

Youth Sport in Australia and the Introduction of Resistance Training

Presented by

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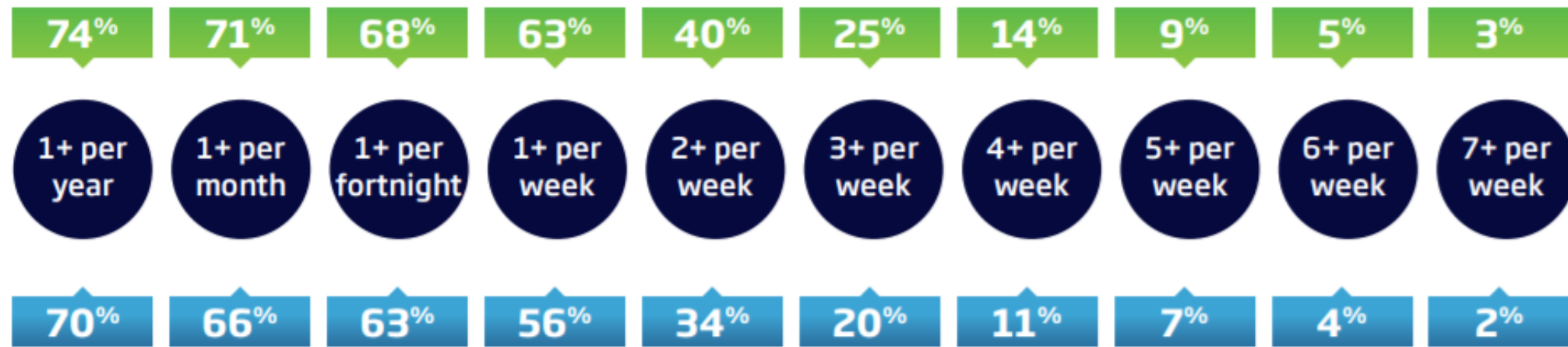
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Overview

- ▶ **Youth sport in Australia**
- ▶ **Resistance training in children and adolescents**
- ▶ **Foundations of successful long term athlete development**
 - ▶ **Reductions in injury**
 - ▶ **Combating burnout in youth athletes**
 - ▶ **Training to Train**
- ▶ **Implementation of Strength Training**
 - ▶ **General Guidelines**
 - ▶ **Exercise Selection**
 - ▶ **Movement stream progression**

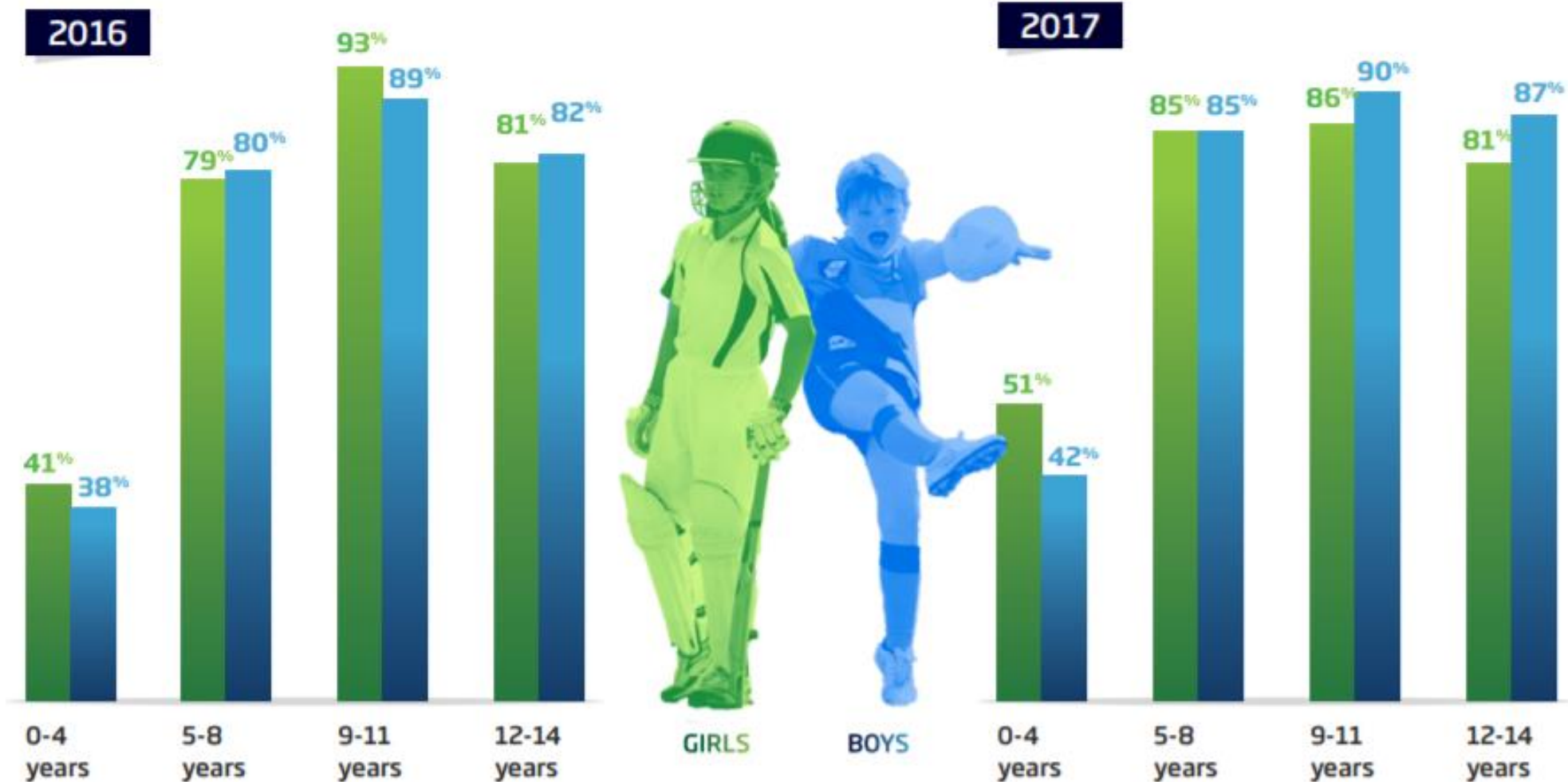
Participation in Organised Physical Activity

2017



2016

Child participation by age and gender*



*At least once per year

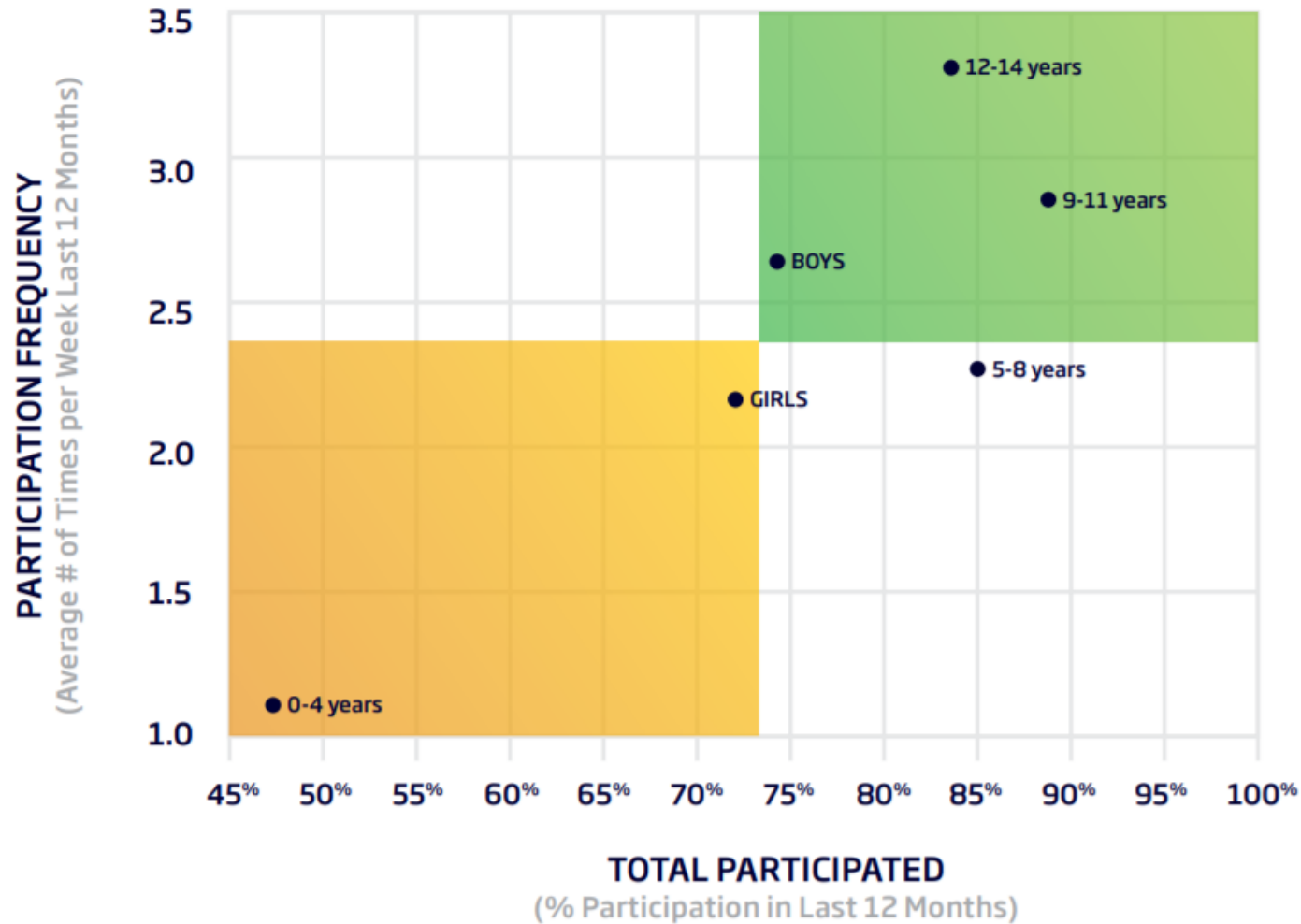
Participation Trends



AGE GROUP	GIRLS		BOYS		
0-4 years	Swimming	35.8%	Swimming	31.6%	Learning to swim is the most common organised out-of-school physical activity for very young children, although a significant proportion of 0-4 year old girls participate in recreational dancing and/or gymnastics.
	Dancing (recreational)	15.5%	Football/soccer	6.6%	
	Gymnastics	6.2%	Gymnastics	4.1%	
	Dance sport	2.4%	Athletics, track & field	1.9%	
	Yoga	1.4%	Fitness/Gym	1.4%	
5-8 years	Swimming	48.6%	Swimming	38.6%	Swimming remains the most common organised physical activity for 5-8 year olds. While girls continue to participate in gymnastics and dancing, 10% of girls aged 5 to 8 years play netball. Similarly, boys aged 5-8 years are starting to participate in more team sports.
	Gymnastics	22.8%	Football/soccer	26.6%	
	Dancing (recreational)	18.0%	Australian football	21.5%	
	Netball	10.3%	Cricket	10.5%	
	Dance sport	8.8%	Rugby league	7.1%	
9-11 years	Swimming	31.7%	Football/soccer	29.8%	Children aged 9-11 years have the highest sport participation rates. Team sports (particularly football for boys and netball for girls) are increasingly important.
	Netball	23.9%	Swimming	29.7%	
	Gymnastics	11.8%	Cricket	15.9%	
	Dancing (recreational)	11.7%	Australian football	15.4%	
	Basketball	10.1%	Basketball	15.1%	
12-14 years	Netball	30.6%	Football/soccer	27.4%	Most children aged 12-14 years are in high school. Swimming is much less popular in this age group and does not feature in the top 5 activities for boys this age. Football is the most popular sport amongst boys, while netball is the most popular sport amongst girls.
	Basketball	12.4%	Australian football	22.1%	
	Dancing (recreational)	11.8%	Basketball	18.0%	
	Swimming	11.7%	Cricket	17.4%	
	Football/soccer	9.1%	Tennis	11.5%	

Participation and frequency (2017)

Age and gender



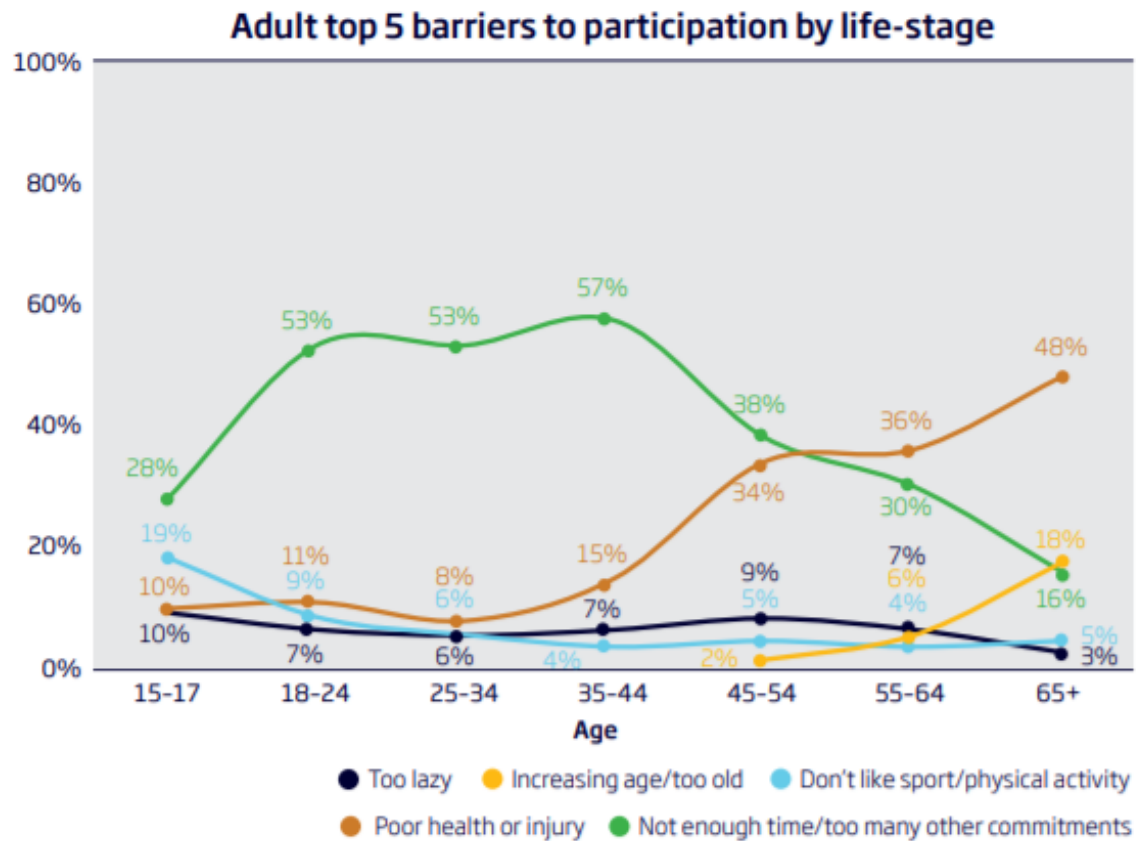
Resistance training in children and adolescents

Potential Benefits of Youth Resistance Training

- Increase muscle strength and power
- Increase local muscular endurance
- Increase bone mass
- Increase cardiorespiratory fitness
- Improve blood lipid profile
- Improve body composition
- Improve motor performance skills
- Enhance sports performance
- Increase resistance to injury
- Enhance mental health and well-being
- Stimulate a more positive attitude toward lifetime physical activity

- ▶ Childhood and adolescence may be the opportune time for the bone-modeling and remodeling process to respond to the tensile and compressive forces associated with weight-bearing activities.
- ▶ Concerns that resistance exercise would cause harm to the growth plates of youth weight trainers have been replaced by observations that indicate that the mechanical stress placed on developing growth plates from weightbearing exercise or high-strain-eliciting sports are actually essential for bone formation and growth.
- ▶ This type of physical activity during periods of growth and development may be most beneficial because the mechanical stress from weight-bearing activities may act synergistically with growth-related increases in bone mass, resulting in a higher bone mass later in life.

Foundations of successful long term athlete development



Reduces Injury

Reductions in injury

- ▶ 5090 basketball & 4596 netball-related hospital admissions
- ▶ 34.3% (basketball), 56.4% (netball) due to dislocation, sprain or strain of joints or ligaments of knee
- ▶ 45% of all hospitalisations due to rupture of the ACL.
- ▶ ACL injuries increased by 147.8% from 2.74 per capita in 2005/2006 to 6.79 per capita in 2014/2015.
- ▶ 96.9% of these injuries were in 10 to 14-year-olds.



ACL injury mechanisms and corrections

Mechanism

- ▶ Forceful valgus collapse from a position with the knee close to full extension combined with slight rotation of the tibia
- ▶ Hip abduction, hip internal rotation, knee flexion, and knee extension strength are the strongest predictors of frontal plane knee motion (valgus collapse).

Correction

- ▶ ↑ in Hip abduction, hip internal rotation, knee flexion, and knee extension strength = ↓ knee valgus during single leg squatting and landing
- ▶ Strength training alone does not reduce ACL loading.
- ▶ Comprehensive neuromuscular training that includes weightlifting, plyometrics, core stability and balance training elicits decreases in ACL injury risk factors.

Foundations of successful long term athlete development



Provides accomplishment
and enjoyment

Reduces Injury

Combating burnout in youth athletes

- ▶ Burnout is described as withdrawal from an activity that was **previously enjoyable** due to stress or dissatisfaction (Smith, 1986).
- ▶ Raedeke (1997) extended this definition as a psychological condition associated with feelings of emotional and/or physical exhaustion, **a reduced sense of accomplishment**, and sport devaluation.
- ▶ Holloway et al and Annesi et al reported significant improvements in self-efficacy and general self-esteem in untrained adolescent girls who participated in a 12-week resistance training or physical activity program.
- ▶ The potential impact of resistance exercise on selected psychosocial measures in youth will depend on the design of the exercise program as well as the initial levels of muscular strength and psychological well-being.

Foundations of successful long term athlete development

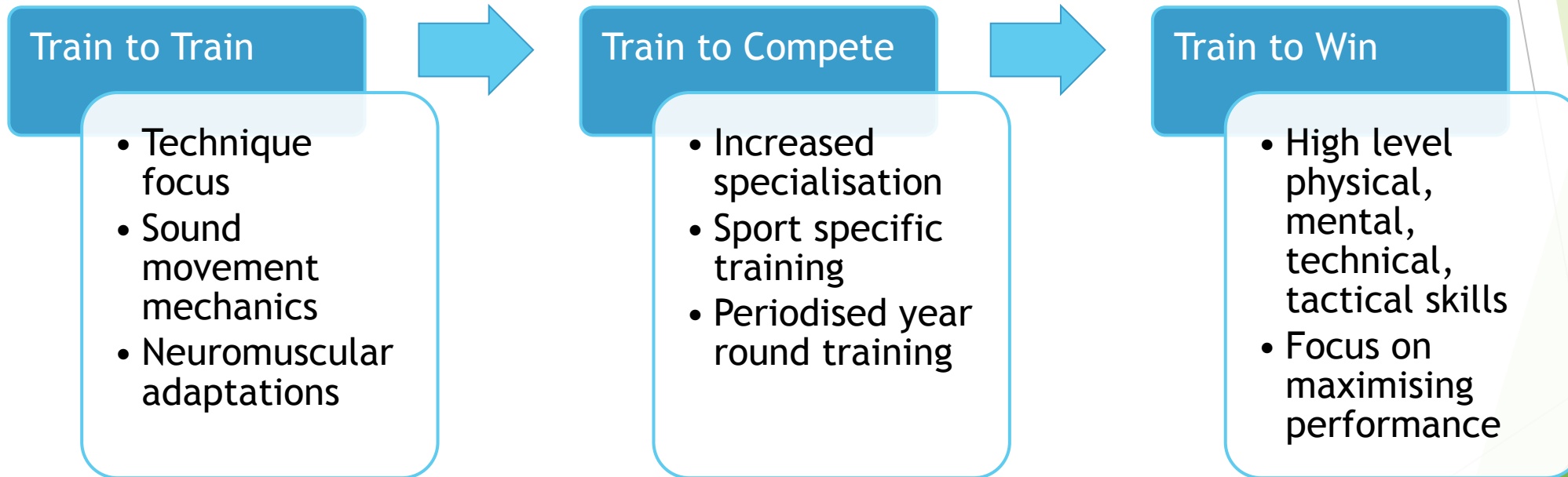


Foundation for
further training

Provides accomplishment
and enjoyment

Reduces Injury

Long term athlete development

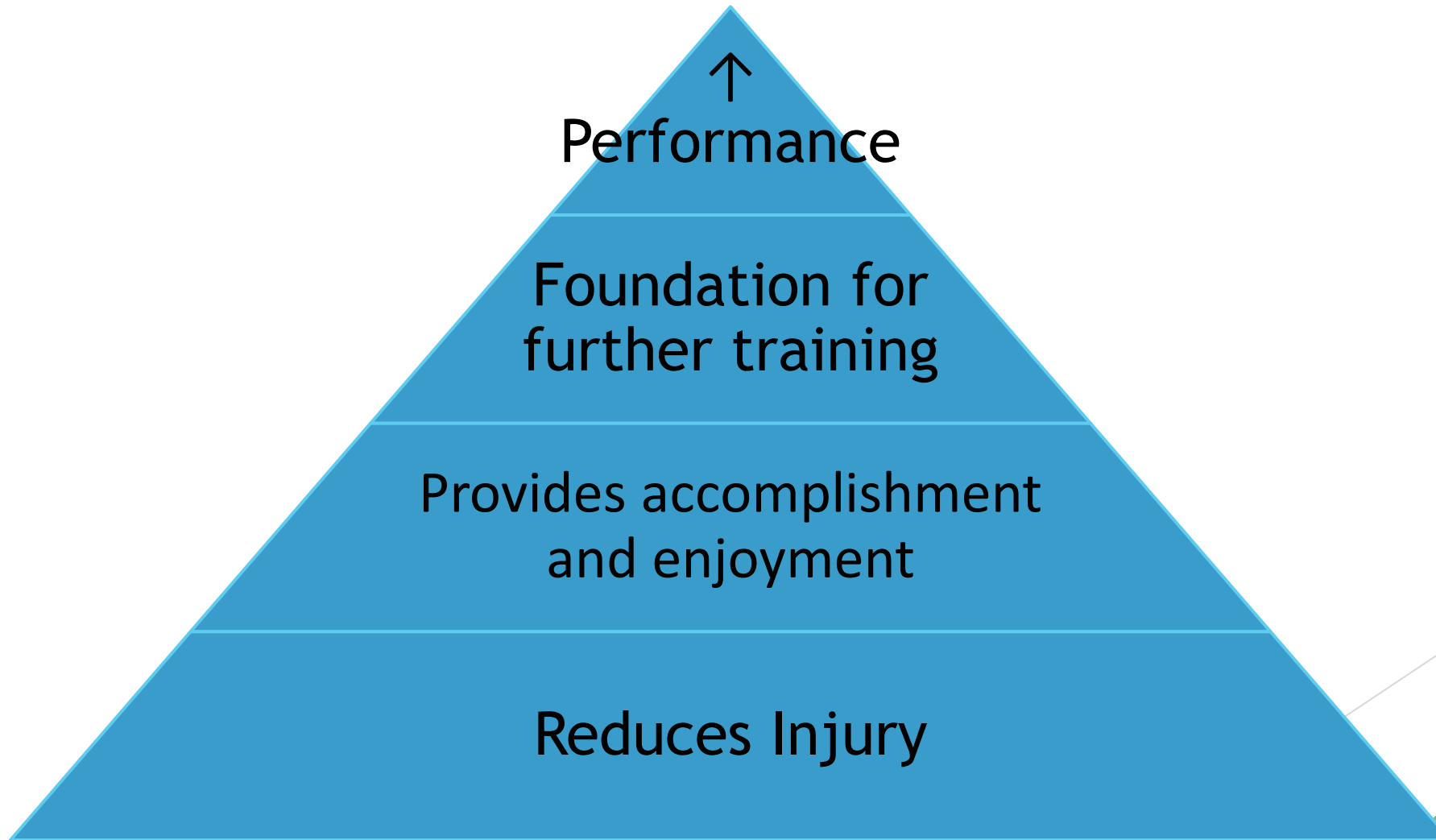


Training to Train

- ▶ Development of high quality mechanics in a variety of general athletic movements.
- ▶ Particular focus on development of sprinting, landing and squatting technique.
- ▶ Move in multiple planes.
- ▶ Neuromuscular adaptations > hypertrophy



Foundations of successful long term athlete development



Implementation of Strength Training

- ▶ **Provide qualified instruction and supervision**
- ▶ Start each training session with a 5- to 10-minute dynamic warm-up period
- ▶ **Begin with relatively light loads and always focus on the correct exercise technique**
- ▶ **Perform 1–3 sets of 6–15 repetitions on a variety of upper- and lower-body strength exercises**
- ▶ Include specific exercises that strengthen the abdominal and lower back region
- ▶ Focus on symmetrical muscular development and appropriate muscle balance around joints
- ▶ Sensibly progress the training program depending on needs, goals, and abilities
- ▶ **Increase the resistance gradually (5–10%) as strength improves**
- ▶ Cool-down with less intense calisthenics and static stretching
- ▶ Listen to individual needs and concerns throughout each session
- ▶ **Begin resistance training 2–3 times per week on non-consecutive days**
- ▶ Use individualized workout logs to monitor progress
- ▶ **Keep the program fresh and challenging by systematically varying the training program**
- ▶ Optimize performance and recovery with healthy nutrition, proper hydration, and adequate sleep
- ▶ Support and encouragement from instructors and parents will help maintain interest

Exercise Selection

- ▶ Lower Body

- ▶ Squat pattern or Hip Hinge
- ▶ Single or double leg
- ▶ Sagittal or frontal plane
- ▶ Open or Closed Kinetic Chain

- ▶ Upper Body

- ▶ Push or Pull
- ▶ Vertical or Horizontal

- ▶ Day 1

- ▶ Squat Jumps - SP, DL, SP, OKC
- ▶ Single Leg DL - HH, SL, SP, CKC
- ▶ Lateral Lunge - SP, SL, FP, CKC

- ▶ Day 2

- ▶ Step Ups - SP, SL, SP, CKC
- ▶ Hip Thrusters - HH, DL, SP, CKC
- ▶ Skater Jumps - SP, SL, FP, OKC

Movement stream progression

Single leg squats

- ▶ Sprinter Holds
- ▶ Touch Down Squat
- ▶ Step Up
- ▶ Loaded Step Up
- ▶ Pistol Squat

Double leg squats

- ▶ Body weight squat
- ▶ Goblet squat
- ▶ Front squat
- ▶ Back squat
- ▶ Overhead squat