

A person is kayaking on a calm lake at sunset. The sun is low on the horizon, creating a bright orange and yellow glow that reflects on the water. The sky transitions from a deep orange near the horizon to a pale blue at the top. The water is still, with gentle ripples around the kayaker. The overall mood is peaceful and serene.

Purpose, Protocol, & Proper Programming: A Coach's Guide to Canoe Kayak Canada's On-Water & Off-Water Testing

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Overview of CKC Testing

- Importance of On-Water Testing
 - Purpose
 - Athlete Objective
 - Brief Description
 - What to record
 - Equipment Required
 - Course Requirements
 - Programming as a club coach
 - Relevance of results

- Importance of Off-Water Testing
 - Purpose
 - Athlete Objective
 - Brief Description
 - What to record
 - Equipment Required
 - Programming as a club coach, when is best in YTP? How often?
 - Relevance of results



The What, Why, When, and How of Canoe Kayak Canada's

ON-WATER TESTING

Why is On-Water Testing Important?

- Sport specific, a combination of technical, neuromuscular and energy system contributions to performance
- Assess the progress of previous training cycles and help individualize the following training cycles
- Provides insight into which factors are important in producing great performances
- Furthermore standards can be set by age group or discipline or development stage.

Canoe Kayak On-Water Testing

1. 4 x 1000m incremental step test.
2. A General aerobic check (GA1 check)
3. 4 x 250m speed endurance test.



1. Aerobic Capacity and Power:

4 x 1000m Incremental Step Test

PURPOSE:

- To provide individual training intensities and to help stratify the training group
- To determine the relationship between paddling speed and physiological responses (Heart rate, Blood lactate)
- To track physiological and technical change throughout a range of intensities.

ATHLETE OBJECTIVE:

- to paddle well at each step, evenly pacing the first three and giving a full all-out effort on the fourth step

BRIEF DESCRIPTION:

- Four steps each one self-paced all done in the same direction. The idea is to get a nice progression of intensities from GA1 low through to an all-out 1000m. The repeat time is 20 minutes and involves paddling back up to the start, 2 minutes between each athlete. If there is wind it is recommended to be done in a tail wind rather than a headwind.

1 - 1000m is GA1 low, 9-10 RPE

2 - 1000m GA1 high, 12-13 RPE

3 - 1000m E1 high, 15-16 RPE

4 - 1000m all-out effort, one that provide a good sold race pace effort. RPE 18-20
blood lactate: 13-16mmol/L maximum aerobic power

4 x 1000m Incremental Step Test: cont'd

WHAT TO RECORD: Time, stroke rate, heart rate, & capillary blood sample from the ear lobe.

EQUIPMENT REQUIRED:

- Stopwatch with stroke rate (SPIN-MMS for further analysis), Capillary blood sampling kit, RPE 6-20 scale, heart rate monitor.
- A coach will start athletes, record wind conditions and take notes.
- A coach at the finish will record times and stroke rates.
- Note: It is recommended that two physiologists are present and take the blood samples. The physiologists will also record the RPE and heart rates

COURSE REQUIREMENTS:

- Fixed course on flat water. A competition or surveyed course is best.
- Aerobic capacity all the way to max aerobic power (race pace) – looking for the range in there. Encompasses a range of abilities associated with everything aerobic capacity up to maximum aerobic power.

4 x 1000m: Programming & Relevance

Take Aways for Club Coaches

PROGRAMMING: When is it best to write this workout into your program?

- Step test is a test because it is done before or after a meso cycle in the Fall and/or Spring.

RELEVANCE: What do the results tell you as a coach?

- Physiological improvements: are you able to paddle faster with the same metabolic load. Have those velocities gone up? You should be able to paddle at the same metabolic load faster.
- Technical: is the athlete paddling better, faster, more efficiently? if there are SPIN units on you can look at others, but with SR we look at if the athlete is paddling faster with a lower SR – whether their stroke is more efficient.

NOTE: modification of this test can be done if coaches do not have Physiologists and certain resources available.

A General Aerobic Check – GA1 Check

PURPOSE:

- to assess speed and effectiveness of paddling at a low metabolic load and provide in practice feedback on appropriate intensity.

ATHLETE OBJECTIVE: to paddle well at a low metabolic load.

EQUIPMENT REQUIRED: Stopwatch with stroke rate (SPIN-MMS for further analysis), Capillary blood sampling kit, RPE 6-20 scale, heart rate monitor.

BRIEF DESCRIPTION:

- Multiple reps at GA1 5-10' in duration
- 2 x 8-12min at the GA1 low (Blood lactate of 2.0 mmol/L), and 2 x 8-12 min at GA1 high (Blood lactate of 3.0 mmol/L) is recommended

Ex. 4 x 2km (out and back) is common. 2 x 2km at 2mmol/L, 2 x 2km at 3 mmol/L

Note: GA1 low may be around 8-11 on the 6-20 RPE scale, and GA1 high 10-13.

WHAT TO RECORD:

- Time for known measured distance, stroke rate, RPE and heart rate, and a capillary blood sample from the ear lobe.
- Wind speed, direction, water temperature

GA1 Check: Programming & Relevance

Take Aways for Club Coaches

PROGRAMMING: When is it best to write this workout into your program?

- Spring, summer, and/or fall. Athletes are training the majority of their on-water sessions in a GA1 zone

FEEDBACK: speed, stroke rate, heart rate and RPE at GA1 low and GA1 high (blood lactate concentrations of 2.0 and 3.0 mmol/L)

- After each rep the physiologist and coach quickly work together to provide the most meaningful feedback
- The objective is to paddle effectively at each intensity, if the blood lactate level is higher than the target then the athlete must slow down by either reducing stroke rate or power per stroke (distance per stroke). If the value is lower the athlete must speed up by either increasing rate or power per stroke (distance per stroke).

RELEVANCE: What do the results tell you as a coach?

- Whether the athlete adjusts rate or distance per stroke is decided by the coach based on the goals they have for that athlete. Keeping in mind the subtle differences in abilities each athlete will bring.
- If athletes are spending 80% of the time in this intensity, we see the velocity go up. Specific aerobic capacity component. sub anaerobic threshold, we should not be accumulating any lactate. Stroke rate, heart rate, RPE, at the designated intensity. If your speed is improving, this check is an opportunity to determine that an athlete is getting more fit specifically in that energy system. *We can't separate whether it's a physiological or technical improvement. We hope that it is a bit of both.
- We still measure an ability even if it's not the primary ability you are trying to improve.
- Straight-forward test provides coaches and athletes with general overview of athletes aerobic abilities.

NOTE: modification of this test can be done if coaches do not have Physiologists and certain resources available.

3. Speed endurance 4 x 250m

PURPOSE: To assess speed, speed endurance & clearance rate of lactate

ATHLETE OBJECTIVE: To go as fast with controlled SR paddling well.

EQUIPMENT REQUIRED:

- Stopwatch with stroke rate, optional SPIN-MMS (multi-measurement system) unit can be used for further indepth analysis, Capillary blood sampling kit.

BRIEF DESCRIPTION:

- The test set is 4 x 250m all out efforts on a repeat time of 4 minutes. Each effort is done in the same direction, ideally in a tail wind. Athletes commonly go in pairs.
- Warm up: Athletes should warm up appropriately ready to sprint

WHAT TO RECORD:

- Time and stroke rate for each effort.
- The lactate samples are taken (from the ear lobe), as close to 3min, 8min and 15min following the last effort. This way we get an idea of peak values of lactate and clearance rates/ how well they are recovering. During the recovery the athletes are encouraged to paddle lightly, it should be an active recovery.

4 x 250m: Programming & Relevance

Take Aways for Club Coaches

FEEDBACK:

- Fastest 250m (should be the first if warmed up properly), drop off from fastest slowest effort.
- Peak lactate and clearance rate.
- If a SPIN-MMS unit was used then distance per stroke and stroke effectiveness can be reviewed

PROGRAMMING:

When is it best to write this workout into your program?

- Spring and summer. Can be very useful as a lactate workout, can be done right before a major competition/specific comp phase (10 days prior) – you may see some very high lactate values for that athlete – 1-2mmol/L higher than they did weeks/months prior. Anytime you start to work on speed and lactate endurance, this test fits in it. Highly dependent on a high level of motivation to go fast. Useful to complete the entire test. Do not often schedule this test during fall season.

RELEVANCE:

What do the results tell you as a coach?

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The What, Why, When, and How of Canoe Kayak Canada's

OFF-WATER TESTING

Why is Off-Water Testing Important?

- Many factors that contribute to performance can be measured in both a specific and non-specific manner
- Monitor identified performance factors that contribute to on-water performance
- Objective behind regular testing of these Key Performance Indicators (KPIs) is to assess the progress of previous training cycles and help individualize the following training cycles
- Provides great insight into which factors are important in producing great performances, and then influences how we design off-water training programs
- Furthermore, standards can be set by age group, discipline or development stage.

Canoe Kayak Off-Water Testing

1. Aerobic Power 1500m run (and 3km run for 1000m athletes)
2. Maximum Strength (low speed-strength) 3 Rep Max
 - Bench Press
 - Bench Pull
3. Maximal Power (high speed-strength) Bench pull power profile
4. Bench pull repeated power test
5. Strength Endurance: 40" pull ups (Juniors only)
6. Other Aerobic Capacity and Aerobic Power Tests:
 1. 6000m Run Test
 2. 20m Shuttle Run ("Beep Test")
 3. Cooper 12min Run Test
 4. 300m Swim Test
 5. 2 km Rowing Ergometer Test

Off-Water Testing Details

WARM UP DETAILS:

- A 15-20 minute (minimum) dynamic warm up, including 8-10 minute cardiovascular component and 7-10 minute period of dynamic movements and stretching culminating in some more challenging and explosive types of movements.

COACHES ROLE & ATHLETE SAFETY:

- As with any exercise testing attention to safety and good organization is paramount.
- Ensure the equipment is in good order and the ratio of athletes to coaches/supervisors is appropriate.
- As the athletes are being asked to perform maximally careful observation during and following each test is required. In some gym based testing spotters will be required.
- Also ensure all subjects/athletes fill in the necessary waivers and informed consents.

Which Athletes should complete these tests?

- CKC is implementing these off-water KPIs for athletes in the late train to train (16-17 years of age), through to podium potential athletes along the athlete pathway. While some of these tests are still relevant at earlier developmental stages (eg 1500m run test), CKC is currently establishing KPIs to be used at the early Train to Train and Learn to train stages.

RECOMMENDED ORDER FOR COMPLETEING TESTING:

	Junior athlete	Senior and U23 athlete
AM	<ol style="list-style-type: none">1. 3RM pull2. 3RM press3. Bench pull power4. 40" pull ups	<ol style="list-style-type: none">1- 3RM Bench Pull2- 3RM Bench press,3- Bench pull power4- Bench pull repeated power
PM	(or different day) – 1500m run	(or different day) – 1500m run 1000m athletes: + 3km run

Aerobic Power 1500m Run (1000m athletes: 3km)

PURPOSE:

- Provide assessment of maximal aerobic power, test of mental toughness and the ability to push hard for an period of time similar to on-water race distances.
- Junior Development: primary focus should still be aerobic development, and athletes should still strive to progress in this KPI
- 1000m and 200m athletes: Although Senior Gold Medal Profile times will show different benchmarks for 1000m athletes and 200m athletes, the ability to run a good time is common among all good athletes regardless of on water distance focus.
- Progress and maintenance: this test allows us to see how (non-specific) aerobic power has been maintained.

ATHLETE OBJECTIVE: run 1500m as hard as possible

BRIEF DESCRIPTION:

- The run would be ideally performed in small-medium sized groups on a track or in good weather conditions if performed outside. Total time is recorded.
- As this is a mass start time trial, athletes should certainly benefit from a competitive testing environment.

1500m Run: Programming & Relevance

Take Aways for Club Coaches

WHAT TO RECORD: The time is expressed in minutes and seconds.

EQUIPMENT REQUIRED: Stopwatch, RPE 6-20 scale, heart rate monitor on athlete.

COURSE REQUIREMENTS: 1500m indoor or outdoor course.

PROGRAMMING: When is it best to write this workout into your program?

- Fall, Winter, Spring: General Preparation phase of YTP

RELEVANCE: What do the results tell you as a coach?

- Physical: Provide assessment of maximal aerobic power,
- Tactical: shows how athlete prepares, executes, and performs in a test
- Mental: mental toughness and the ability to push hard for an period of time similar to on-water race distances.
- 1000m and 200m athletes: The ability to run a good time is common among all good athletes
- Junior athletes developing: primary focus should still be aerobic development, and athletes should still strive to progress in this KPI
- Progress and maintenance: Even when running or aerobic power is not a focus in training this test allows us to see how (non-specific) aerobic power has been maintained.

2. Maximum Strength (low speed-strength) 3 repetition maximum (3RM)

PURPOSE:

- Determine predicted 1RM (1RM to 6RM)
 - If the athlete is under 16 or unfamiliar (1 year or less) with resistance training a six repetition maximum.
- The 3RM is an established method of assessing maximum strength, provides an accurate prediction of a one repetition maximum; which is the maximum weight that can be lifted in one repetition.
- Strength relative to your body weight, or the Strength to Mass Ratio is calculated from 3 RM.

ATHLETE OBJECTIVE & BRIEF DESCRIPTION:

- This test is done in both bench press and bench pull, assessing both allows us to compare the balance between the two. Needless to say as your maximum strength goes up your 3RM should increase. The mass is expressed in kilograms.
- The weight lifted for three repetition maximum. If the athlete is unfamiliar a six to ten repetition maximum is used which is 85% of a 1RM.

	3RM	6RM
1 st warm up set	1 x 8 @ 12 RM	1 x 10 with bar
3-5 min break		
2 nd warm up set	1 x 5 @ 8 RM	1 x 8 @ 12 RM
5 min break		
3 rd warm up set	1 x 3 @ 5 RM	1 x 6 @ 10 RM
5 min break		
1 st attempt		
5 min break		
2 nd and final attempt		

Proper Technique: Bench Press & Bench Pull

BENCH PRESS

- Use a closed pronated grip slightly wider than shoulder width apart
- Movement of the bar is to be vertical from arm extension (elbows not locked) to within 2cm of the chest at the nipple level. Bar should remain parallel to the floor.
- Head, back and hips are to remain in contact with the bench, Feet are to remain in contact with the floor. A step may be used for the feet in order to keep the feet flat and keep a knee angle close to 90 degrees.

BENCH PULL

- Use a closed pronated grip slightly wider than shoulder width apart
- Movement is to be initiated from the upper back, once the bar is unracked, and a moment of pause is completed at full arm extension.
- Motion of the bar is to be vertical from full arm extension with the bar remaining parallel to the floor
- A completed repetition is when the bar comes in contact with the frame of the bench pull bench. The bench depth of the Samson high prone row bench is 12cm from the chest. This may or may not result in a sound so close attention should be paid in observing. If a Samson bench is not available tester discretion can occur on how close bar can come to frame to qualify as a completed repetition.
- Legs should remain straight and together, no advantage is to be gained by “worming” or “fish-tailing” with the body prior to the lift.

How to warm up for 3RM

	3RM	6RM
1 st warm up set	1 x 8 @ 12 RM	1 x 10 with bar
3-5 min break		
2 nd warm up set	1 x 5 @ 8 RM	1 x 8 @ 12 RM
5 min break		
3 rd warm up set	1 x 3 @ 5 RM	1 x 6 @ 10 RM
5 min break		
1 st attempt		
5 min break		
2 nd and final attempt		

Max Strength 3RM: Programming & Relevance

Take Aways for Club Coaches

WHAT TO RECORD:

- The weight including bar weight is recorded along with the completed number of repetitions provided a repetition maximum was obtained. An incomplete repetition is judged to occur when the athlete is unable to perform through the full range of motion or is unable to use proper form.

RECOMMENDED EQUIPMENT:

- Flat bench with rack, 20kg Men's barbell (outside diameter of 28mm), and selection of weight plates allowing 5kg increments.
- Allowable equipment: 15kg Women's barbell (outside diameter of 25mm), for jr athletes with smaller hands who may struggle to grip a regular bar.

PROGRAMMING: When is it best to write this workout into your program?

- Best to assess strength at the beginning of a new weight cycle during the general and specific preparation phase of the athlete's yearly training plan.

RELEVANCE: What do the results tell you as a coach?

- Having good maximum strength is important because along with velocity it contributes to generating power.

3. Maximal Power (high speed-strength)

Bench pull power profile

PURPOSE:

- Assessment of “raw” power in an easily controlled non-specific setting.
- To acquire the peak power through a progressive increase in load challenges. The beginning loads and increments can be adjusted based on your group and guidelines are suggested in table 2. The weight, including bar weight, is recorded as well as the peak power and peak velocity for each load.
- This test is also useful for tracking the power to weight relationship.
- Of course the technical ability to transfer the “raw” power into forward acceleration of the boat is of paramount importance but if you lack the ability to produce power in a non-specific setting it is unlikely you will have power in a specific setting.

ATHLETE OBJECTIVE & BRIEF DESCRIPTION:

- Following an appropriate dynamic warm-up females will begin with 30 Kg's (including the bar) and increase by 5 Kg's until the peak power drops by 40 watts or greater.
- Males will begin at 50 Kg's (including the bar) and increase by 10 Kg's until the peak powers drops 40 watts or less.
- For younger athletes and athletes who are not yet strong you may wish to start at 20kg.
- In this test the load at which a peak power (from peak velocity) can be generated is identified from a single repetition.
- The peak power is expressed in Watts.

Proper Technique: Bench Pull Power Profile

- Use a closed pronated grip slightly wider than shoulder width apart
- Movement is to be initiated from the upper back, once the bar is unracked and a moment of pause is completed at full arm extension
- Motion of the bar is to be vertical from full arm extension with the bar remaining parallel to the floor. The bar must travel upwards from the start. No dropping of the bar quickly to engage the SSC.
- A completed repetition is when the bar comes within 1cm of contact with the frame of the bench pull bench. The bench depth of the Samson high prone row bench is 12cm from the chest. This may or may not result in a sound so close attention should be paid in observing.
- Legs should remain straight and together, no advantage is to be gained by “worming” or “fish-tailing” with the body prior to the lift.
- Neck should remain in a comfortable neutral position (avoid hyperextension). Forehead may stay in contact with the bench pad (if bench design allows).
- The athlete must stop the movement of the bar in the position noted in point 3 after unracking to discouraging swinging.
- Two attempts at each load are allowed. A small break and racking is allowed if needed. There is 5 minutes of rest between loads

WHAT TO RECORD

A person is kayaking on a calm lake at sunset. The sun is low on the horizon, creating a bright glow and reflecting on the water. The sky is a mix of orange, yellow, and light blue. The water is still, and there are some reeds or grasses in the foreground.

	Jr female (+ Sr Dev female)	Female Sr	Jr Male	Male Sr
Load 1	20 kg	30 kg	30 kg	50 kg
Load 2	25 kg	35 kg	40 kg	60 kg
Load 3	30 kg	40 kg	50 kg	70 kg
Load 4	35 kg	45 kg	60 kg	80 kg
Load 5	40 kg	50 kg	70 kg	90 kg
Load 6	45 kg	55 kg	80 kg	100 kg

Bench pull power: Programming & Relevance

Take Aways for Club Coaches

RECOMMENDED EQUIPMENT:

- Flat bench with rack, 20kg Men's barbell, outside diameter of 28mm, and selection of weight plates allowing 5kg increments.
- Allowable equipment: 15kg Women's barbell outside diameter of 25mm, for jr athletes with smaller hands who may struggle to grip a regular bar.



PROGRAMMING: When is it best to write this workout into your program?

- As training focus changes based on the phase of the year, the load at which peak power occurs may change. For example, when the training focus is on maximum strength the load at peak power may be at a heavier load than if the training shifts to more speed and power type training. In this phase of training, the load at which a peak power is produced may shift to a lighter load.
- RELEVANCE: What do the results tell you as a coach?

4. Bench pull repeated power test

PURPOSE:

- “Power Endurance” measures how well peak power can be maintained over repeated repetitions
- Having a good ability to produce power over a few repetitions is indicative of accelerating the boat up to top speed.
- Being able to sustain a high percentage of peak power over a series of repetitions is indicative of sustaining the top speed of the boat. The load used is indicated below in figures 2 and 3. These loads have come from two years of data collection and are aligned with specific objectives for each group.

ATHLETE OBJECTIVE & BRIEF DESCRIPTION:

- MK 200m and MC 200m athletes perform 15 reps at 30reps per minute the objective is to produce the maximum peak power on every repetition (as judged by the sum of the peak power of each repetition, it is best not to pace).
- WK performs 30 reps at 30reps per minute with the objective of producing maximum power on each repetition.
- MC 1000m and MK 1000m perform 30 reps per minute with the objective of producing the maximum amount of work over the 1 minute, as judged by the sum of the average power for each rep (this may require some pacing).

Technique: Bench Pull Repeated Power Test

- Use a closed pronated grip slightly wider than shoulder width apart
- Movement is to be initiated from the upper back, once the bar is unracked.
- Motion of the bar is to be vertical from full arm extension with the bar remaining parallel to the floor. The bar must travel upwards from the start. No “pre-load mini rep” of the bar quickly to engage the SSC.
- A completed repetition is when the bar comes in contact with the frame of the bench pull bench. The bench depth of the Samson high prone row bench is 12cm from the chest. This may or may not result in a sound so close attention should be paid in observing.
- Legs should remain straight and together, no advantage is to be gained by “worming” or “fish-tailing” with the body prior to the lift.
- The bar is to move as fast/explosively as possible. Some recoil of the upper-body may occur but should be judged as normal based on the load and force generated. No preloading is to occur.
- A timer begins the clock upon the first movement of the bar after unracking the bar and then proceeds to call “go” every 2 seconds until the maximum repetitions have been completed or the athlete is unable to keep with the pace.
- The 200m and WK athlete is encouraged to explode (move the bar as quickly as possible) from the first repetition and every repetition thereafter. The review includes how many repetitions were completed at 90% peak power and 80% peak power. It may be advantageous to remind the athlete of this to discourage pacing.
 - The 1000m athlete is reminded that the objective for them is the most amount of work over the 2min, this may require some pacing.
- The athlete must stop the movement of the bar in the position noted in point 3 after unracking to discouraging swinging.

Bench pull repeated power: Programming & Relevance

Take Aways for Club Coaches

RECOMMENDED EQUIPMENT:

Flat bench with rack, 20kg Men's barbell, (outside diameter of 28mm), and selection of weight plates allowing 5kg increments. Allowable equipment: 15kg Women's barbell (outside diameter of 25mm), for jr athletes with smaller hands who may struggle to grip a regular bar.

PROGRAMMING: When is it best to write this workout into your program?

RELEVANCE: What do the results tell you as a coach?

Having a good ability to produce power over a few repetitions is indicative of accelerating the boat up to top speed.

Being able to sustain a high percentage of peak power over a series of repetitions is indicative of sustaining the top speed of the boat. The load used is indicated below in figures 2 and 3. These loads have come from two years of data collection and are aligned with specific objectives for each group.

Name				Location						
Date				DOB:						
Weight	kg			Discipline						
Tendo Mat #				Tendo Box #						
POWER PROFILE				REPEATED POWER TEST						
Load (lbs)	Load (kg)	Power P (W)	Vel. P (m/s)	30s, 60s or 120s test at 30rpm						
				Load (kg)						
				rep	Peak P (W)	Avg P (W)	rep	Peak P (W)	Avg P (W)	
				1			31			
				2			32			
				3			33			
				4			34			
				5			35			
				6			36			
				7			37			
				8			38			
				9			39			
				10			40			
				11			41			
				12			42			
				13			43			
				14			44			
				15			45			
				16			46			
				17			47			
				18			48			
				19			49			
				20			50			
				21			51			
				22			52			
				23			53			
				24			54			
				25			55			
				26			56			
				27			57			
				28			58			
				29			59			
				30			60			
				First Rep	0					
				min	0					
				Sum (Peaks)	0		Sum (avg)		0	
				Slope	#DIV/0!					
				Note:	Repeat bench pull - peak power recorded for WK and MK/MC200m athletes. Peak and average power recorded for 1000m athletes					
STRENGTH TESTS										
BENCH PULL (3RM)										
	kg		reps							
	lbs									
	pred 1RM	kg								
	% body weight									
BENCH PRESS (3RM)										
	kg		reps							
	lbs									
	pred 1RM	kg								
	% body weight									
	Bpr + Bpu									
	(Bpr + Bpu / BW)									
	Pp load as % 1RM									
1 RM CHART										
	RM	% of Max								
	1	100%								
	2	95%								
	3	93%								
	4	90%								
	5	88%								
	6	85%								
	7	83%								
	8	80%								
	9	78%								
	10	75%								

5. Strength endurance 40" maximum pull-ups (Junior only)

PURPOSE:

- The maximum number of pull-ups performed in 40 seconds is a good indication of strength endurance and the ability to perform anaerobic lactic power work within this time frame.
- As this test uses 100% of body weight the absolute strength of the individual will significantly dictate the requirements.
- An individual with poor strength will find the load means they are working closer to their maximum strength.
- An individual with good strength capabilities will find they are working at a lower percentage of their maximum strength.
- This test is one that is easy to perform and easy to replicate. When performed under properly controlled conditions this test can be useful in tracking an athlete's strength to weight relationship.

ATHLETE OBJECTIVE & BRIEF DESCRIPTION:

- Athlete completes maximum number of pull-ups in 40 seconds, overhand grip, no swinging is allowed. Once the athlete touches the ground the test is finished

WHAT TO RECORD: Number of pull-ups performed in 40 seconds

EQUIPMENT REQUIRED: high pull up bar

PROGRAMMING: When is it best to write this workout into your program?

RELEVANCE: What do the results tell you as a coach?

6. Other Aerobic Capacity and Aerobic Power Tests

- The following tests are other great tests for monitoring aerobic capacity development in the general preparatory phase. There are many other tests a coach can use to assess progression or improvement. However, to show progression or improvement, or assess a specific athletic ability, tests should be used at the beginning of a training block, and then at the end of a training block

6000m Run Test

- Purpose: This is an excellent indication of aerobic capacity, but not so much aerobic power.
- Protocol: similar to 1500m run test.
- Athlete objective: must run 6000m as fast as possible.
- Programming: Similar to monitoring aerobic capacity on-water, this is great test for monitoring progression around significant aerobic capacity development blocks, and maintenance of aerobic capacity.

Leger Test - 20m Shuttle Run (“Beep Test”)

- Purpose: correlates to predicting maximal aerobic capacity.
- Protocol: The test requires a gym or space that is 20m wide, as well as CD or Mp3 player (you can download the protocol now).
<http://www.brianmac.co.uk/beep.htm>
- Athlete objective: run each length pacing
- Programming:

Other Aerobic Capacity and Aerobic Power Tests

Cooper 12min Run Test

- Purpose: helps monitor and assess aerobic capacity, and can predict maximal aerobic power
- Protocol: Similar to the Leger Test, the Cooper 12 minute run test, This is another test with documented reference norms. The test requires a marked loop, such as a track, road, etc where athletes can measure the distance run in 12 minutes.

<http://www.brianmac.co.uk/gentest.htm>

- Athlete objective:
- Programming:

300m Swim Test

- Purpose: great test for both aerobic power, and aerobic capacity.
- Protocol: record athletes time swimming front crawl for 300m in a pool.
- Athlete objective: swims 300m as fast as possible.
- Programming: This is a test that has been used widely by clubs, and was used as one of the tests as part of CKC's Fitdex test.

2 km Rowing Ergometer Test

- Purpose: For athletes who are injured and cannot run for an extended period of time (eg: a training block), a 2 km time trial on a rowing ergometer is also very practical.
- Protocol: complete 2km on a rowing Erg as fast as possible
- Athlete objective: The test requires considerable involvement from the upper body muscle groups as well.
- Programming:

Next Steps for Club Coaches

Identify what equipment and resources are in your Daily Training Environment

- Information from the assessments will help coaches improve their training program.
- How we do that, is by measuring different athletic abilities – some are specific, non-specific, energy system.
- We measure these to know where an athlete is adapting, not adapting, improving physiologically, improving technically.
- The difference between testing and monitoring is the frequency in which it is done.
- Step test is a test because it is done before or after a meso cycle.
- Monitoring is done weekly.
- Why do you measure something when we are not trying to improve it? We can't measure everything all the time – but there are some things that we need to measure...
- Biggest gap between IST and club coaches: the IST needs to spend more time in our environment. The primary driver is an improvement in the relationships, understanding each other. Challenge if the club coach does not want to individualize a program. How you use the information and make a change to your program is what matters.



Thank you