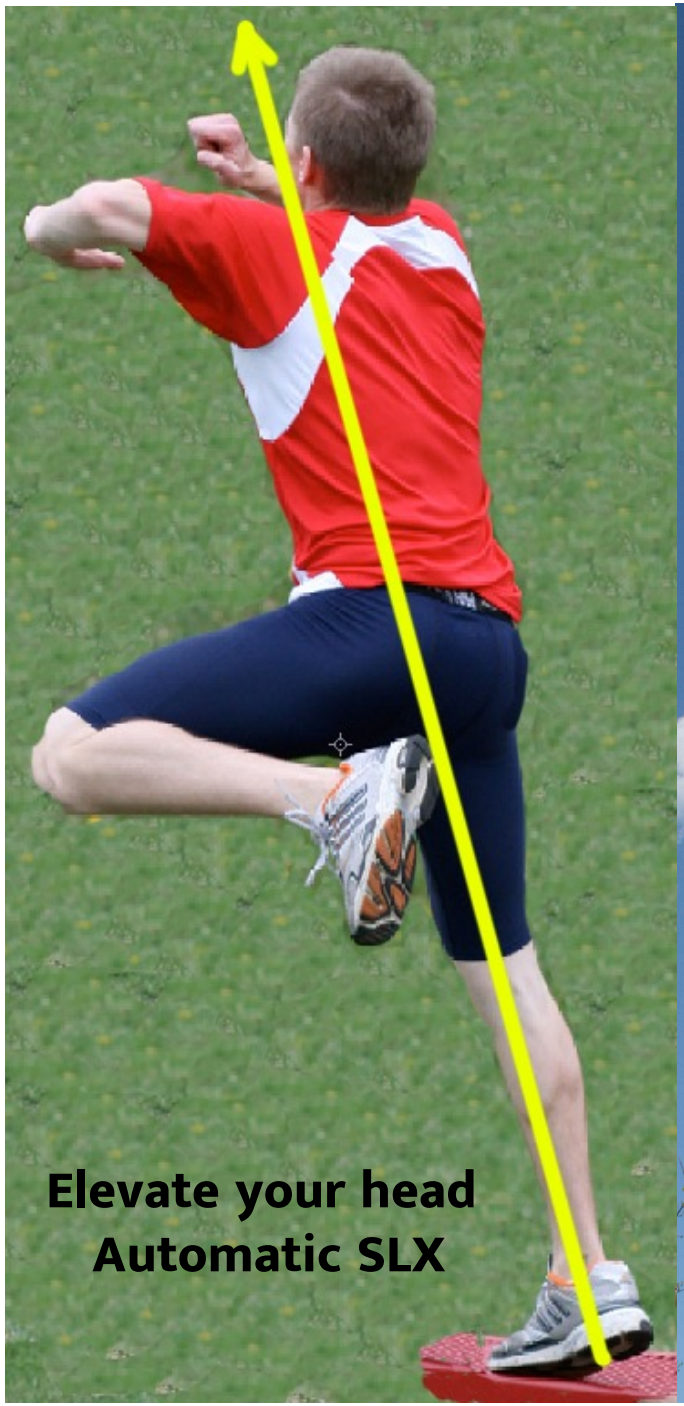
Learn efficiency by FEEL

Step-Up Jumps 'teach' efficient use of Strength

This must be learned in the gym, along with strength.

Repeat many times:

"Elevate your head"


Elevate your head
Automatic SLX

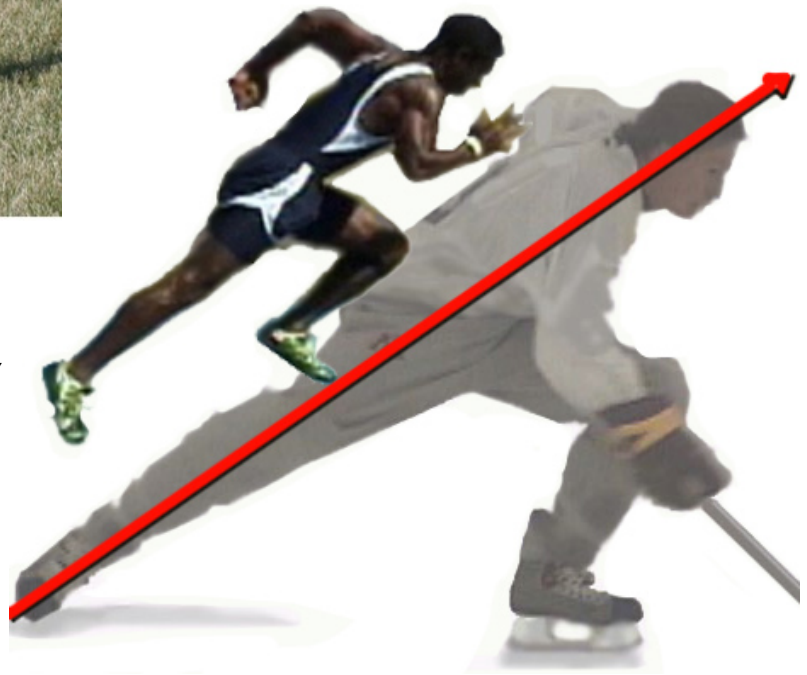

Step-Up Jumps are very
intense and must be limited
to 4-5 sets each week
(with only 3-4 reps each leg)
and only after several weeks
of strength training and jumping



Uphill Acceleration

10-15m uphill sprints are the best dryland preparation for on-ice acceleration – repeating both efficient and explosive power.

Straight Line eXtension (SLX) is efficient body position for acceleration. Olympian Gigi Marvin produces the most speed for her force production.



Note: sprinting uphill, athletes use more abduction than they would on a track. Therefore, arms will cross the body almost as much as in skating.

Note2: Even on a flat track, world-class sprinters abduct slightly in the first couple strides. Apparently there is a leverage advantage in the muscle-bone architecture.



Troy Riddle, one of the fastest skaters we've timed in 40 years, sprints uphill, showing SLX efficiency from high school track.

This same neuromuscular habit contributes to his skating quickness as well. Compare with photos in this book.

Below are several college and professional players, all of whom achieve SLX with each uphill stride, but not the instant this photo was taken.

One NHL'er was photographed at the right moment to show SLX. Quickness has been a major asset throughout his college and NHL career.



Efficiency or Straight-Line-Xtension is a must on hills, not just great force.

Use short intervals of about 10-15m with 40-60s rest. This ensures quality sprints that improve quickness



Short 10-15m sprints pulling a sled can teach efficient posture



Forward Lean & SLX when the harness is attached to the shoulders.

If attached at the waist, it can encourage bent-over Pike posture.

So, the design and application of the harness determines the value of these sprint workouts.

Move Your Body

Is Strength Training an important part of this process?

Absolutely! But Skating Speed, Strength, Quickness, Agility require strength training that goes beyond the current model, and at the same time, does not rule out the best traditional lifts.

For Lower Body & Core Strength to improve Skating:

Strength (force) must be APPLIED EFFICIENTLY.

Strength must be EXPLOSIVE from one leg.

Strength in core muscles must be SYNERGISTIC with muscles that move the limbs.

Strength must accelerate your BODY, not always a barbell.

Strength must include hip ABDUCTION-ROTATION-EXTENSION for skating explosiveness.

Strength must transfer ...

- ***to AGILITY: random changes of direction;***
- ***to REACTIVITY: for the chaos of obstacles in competition;***
- ***to every possible RANGE of MOTION in hip joints, not just one plane as with barbells;***
- ***to every SPEED including rapid acceleration-deceleration.***

Strength-Endurance must MAINTAIN ALL THE ABOVE for an entire game.

Train like a Cheetah