Strength Training for Sport

Getting weight-room strong is easy & very measurable. Applying that strength to sport is difficult & somewhat esoteric. That is why we need to take another look at a whole approach to strength training. Vern Gambetta – The GAIN network

This is a fascinating statement from Vern where he, again, raises the pertinent question about the role of strength training in sport. Finding an answer is the difficult part especially if you believe in the mantra that 'there is never only one way of doing anything'.

Too often athletes enter into a strength training program that sees them getting generally strong by a variety of methods and then, at a later date – closer to competition, attempting to use this newfound strength in the actions and postures required by the sport. Let's be frank – if you get generally stronger, fitter and more stable you will probably improve your sports performance. Even if all you do is the sports-specific stuff I am sure that some improvement in sports performance will show its face at some stage.

However, if your goal is the set a progressive, long term, ever-improving performance continuum that, hopefully, culminates in a major world championship or collectively in a full season of exemplary performance then the 'general' stuff on its own probably won't be appropriate or sufficient.

Many athletes choose a theme of Olympic / Body-Building weightlifting type exercises as their main strength training tool. Often we see a progression of work cycles from strength accumulation to strength maximisation and onto strength application. These cycles of work can be many weeks in duration which allow the body time to adapt to the load in question. These progressions are often sequenced in a linear manner where some periods are spent accumulating strength e.g. 3x5 > 4x5 > 5x5 > 6x5 at approximately 80% of 1RM. Weeks are then spent maximising the load e.g. 3x3 > 4x3 > 3x2 > 4x2 > 2211 at loads exceeding 90% of 1RM; athletes then attempt to weave this strength attainment into the sports-specific actions and postures as the competition phase approaches.

Often the exercises include Bench Press, Shoulder Presses, Machine Rowing; Squats; Cleans, Deadlifts, Snatches, Leg Presses, etc, and they can appear to be a successful format i.e. athletes get 'weight-room' strong. Often these programs have other elements integrated such as Circuit Training, Plank work for stability and some type of 'Pre-hab' often generated by a physiotherapist under the heading of 'injury-prevention'. All in all, things look OK – athletes can get stronger in the exercises and they may even see injuries reduce a little.

The key question is that while an athlete 'gets stronger in the exercises' what is really happening with the sports-specific actions and postures that the final test is all about – the contest itself? This is the crux of the matter – how much of this all-round strength can the athlete apply across all the competition circumstances they will face? How strong is strong enough?

Before looking at these questions it is pertinent to put things into perspective with regard to the journey the athlete is on.

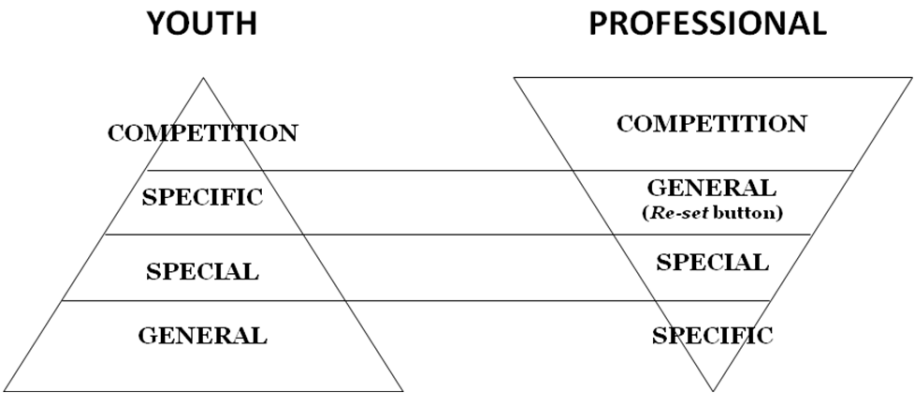
This brings to the fore the issue of the training age of the athlete. I would suggest that the lower the training age the more 'general' things will be. The higher the training age the more specific one can be. This 'training age' implication must be examined closely before decisions are made in haste. Training age is not simply the number of years an athlete has been turning up at training. I describe training age as the number of years of appropriate technical, tactical, physical and mental adaptation to appropriate prescriptions. In other words, the athlete must have a background of 'earning the right' to progress by accumulating effective and permanent adaptation to the many-sided aspects of appropriate training and competition.

In the early stages of the journey the exercise prescription should see an exposure to: Movements (every plane, direction, amplitude, speed and complexity); the full range of force experiences (general anatomical adaptation, general strength, maximal strength, power, RFD); a full range of

metabolic challenges (alactic, lactic, aerobic); a full range of learning opportunities (implicit and explicit); a full range of contest adaptation (personal tests, indirect competition, direct competition).

As the training years unfold so the prescription of training and competition begins to become more focused on contest outcomes. In the early teenage years the athlete will also need to adapt to the 'arena-skills' and 'life-skills' associated with performance. Their ability to live the life of a performing athlete both outside the arena and within it must be experienced and progressed in the same way that the 'hard' skills of technical and physical training have been developed.

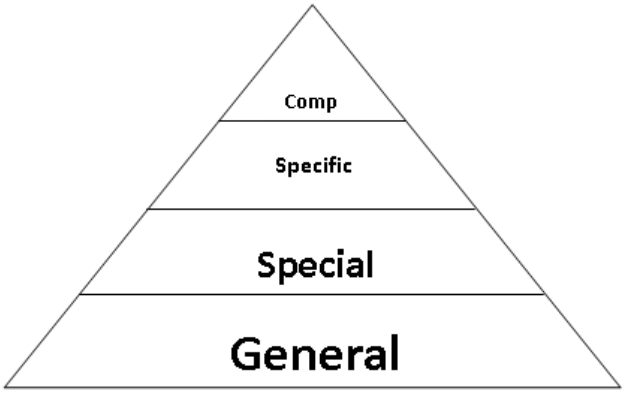
My colleague Steve Myrland illustrates the difference between the journey of the developing athlete and that of the seasoned athlete as follows:



Don't worry about training like the pro's....until you are one. Steve Myrland, 2009

This journey can be illustrated as follows:

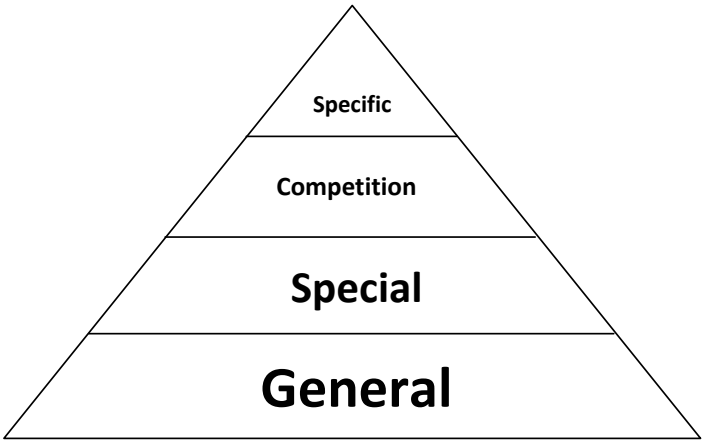
Youth / Development Model; Age 5 to 16 years



Learning to move; moving to learn Steve Myrland 2009

Here the developing athlete spends a large amount of time in 'general' work and decreasing amounts of time in 'special', 'specific' and 'competition'.

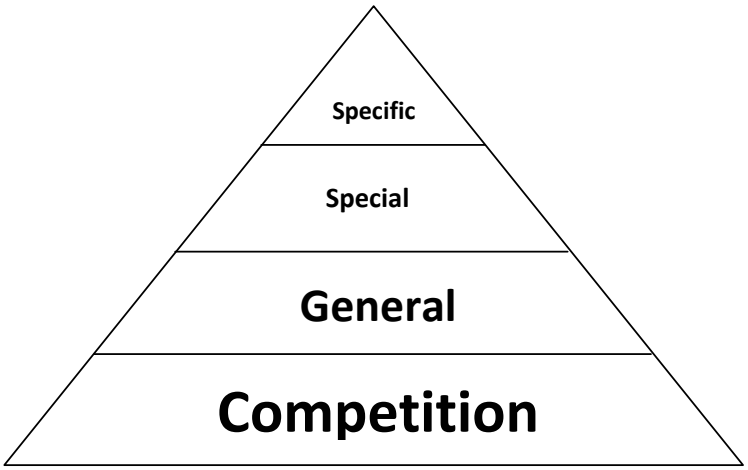
Continuing Model – Age 17 to 21 years



Training to train (better, harder, longer); learning to compete. Steve Myrland

Here the athlete uses general work as the cornerstone of their program. They also use competition and specific work as part of the plan to hone their competitive cutting edge when it really matters – at senior level.

Professional Model Ages - 22+



Training to survive, thrive and win. Steve Myrland

Finally, the athlete arrives at the part of their career when the outcome of the contest is the sole measurement. They use the 'general' periods as a time to renew and review the foundations of their training.

If the journey is assembled as mentioned, whereby the athlete has an all-round grounding in a wide and deep set of physical experiences, then the program can start to shift towards the required outcomes of performance enhancement. Strength training prescription, for example, may well begin to resemble movements that are closer to those experienced in the contest and the use of 'complex' training might be considered.

The previously mentioned linear progression of repetitions and sets is not appropriate to the athlete not involved in Olympic Weightlifting or Powerlifting sports. There is far too long a gap between the strength stimulus (accumulation, maximisation) and the actual sports-specific actions, postures, force requirements, etc. As the journey narrows to performance enhancement and a rigorous competition

cycle so the training should not venture too far from the sports-specific movement, actions, postures and force requirements. The role of 'complex' training can be effective at this time by linking the general movements, and all the forces experienced, to the sports-specific movements.

Complex training in this instance is where the session exposes the athlete to a variety of stimuli from the force continuum and at the same time exposes them to movements that span from general to specific.

Example from a Triple Jumper I coached

A senior athlete with a training age of 10 years. This example shows the period of about 8 weeks out from the start of the competition season.

Session 1

Exercise	Set 1	Set 2	Set 3	Set 4
Double Leg Squat	X6 @ 80% 1RM	X5 @ 85% 1RM	X4 @ 85-87% 1RM	X4 @ 85-87% 1RM
Barbell Jump Split Squat	3 each Leg @40% 1RM	3 each Leg @30% 1RM	3 Each Leg @ 25% 1RM	3 Each Leg @ 25% 1RM
Single Leg Hurdle Hops (Timed)	4 each Leg @ 100cm	4 each Leg @ 100cm	4 each Leg @ 100cm	4 each Leg @ 100cm

Session 2

Exercise	Set 1	Set 2	Set 3	Set 4
Double Leg DB Snatch to Squat	X4 each Leg @ 80% 1RM	X5 @ 85% 1RM	X4 @ 85-87% 1RM	X4 @ 85-87% 1RM
Single Leg Clean	3 each Leg @40% 1RM	3 each Leg @30% 1RM	3 Each Leg @ 25% 1RM	3 Each Leg @ 25% 1RM
Single Leg Hurdle Hops (Timed)	4 each Leg @ 100cm	4 each Leg @ 100cm	4 each Leg @ 100cm	4 each Leg @ 100cm

Session 3

Exercise	Set 1	Set 2	Set 3
Barbell Jump Split Squat	3 each Leg @40% 1RM	3 each Leg @30% 1RM	3 Each Leg @ 25% 1RM
Single Leg Hurdle Hops	4 each Leg @ 100cm	4 each Leg @ 100cm	4 each Leg @ 100cm
Bounding	2H2St2H2St	6St	HSJ x 2

The Rationale

3 sessions per week under the 'Strength' banner.

Session 1 & 2 sees each set move from strength accumulation (Exercise 1 – heavy load) to a more 'elastic' / power exercise (Exercise 2 – an ever decreasing 'fast-strength component) to a bodyweight

exercise with high RFD expectations (Exercise 3). About 2 minutes rest between exercises and 5-6min between sets.

Hopefully, this allowed the athlete to explore a variety of force levels within the same set and to finish with a movement (Single Leg Hurdle Hops) that was close to the movement / force pattern of the event.

With fatigue setting in as the week progressed the final session saw a reduction in volume (2 to 3 sets) and a major increase in rest between exercises and sets. The heavy load exercise was eliminated and the last exercise moved even closer to the movements and forces of the event – e.g.
Set 1 - 2Hops into 2 steps into 2 Hops into 2 steps against the tape measure (8 landings)
Set 2 – 6 steps against the tape measure (6 landings).

I am hoping that this example gives just one idea of how to apply strength from the weight-room to the sport. Without knowing what scientific research says about all this I tried to get the body and brain to transfer gains created in the 'general' exercise – Double Leg Squat and Double Leg DB Snatch to Squat – all the way to the exercise that was closest to mimicking the actual event – Hurdle Hops and Bounding, all within a short period of time in the session. Each of the chosen components had its own horizontal journey (increasing load, intensity, etc) over time while at the same time being linked vertically with the next exercise.

It was designed by me AND the athlete based upon previous history, current status, what had gone before, and what was yet to come. It certainly is open to much criticism from strength coaches better than I and is not being presented as something for anyone to follow with their athlete. It is an attempt to show that there are many roads to Rome when trying to get the strength gains to work with the sport.

March 2014
Kelvin B Giles MA, CertEd, AS
kbgiles@gmail.com