

### **3. Long Term Athletic Development**

#### **Knowledge**

- i. Understand relevant aspects of LTAD theory
- ii. Explain the four properties to be developed and the seven streams of movement utilised in the ABF LTAD approach, and the key points in progressing a player through each stream
- iii. Plan suitable on-field strength and conditioning programs based on the ABF LTAD model
- iv. Plan a simple annual periodisation plan for one of his or her players

#### **Activities**

- i. Conduct a full warm up incorporating speed, acceleration and agility drills
- ii. Individualise on-field strength and conditioning according to the ABF LTAD model

#### **Instruction**

- i. the 4 properties to be developed
- ii. the 7 streams of movement
- iii. other fundamental understandings of the ABF LTAD model

## Instruct players on the 4 qualities to be developed, the 7 streams of movement and other fundamental understandings of the ABF LTAD model

**The qualities to be developed:** Four fundamental qualities form the foundation upon which excellence in movement can be built. The goal is to develop each property in every joint and in the body as a whole. These qualities overlap, but should initially be looked at as separate aspects:

1. **Stability:** the joint should move smoothly in the direction which it is intended to move: no wobbling, trembling or collapsing. A good analogy is a door hinge: if it is loose or weak, the door cannot be opened or closed as it should.
2. **Range of motion:** the joint must move freely through the full range intended.
3. **Control:** the muscles must be able to control the joint throughout the whole range. They should be able to stop and hold at any place, reverse the direction of movement, continue it, do it fast or slow; in other words, have full control.
4. **Strength:** stable movement can be controlled throughout the full range of motion against a resistance.

An individual who has developed these properties in every joint and throughout the body is well on the way to becoming a superior athlete.

**The streams of movement:** In Australian baseball, we develop these properties by grouping exercises into "streams", so called because in each stream, the exercises increase steadily in difficulty, from very simple foundational exercises to very challenging ones. There is a never-ending stream of hurdles to overcome!

The seven streams are:

1. **The double leg stream (DL):** the legs are doing the same thing at the same time. This eventually leads to the Olympic lifts, which are essential in developing maximum explosive power. Eg: Unloaded squat (bodyweight squat):
  - Feet remain flat on ground throughout the movement
  - NO wobbling of the knees (stability)
  - Knees remain directly above the feet (stability and control)
  - Back remains straight: it may lean forward, but not bend forward
  - Hips go lower than the knees: many will be unable to do this, but that is the goal
  - Ultimately, they should be able to get the buttocks down near the heels: this is an example of full range of motion.



2. **Single-leg (SL):** exercises in which, at any given time, each leg has a slightly different task. Since this is the way we generally use our legs in life (eg walking) and in a game, this stream produces significant on-field benefits. Eg: single leg (SL) supported squat:
- Place the rear foot “laces down” on a chair or bench behind the player
  - Front foot is well away from bench.
  - Bending the front leg, lower the back knee to barely graze the ground.
  - NO wobbling, particularly front knee (stability).
  - Keep trunk upright throughout the movement.



3. **Jumping:** develops dynamic balance, coordination and power. Eg: Double-leg (DL) take-off to DL landing:
- The most important part of all jumping exercises is the landing.
  - ‘Stick the landing’: land under full control, feet flat on ground, knees behind toes, glutes act as shock absorbers, trunk strong
  - Start in half-squat posture, jump forward and land in the same posture
  - Distance is only important once the landing has been mastered: “make sure you can land before you try to fly”.



4. **Pushing:** upper body exercises where weight is moved away from the body (or the body away from a resistance: eg, a pushup). Eg: knee pushups:
- Hands on ground a little either side of the chest. Throughout the movement, the body is held rigid from shoulders through to knees.
  - Using the arms only, push on the ground until arms are fully extended.
  - Lower the body under control and repeat.



5. **Pulling:** upper body exercises where weight is moved towards the body (or the body toward a fixed object: eg, a chin-up). Improvement in this stream is far more important to baseball than the previous stream. Eg: cable pullups:
- This exercise is like a reverse pushup.
  - Equipment needed: a 3m piece of strong rope with a handle at each end (a loop tied through a piece of hose for a handle will do). This rope is wound around a high horizontal bar with the handle hanging low enough for the player to be able to reach while lying on the ground.
  - The player lies on his back, holds the handles, and keeping the body rigid, pulls himself up, instead of pushing up off the ground.
  - Many will need to start from a higher position, so that the body is at about 45 degrees, instead of horizontal



6. **Shoulder function:** Exercises which improve the function of this critical joint. The rubber tubing exercises are an example. Another eg: lying supermans:
- Lying on stomach with the shoulders, elbows and wrists lifted as high as possible off the ground, arms bent and fingers pointing forward past the head (as if in a horizontal surrender posture).
  - Slowly extend the arms slowly out in front of face, then pull slowly back, keeping elbows, wrists and hands high off the ground throughout.



7. **Core:** exercises to develop the function of the trunk Eg: knee-planks
- Assume bent-leg sit-up posture, with hands resting on thighs.

- Perform abdominal curl, sliding hands up thighs until wrists reach knees.
- ⌘ Reverse movement under control, and repeat



**Fundamental understanding:**

1. There is certainly overlap between the streams (particularly as one progresses), but to ensure complete coverage, the player should do at least one exercise from each stream in each session.
2. Each individual progresses in each stream in their own way, according to individual strengths and weaknesses, independently of the others. One player may be further up the Single Leg stream than the Pulling stream, for example; while another player may be quite the reverse. Each must be encouraged to work on the weaker streams in order to become a more competent athlete.
3. If one is to gain maximum benefit and minimise the risk of injury, it is important not to rush progress. The individual should have full mastery of one exercise before moving on to a more challenging one. We are seeking permanent and systematic adaptation.

## Conduct a full warmup incorporating speed, acceleration and agility drills

This looks very involved, and time-consuming, but it is much more than a warmup. It incorporates important exercises for developing fundamental movement skills and athleticism.

**Moving:** (in lines from outfield foul line; 5-20m each way)

1. side skips (with arm swings)
2. 360s
3. Carioca
4. Frankensteins
5. Walking knee circles
6. Butt kicks (out) and then reverse butt kicks (coming back)
7. Side squats
8. 2 lunges and 3 skips

**Sprint mechanics drills:**

9. Walking Knee-to-chest stretch
10. Lunge walk with high knee
11. Sprinter's march
12. A-skip
13. 3s

**Acceleration drills**

14. 3-point starts (2' each side)
15. Steal starts (3 x)
16. flying 5m sprint (3 x)
17. 10m beach flag starts (3 x)

**Stationary:**

18. shoulder retraction and protraction (5-10)
19. resisted shoulder rotations
20. resisted elbow extension and flexion
21. arm marches (5 each side)
22. scapula supermans (5-10)
23. swimmers (5 each side)
24. reverse swimmers (5 each side)
25. Arm swings (5 of each): up and down; across and back; goals posts; back pats; trunk twists



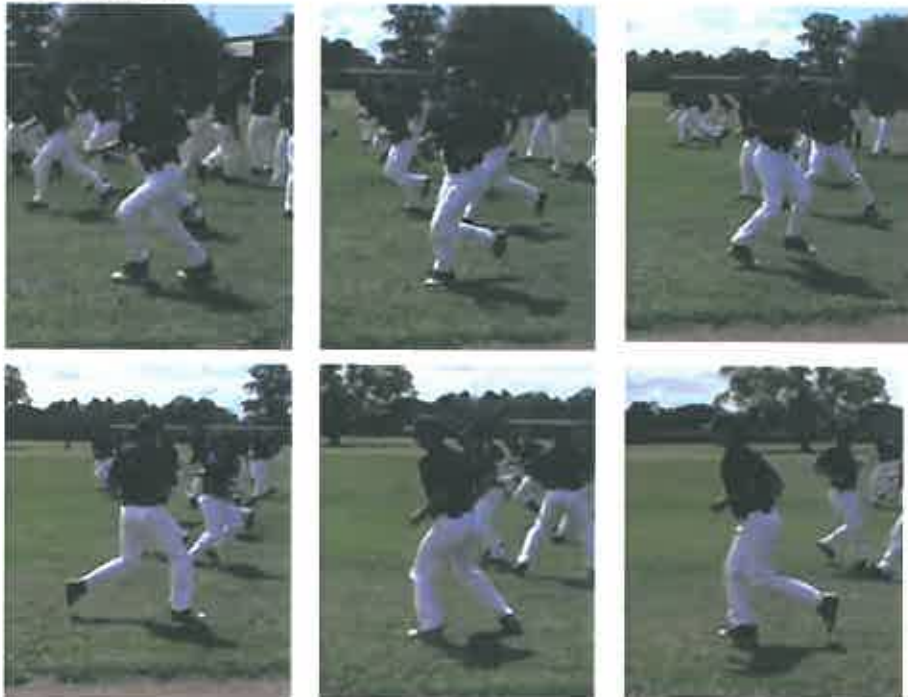
## Teach correct execution of each exercise in the LTAD warmup

**Moving:** (in lines from outfield foul line; 5-20m each way):

1. side skips (with arm swings)
  - Stay lateral
  - Arms swing laterally from side of hip to above shoulder-height
  - Be smooth and rhythmic



2. 360s
  - Rotate fully while jogging, maintaining speed
  - Alternate directions



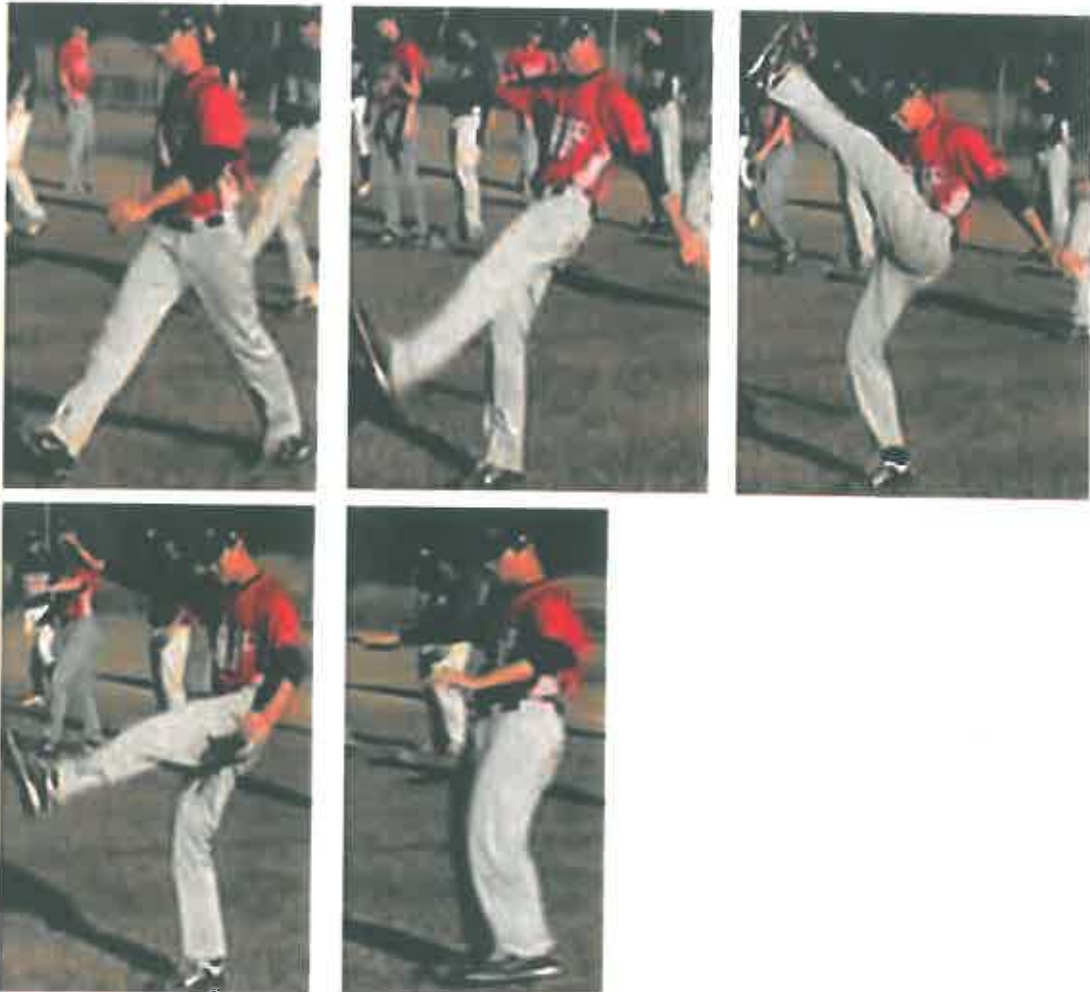
### 3. Carioca

- Move sideways (not  $\frac{3}{4}$ )
- Trailing foot goes in front of other foot on one step, behind on the next
- Be smooth and rhythmic



### 4. Frankensteins

- Alternate legs in a high front kick, stretching the hamstrings
- Control leg coming back down: keep it in the air for a short pause, then step onto that foot and swing other leg forward and up.
- Keep trunk up right and strong throughout





5. **Walking knee circles**

- Maintain control on support leg
- Work to keep trunk in upright posture
- Move circling knee through best range of motion (without moving trunk)



6. **Butt kicks (out) and then reverse butt kicks (coming back)**

- Trunk and head stay steady
- Support leg firm and fully extended



**Sprint mechanics drills:**

7. **Walking Knee-to-chest stretch**

- Alternatively pull each knee to chest while fully extending the support leg.
- Take one step forward between each repetition.



8. Lunge walk with high lift

- Lowest position: trunk upright, long lunge with no wobbling, rear knee brushing ground, front knee remains behind front toe
- Highest position: no wobbling, support leg fully extended, other leg fully folded up.



9. Sprinter's march

- Remain tall throughout, taking short steps and adhering to high position described in lunge walk.
- Stress upright posture



10. A-skip

- Rhythmic version of Sprinter's March, with a small, rhythmic skip between each step.
- Emphasise folding the recovering leg up fully (see above): "toe over knee".

11. "3s"

- Jogging under control, rapidly lift and put down one leg every 3<sup>rd</sup> step (hence the name "3s"), using vigorous arm action at the same time.
- Emphasise getting that foot all the way up (toe over knee) and all the way down quickly.



Acceleration Drills

## 12. Three-point starts

- Starting posture for this drill is important
- To get into correct posture, put one knee on the ground and the other foot beside it.
- The hand on the same side as the knee-down leg is about 20cm in front
- On the "Set!" command, the player raises the hips until they are higher than the shoulders, leaning forward and taking a moderate amount of weight on the supporting hand. The other hand is moved back up higher than the hip of the forward leg.
- On "Go!", the player explodes out of the blocks, with a heavy emphasis on powerful arm action: on the initial explosion, the hand that was back should swing fully and powerfully over the head. The arm swing graduates back to normal sprinting range after the first couple of steps.
- Accelerate as hard as possible for 5-15m



## 13. Steal starts

- Starting in lead-off posture
- On "Turn!" command, turn the body to 2<sup>nd</sup> base, ensuring the head is moved out to the 2<sup>nd</sup> base side of the feet; the right hand is moved well back past the right hip, in the same position used in 3-point starts.
- On "Go!" the player accelerates as explosively as possible, using vigorous, large arm swings for the first few steps.
- Once familiar with the drill, the players may turn and go in one motion. The emphasis on full arm action to assist acceleration must be maintained.



**14. Flying 5m sprint**

- **Players take a running start so as to be at top speed by 1<sup>st</sup> marker**
- **Run at absolute top speed to the 2<sup>nd</sup> marker (5m distance)**



**15. 10m beach flag starts**

- **Players lie chest down with both hands under chin, facing the direction to be sprinted**
- **At coach's call, get up as quickly as possible and accelerate hard past marker (10m distance)**



**Stationary:**

**16. Shoulder retraction and protraction**

- Standing with arms extended forward at shoulder height
- Push shoulder forward, then pull them back as far as possible
- Emphasise maximum movement of the shoulder blade



**17. Arm marches**

- Face down in pushup position, arms extended
- Alternatively touch hand to same side shoulder
- Try to hold trunk as still as possible throughout



**18. Lying supermans**

- Lying on stomach with the shoulders, elbows and wrists lifted as high as possible off the ground, arms bent and fingers pointing forward past the head (as if in a horizontal surrender posture).
- Slowly extend the arms out in front of face, then pull slowly back, keeping elbows, wrists and hands high off the ground throughout.



#### 19. Swimmers

- Face down in pushup position, arms extended
- Alternatively touch hand to same side hip
- Try to hold trunk as still as possible throughout



#### 20. Reverse swimmers

- Face up on hands and feet, trunk off ground, knees bent, arms extended
- Alternatively touch hand to opposite side shoulder
- Try to hold trunk as still as possible throughout



21. Arm swings. Keeping arms as tension-free as possible, swing them:  
○ up and down, in unison, then one up, one down



- across and back at chest height



- goals posts: cross arms in front, swing them then up and back to surrender position (stretches the pecs)



- back pats: alternatively swing arms up beside head, bending elbow to pat yourself on the back (stretches triceps)



○ trunk twists: let arms swing like ropes while rotating trunk one way then the other





## Plan suitable on-field strength and conditioning programs based on the ABF LTAD model

The ABF's LTAD approach to exercise can be used for any age group, because at all times, the individual is working on mastering the appropriate exercise in each stream.

Your job as a coach (and a member of a club) is to:

1. **Learn the material:** know the 4 properties, the 7 streams and the requirements for progressing to the next exercise. Suggested progressions are available from the ABF. Keep in mind that most of the exercises are to be done at slow to moderate speed: the player should concentrate on stability, range of motion and control; let strength come by itself.
2. **Organise the equipment required at the field:**
  - **Double leg stream:** no equipment needed at introductory level. Later on, some weight is required: sandbags, car tubes filled with sand etc are safe and practical options (injury from dropping these is unlikely).
  - **Single leg:** benches to put back foot on or to stand on as players progress are useful. May also use weights mentioned in DL stream.
  - **Jumping:** no equipment needed. Can use low hurdles later on.
  - **Pulling:** bar or similar needed for chinning; low bar or "cables" needed for horizontal pullups. Each player could have their own: individual "cables" can be made from a 3m piece of strong rope with a loop tied at each end (tie the loop through a piece of hose for greater comfort). The cable is looped over a high bar so that the player can lie face up underneath and pull themselves up.
  - **Pushing:** no equipment needed. Variations of the pushup will suffice.
  - **Shoulder function:** rubber tubing or light hand-weights needed. The latter can be manufactured by filling small juice bottles etc with sand.
  - **Core:** no equipment needed.
3. **Implement the program!** Put it in every training session: it's one of the best things you can do for your players.



## Individualise on-field strength and conditioning according to the ABF LTAD model

If the LTAD model is applied strictly, each player will be concentrating on mastering the “perfect” exercise for him or her in each stream. Progress must be earned, for safety reasons and because it then becomes very motivational.

1. Know the 4 properties to be develop
2. Know the streams
3. Know the exercises
4. Know the rules for progressing
5. Know how to assess: look for the presence of each property

Keep a record of where each player is up to in each stream, then supervise to ensure that they are focusing on the right things.



## Plan a simple annual periodisation plan for one of his or her players

“Periodisation” is a term used for the practice of breaking the training year into different phases in order to

- maximise overall progress
- reduce overuse injuries
- make sure that peak performance is achieved at the right time
- minimise boredom and staleness.

It can get very complex, but in its simplest form, periodisation for baseball can follow these guidelines:

1. **Post-Season (2-6 weeks). Rehab any injuries, but try not to lose any conditioning**
  - A short period of absolute rest, if needed. Review the season, plan your work etc (1-2 weeks)
  - Active rest: time away from the usual training regime; staying active without putting the same old stresses on the body: golf, swimming, hiking etc(4-5 weeks)
2. **Off-Season (12-20 weeks). Build technique and physical properties.**
  - Make any significant technique adjustments: swing mechanics, throwing etc
  - Develop mental skills
  - improve athleticism: coordination activities; build strength, power, speed, agility, range of motion
  - do more specific baseball stuff in the latter part of this period
3. **Pre-Season (4-8 weeks). Prepare for the season**
  - Baseball-specific drills
  - Condition yourself to the specific stresses of the game and/or season
  - Simulated competition, including pre-season games
4. **In-Season. (12-30 weeks). Maintain the body and the mind.**
  - Trust your preparation and concentrate on competing
  - Use daily and weekly routines to maximise recovery from one game and preparation for the next