Chris Dorman, Blake McLean,

How would you describe the scope of practice for a Strength & Conditioning (S & C) Coach?

In terms of the scope of practice for an S & C Coach, I am of the opinion that S & C Coaches are and should be the epitome of the expert generalist. We are physical preparation and performance people; therefore, we must know about a vast array of topics (please see table below for a minimum recommendation to skills that are needed in professional sport). Underpinning all of this are the fundamental understandings of human anatomy, physiology. biomechanics, motor control, psychology, nutrition, metabolism, molecular biology and biochemistry, all which are fast evolving and will be ever changing as science technology progresses. Our scope of practice is large, varied and therefore complicated and needs to be agile.

Running	**Strength**	**Tactical**	**Technology**
Acceleration	Strength i.e. Powerlifting methods	Small Sided Games	Global Positioning System
Max Velocity	Power i.e. Olympic Weightlifting methods	Game Speed Conditioning	Heart Rate
Deceleration	Coordination i.e. strength training coordination methods	Tactical Periodization	Accelerometers
Change of Direction	Sports specific strength training		Force Plates
Conditioning	Plyometrics/jump training		Velocity Based Training systems
Reactive and unplanned components.	Rehabilitation style strength training		Various software's. Excel whiz!

I am also of the belief that because of this broad array of fields that S &C Coaches must be competent in, is, the flip side of scope of practice, is negligence. Due to departmental hierarchies

and structures, role descriptions, accountability and potential job termination and litigation (and not mention egos and agendas), we may become myopic about scope of practice. However, sending under prepared athletes out to battle because we have failed to address something in their preparation, maybe considered negligence.

What is your experience integrating with medical – how do you determine who is leading the specific exercise prescription?

My experiences with integrating medical and S & C, have been varied, progressing through different ‘’eras for lack of a better term:

- ‘Phased rehab’ where physios may take the early part of rehabilitation and then handover the S & C Coach.

-Rehabilitation coordination, where a person/s in the department is made responsible and accountable to the complete rehabilitation process.

-Group specific rehabilitation, where a playing squad may be split up into groups and aligned with specific S & C Coaches and when a player becomes injured, their immediate S & C Coach is responsible for that players rehabilitation.

However, I have settled on an what I think needs to ‘be the most agile approach’ to the integration of medical and S & C coaching under the performance umbrella. I like to have or be involved in an agile relationship, systems and processes between an S & C Coach and Physiotherapist both standing side by side coaching the athlete, making observations, discussing, and making progressions live. However, this requires complimentary personalities, motivations etc., to say the least. I do not believe anyone professional should be leading the exercise prescription as both professionals see risk through different lenses and these calculated risks need to be agreed upon before progression. If such as scenario is not present, the entire rehabilitation is based off one persons biased opinion (must be aware of your own and other biases that influence their decision making).

In my mind, this relationship best serves the player and club all the way through the rehabilitation continuum, from early injury management (where S & C Coaches need to be across this information), right through the reconditioning phases and return to performance.

What are the best integrated approaches to athlete preparation that you have seen? Does this differ in healthy and RTP athletes?

The best integrated approaches to athlete preparation that I envisage are wholistic in nature. Clichés get used a lot in our industry and may include things like; do the basics well, get the fundamentals right, and keep it simple. These are all true in my mind, but they can narrow the focus whereas physical preparation (as mentioned above) is so broad, that one needs to accompany all of them. You can be the best strength coach, speed coach, fitness or rehabilitation coach for example, but if you have not developed the athletes underlying health via understanding molecular biology, biochemistry, nutrition and lifestyle factors (which may largely be driven by club or sport culture) then you will never develop athletes/teams to full potential.

I think injury and illness rates in the context of game specific training loads are true markers of the physical preparation program and not strength training, speed, or fitness numbers. Condition to the demands of the game is a principle of strength and conditioning and when we get this wrong, via under or over preparing, this is reflected by injury and illness numbers.

Integrated approaches to athletic preparation exist on a continuum and should be principle driven, rather than randomly selecting different training means, methods and strategies. Therefore, in my mind there is no difference to healthy vs rehab players preparation, stick to principles, just adjust the means and methods in a systematic way. Additionally, condition to the demands of the game using a principle centered approach in conjunction with an open and growth mindset. Science is in its infancy, clearly, we do not everything otherwise we would not still be getting injured as frequently.

Can you discuss your philosophies around, training fundamentals, training for physiological adaptations vs very specialized 'sport specific' prescription?

I believe training fundamentals should be based around the hierarchy of human movement in terms of the neurodevelopment sequence; mobility, stability/motor control and strength in the context of the timeline given to prepare athletes for the competitive season i.e. in my case, 5-6 weeks of pre-Christmas training, and approx. 6 weeks post-Christmas training. Basic Periodization methodology dictates the early part of a preparation period to be General Physical Preparation (GPP) and the later part to be Specific Physical Preparation (SPP). So in the GPP phase I like to gain (and regain in most circumstances) as much mobility in and around all joints, whether it is specific the game or not, with the purpose of creating a buffer zone so to speak between movements required in the games and full range of motion of all joints resulting in injury resiliency and prevention. Also, in the GPP Periodization, I agree with the methodology that there needs to

be much muscular work performed through large ranges of motion and multiples planes of movement and joint angles in the heavy, strength repetition range. Aerobic function also needs to be improved in this phase, which I currently believe is not done well in many team sport settings. Aerobic Deficiency Syndrome (ADS) is ever present in professional team sport athletes.

We definitely need SPP, but what I have observed in recent times is too much specificity too early and at the expense of general preparation work, evident by the lack of many athletes ability to move fluently through full and to end ranges of motion and ADS. Combined with the reduced physical competency we see these days (poor mobility due to prolonged sitting, lack of early childhood physicality), too much specificity too early has resulted in reduced tissue tolerance to work, vulnerability, fragileness and poor injury resiliency.

When an athlete/team is ready for SPP, sports science has allowed us to get extremely specific with preparation strategies. For example, GPS acceleration vs deceleration metrics to quantify conditioning effects of tactical drills. In terms of strength preparation, I like to 'surf the force velocity curve as the say, via exercise selection, using inherently faster and more complicated movement progressions, not using a GPP exercise to try and develop power. For example, this would involve Trap Bar Squat Jumps instead of a Back Squat in order to develop/express force and power through the movements full Range Of Motion (ROM), as in a Back Squat the bar starts decelerating well before the movements range of motion is complete (approx. 60% of the movements ROM), therefore limiting the athletes potential to develop joint, position specific force/power. Accommodating resistance may give you slightly more force/power through ROM but deceleration is still evident. Therefore Ballistic/release/jump style movements are the what I tend to use in SPP. Eccentric forces are often forgotten about as we get caught up in concentric power competitions that we create for athletes, and are invaluable to athletic preparation for soft tissue injury prevention and deceleration based injuries, therefore much of my program is dedicated to this type of training in this phase. After coming across Flywheel technology such as the kBox,and using it extensively at 2 different professional sporting club and in the community for rehab purposes, I believe this to be superior technology in strength preparation.

How do these philosophies influence your thought process when programming? Are you thinking about specific physiological adaptation or performance outcomes when you are putting together a program?

The philosophies mentioned above are principle centered and govern my planning and decision making when programming. Physical preparation is a process, systematic and

methodically progressed over time, in order to get the individual available (resistance to injury) and to be able to do their job over the course of a 6-month competitive season. You must have an overview of your physical preparation plan (Periodization), but athletes lifting skills, strength, fitness all evolve at different rates and injury, illness and external life stressors interrupt this process. We must start at the demands of the game (usually with a Needs Analysis), reverse engineer and work backwards in planning to work out what we want our athletes to be able to do. On entry, we start with assessments, tests, and analysis to determine where each individual is at physically, then, design and train progressions, regressions, and alternative solutions in getting them to the point at which we want them. This is essentially the principle if Individualization and leads to tailored training programs.

You have worked with a lot of team sports where hamstring strains can be an issue. What do you think about in a wholistic approach to hamstring injury prevention/reduction strategies?

Working back from the understanding the injury mechanism (this is indicative of what needs to be targeted in hamstring retraining), I am thinking about retraining the athletes running mechanics, from the initiation of early injury management (low speed patterning drills) as this can deload the hamstrings if existing mechanics are incorrect and lead to a more efficient running gait. I am then thinking about my strength training progressions to facilitate the action of the hamstring in the running cycle and the general preparation exercises that may precede these end stage exercises. Additionally, I am thinking about nutritional strategies to compliment healing, ensuring that there is enough manual therapy and recovery interventions to promote healing, skill maintenance and general aerobic/fitness conditioning with body composition in mind.

During physical preparation, how do you think performance and medical professionals should apply psychological principles, while maintaining appropriate scope of practice?

I think the psychological realm is the evolution for human performance and is starting to influence our industry in terms of day to day training rather than event strategies such as visualization and dissociation techniques, which are the realm of the Psychologist. Much of what has been done in recent times in relation to muscle and movement training is largely reductionistic (as a function of science, i.e. the need to reduce, control and study things in isolation) and I think the influence of Franz Bosch and Dynamic Systems Theory is having a huge and game changing influence on performance training. Maybe not considered psychological principles, but integrating

the brain and reflexes, this method of training has applications is rehabilitation and performance training, strength, and running/mechanics.

We see the need for and the influence of psychological principles every day in professional sport. Fatigue is largely perceptional. Players can train for 2 hours on the field in hot and human conditions, have 1-hour break/lunch, come into the gym, and say, I have got nothing Coach, I am buggered (typically it wouldn't be worded like that!). But through a little persuasion and perhaps appropriate design or acute modification of the session, the same players can hit personal bests in a/some lifts. So as coaches we must be aware of such principles, have tact but acutely decide on such a strategy to see if the player is telling the truth (and determine if there is true fatigue/central nervous system fatigue) and push other areas, so as to constantly progress the athlete.