

Making an **impact!**

Torquay, February 27, 2007



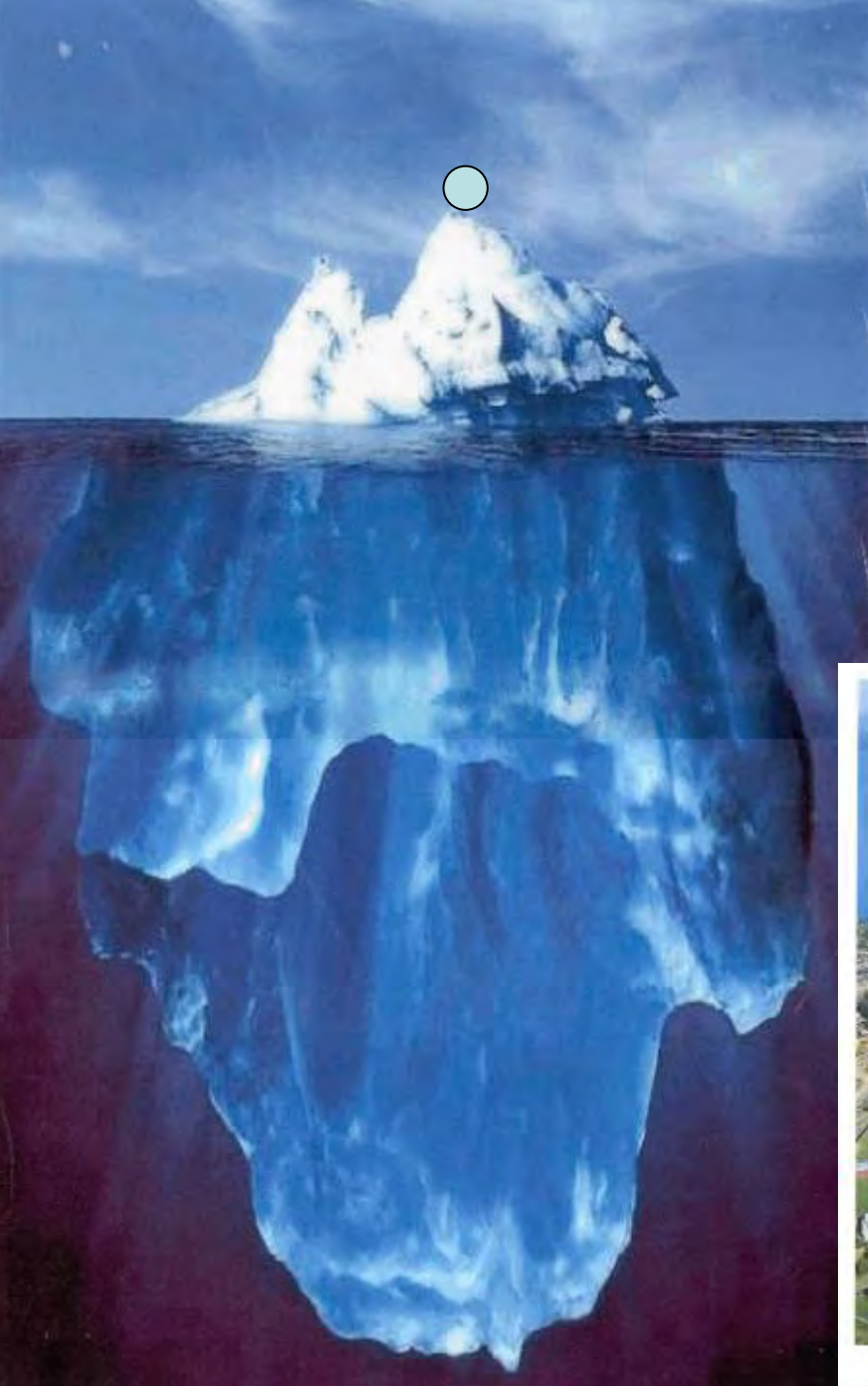
Sustaining Participation Workshop

Istvan Balyi
Sport Canada LTAD Group
scUK LTAD Consultant



Once a sprinter always a sprinter ...



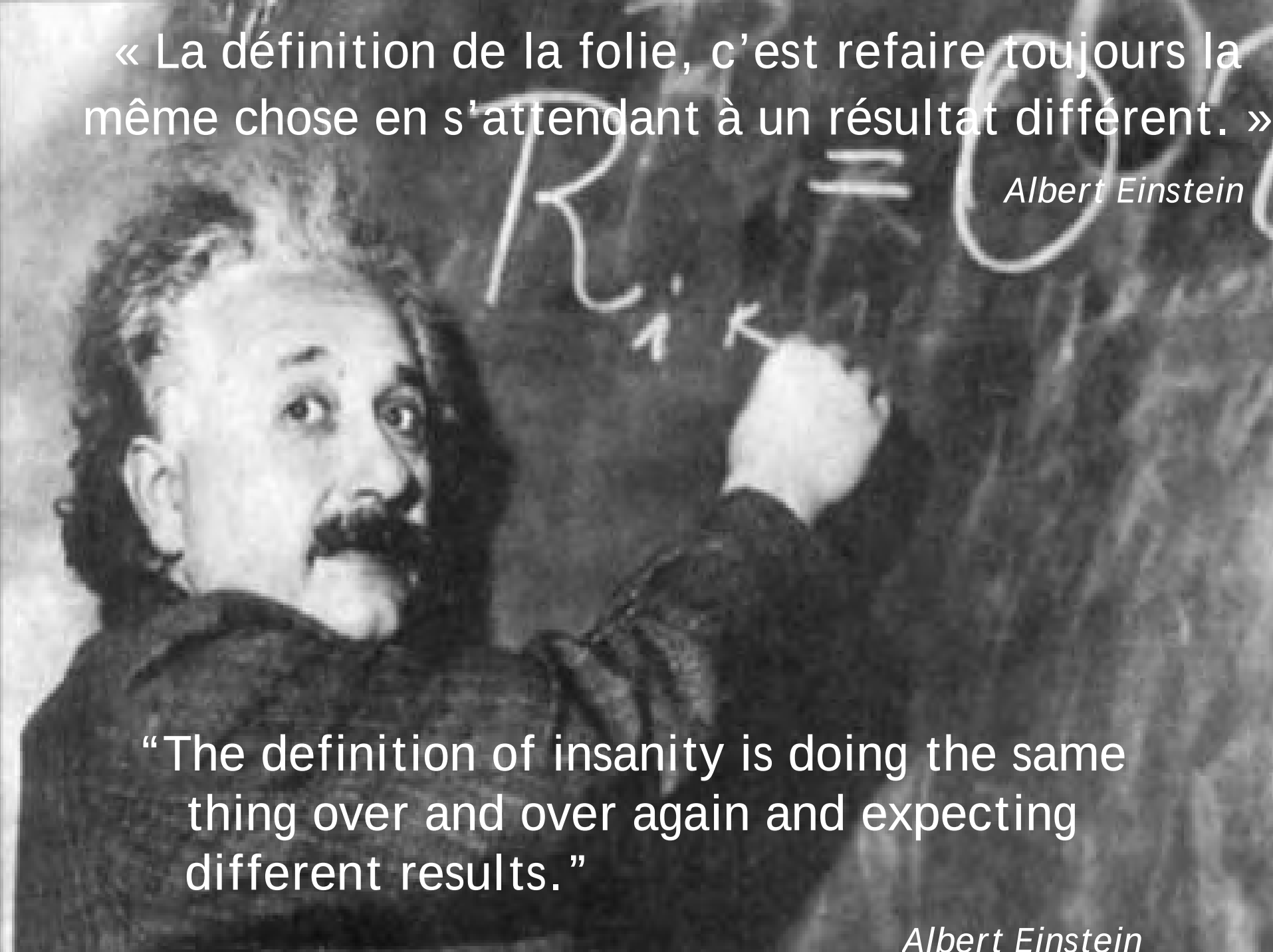


The University of Victoria National Coaching Institute 45 hours



insanity

doing the same
thing over and
over and expecting
different results

A black and white photograph of Albert Einstein. He is shown from the chest up, turned slightly to his right, pointing his right index finger towards a chalkboard. He has his characteristic wild, white hair and a mustache. On the chalkboard behind him, there are mathematical equations written in chalk. The most prominent one is $R_{\mu\nu} = 0$, with two arrows pointing from the right-hand side towards the indices μ and ν on the left-hand side. Other faint equations are visible in the background.

« La définition de la folie, c'est refaire toujours la même chose en s'attendant à un résultat différent. »

Albert Einstein

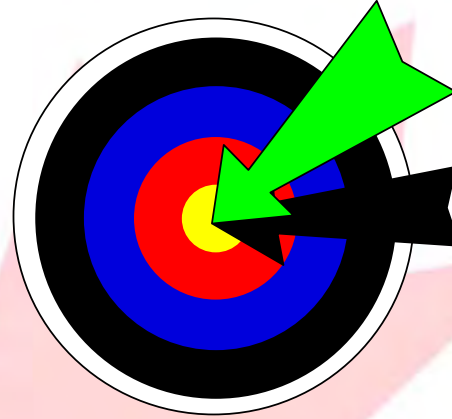
“The definition of insanity is doing the same thing over and over again and expecting different results.”

Albert Einstein



Unbeknownst to most historians, Einstein started down the road of professional basketball before an ankle injury diverted him into science.

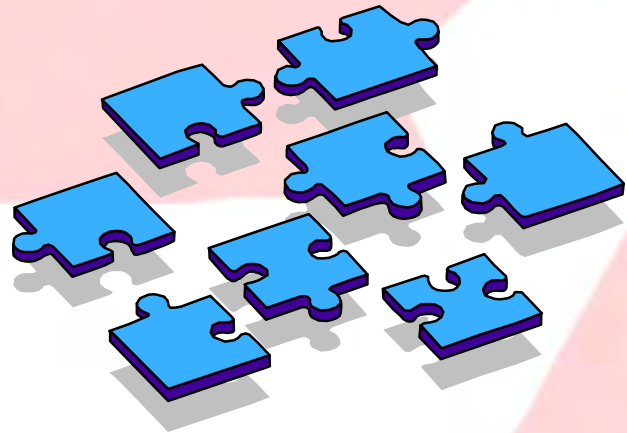
Objectives



- **Recapping LTAD**
- **Relative Age and Developmental Age**
- **Review the impact of Growth and Maturation on programme planning**
- **How to “operationalise” LTAD**
- **Conclusion and recommendations**

LTAD Process

- **Sport England 2002-2006 = “What is LTAD?”**
 - 19 sports / 13 sports published...
 - 4 completed but not published...
- **sportscoachUK 2006 = “How to LTAD?”**



- **If you want to teach latin to Johnny, you have to know latin and you have to know Johnny**
- **If you want to teach badminton to Johnny, you have to know badminton and you have to know Johnny**
- **We know badminton very well BUT we do not know Johnny or Jane from age 9 to 16 – PERIOD!!!**



Athlete Development and Support Programmes

Athlete
Development

T2W

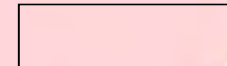
T 2 C

T 2 T

FUNdamental



Support system - Knowledge base
Budget

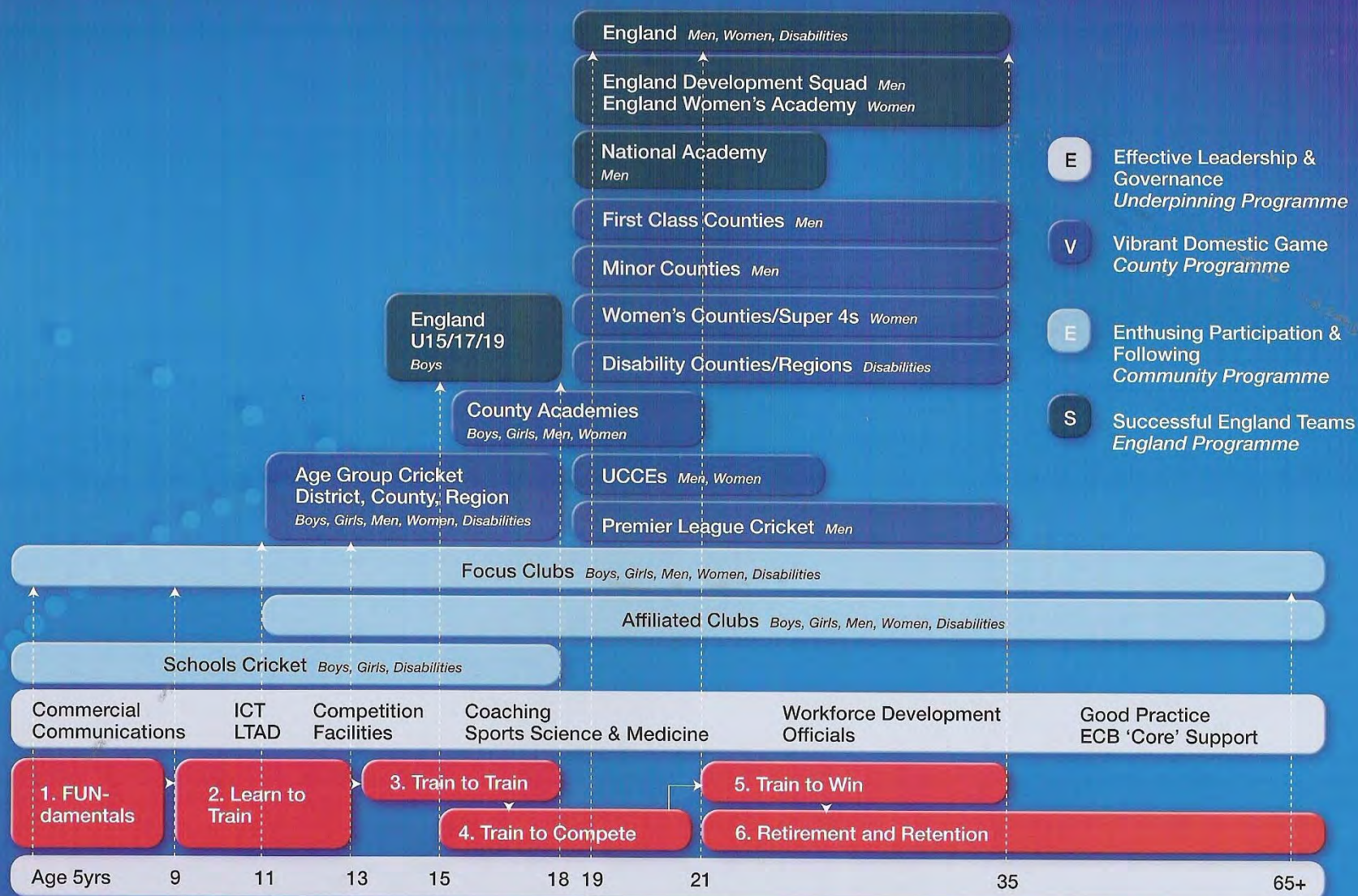


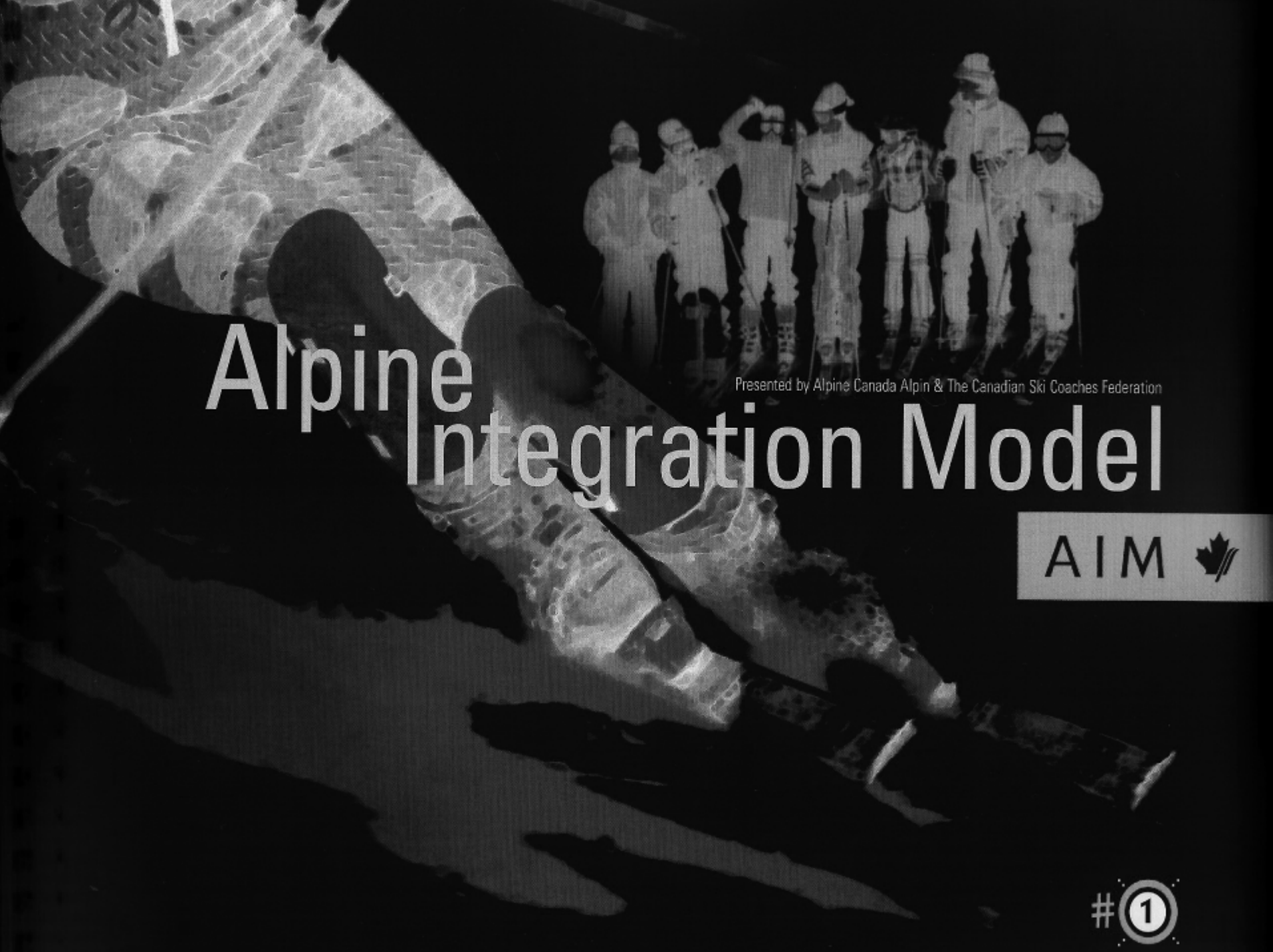
LTAD is

- Optimal training, competition and recovery programming with relation to biological development and maturation
- Equal opportunity for recreation and competition, **it is not an elitist model**
- Tool for system change



Strategic Plan for Cricket 2006–2010: Player Pathway and Programmes





Alpine Integration Model

Presented by Alpine Canada Alpin & The Canadian Ski Coaches Federation

AIM 

#1

The Long-Term Player/Athlete Development Model (LTPAD)



NATIONAL
COACHING & TRAINING
CENTRE



The six phases of LTPAD

1. **FUNDamental** - build overall motor skills
2. **Learning to Train** - learn all fundamental sports skills
3. **Training to Train** - build 'the engine' and consolidate sport-specific skills
4. **Training to Compete** - fine-tune 'the engine', skills and performance
5. **Training to Win** - maximise performance, skills and 'engine'
6. **Retirement / Retainment** - adjustment/retain players/athletes for coaching/ administration

INTERNATIONAL WORKSHOP
INTERNATIONAL ATHLETIC FOUNDATION



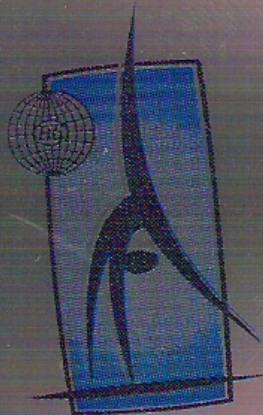
The Future of Youth Athletics

Madrid, Spain
22/23 September 2002

FÉDÉRATION INTERNATIONALE DE GYMNASTIQUE



FONDÉE EN 1881



CD-ROM DADR 1PMU1<0842>2062
19910908

AGE GROUP DEVELOPMENT PROGRAM.
PROGRAMME DE DEVELOPMENT DE GROUPE D AGE.
PROGRAMA DE DESARROLLO PARA GRUPOS DE EDADES.



THE FRAMEWORK FOR SPORT IN ENGLAND

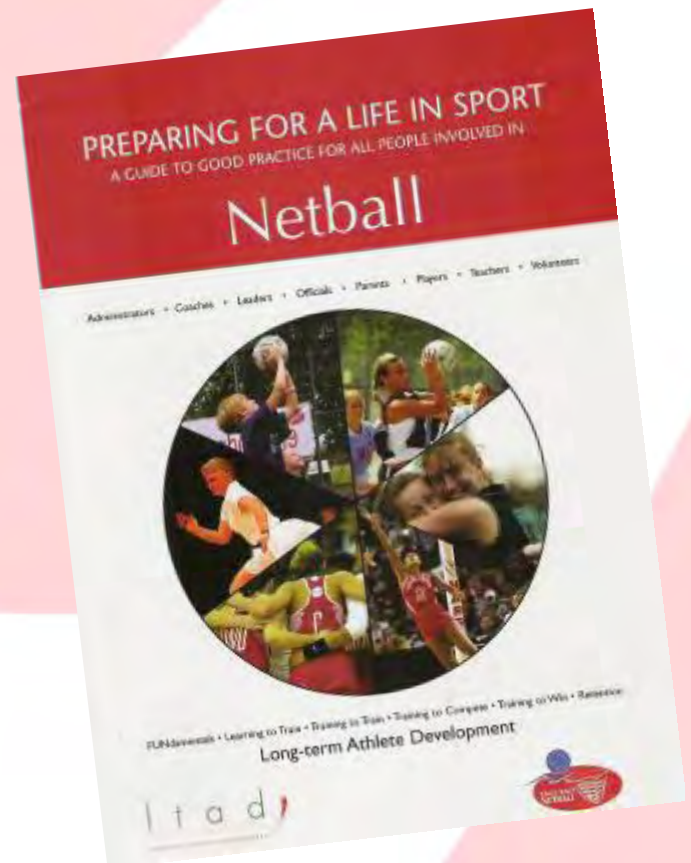
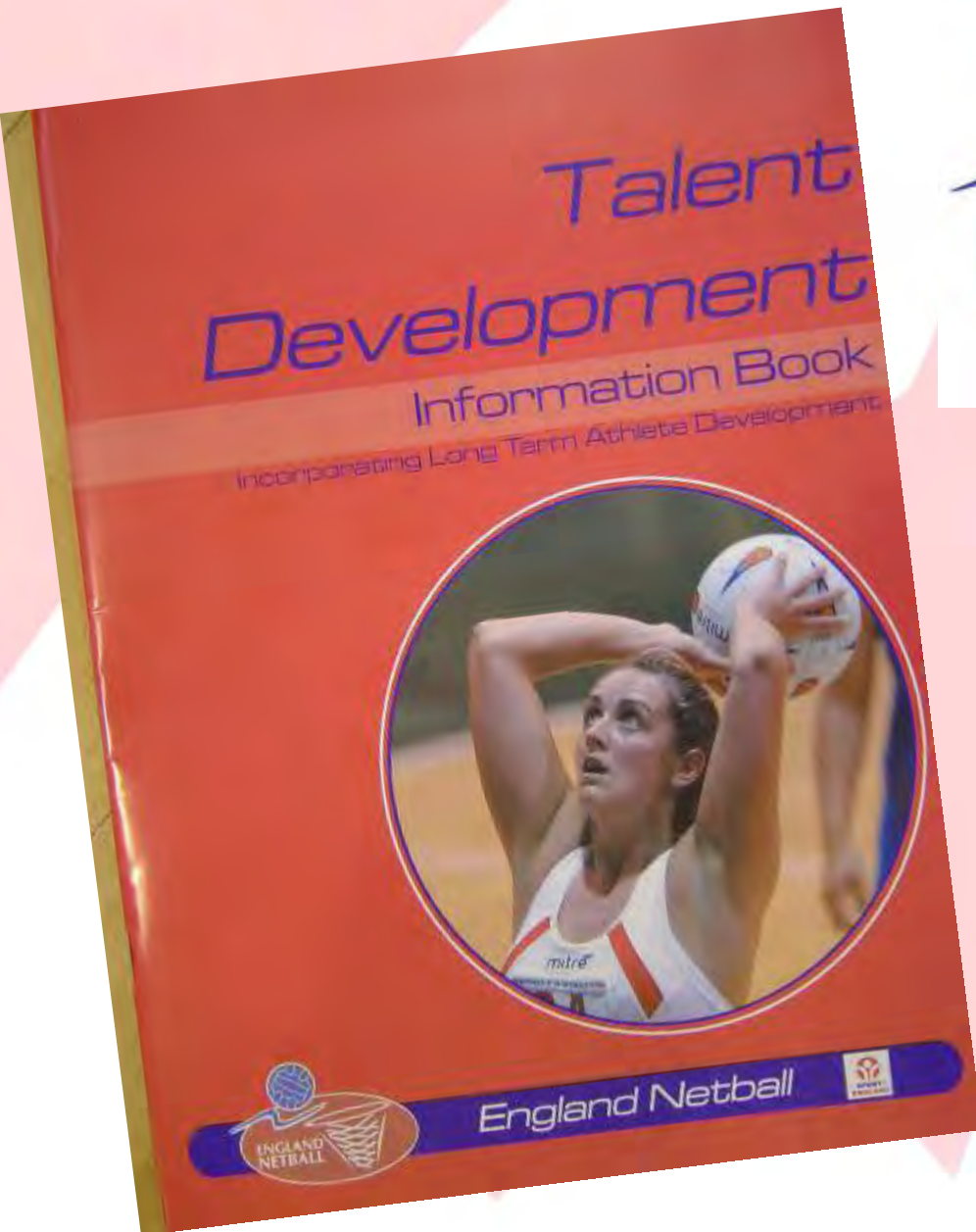
MAKING ENGLAND AN ACTIVE AND
SUCCESSFUL SPORTING NATION:
A VISION FOR 2020

Player Improvement

A consultation paper on the introduction of a Long-term Player Development pathway, and its implications for strengthening the infrastructure of Scottish sport.

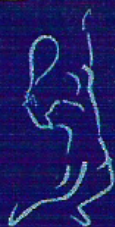


sportscotland





Coach Education



**The LTA Long Term Player
Development Programme**

Version 1



The Lawn Tennis Association

The Swimmer Pathway

LONG TERM ATHLETE DEVELOPMENT



The illustration depicts a vibrant swimming pool environment. In the foreground, a swimmer in a black and white suit is walking along the pool deck. To the left, a group of swimmers in various colored suits are gathered near a set of stairs leading into the water. In the background, a swimmer in a black and white suit is standing on a podium, celebrating a victory. Other swimmers are visible in the pool and on the deck. The scene is set against a backdrop of a swimming pool with a blue sky and a building in the distance.



Endorsed by British Swimming
www.britishswimming.org

The Swimmer Pathway

LONG TERM ATHLETE DEVELOPMENT



The illustration depicts a vibrant swimming pool environment. In the foreground, a swimmer in a black swimsuit is walking on the pool deck. To the left, a group of swimmers is gathered near a set of stairs leading into the water. In the background, a swimmer is celebrating on a three-tiered podium, with two other people standing nearby. The pool water is a deep blue, and the sky is a lighter blue. The overall style is a colorful, cartoonish illustration.



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The Swimmer Pathway

LONG TERM ATHLETE DEVELOPMENT



The illustration depicts a vibrant swimming pool environment. In the foreground, a swimmer in a black swimsuit is walking on the pool deck. To the left, a group of swimmers is gathered near a set of stairs leading into the water. In the background, a swimmer is celebrating on a three-tiered podium, with two other people standing nearby. The pool water is a deep blue, and the sky is a lighter blue. The overall style is a colorful, cartoonish illustration.



Endorsed by British Swimming
www.britishswimming.org

Success is Long Term

Long Term Athlete Development related to the Journey through Swimming



LONG TERM ATHELETE DEVELOPMENT



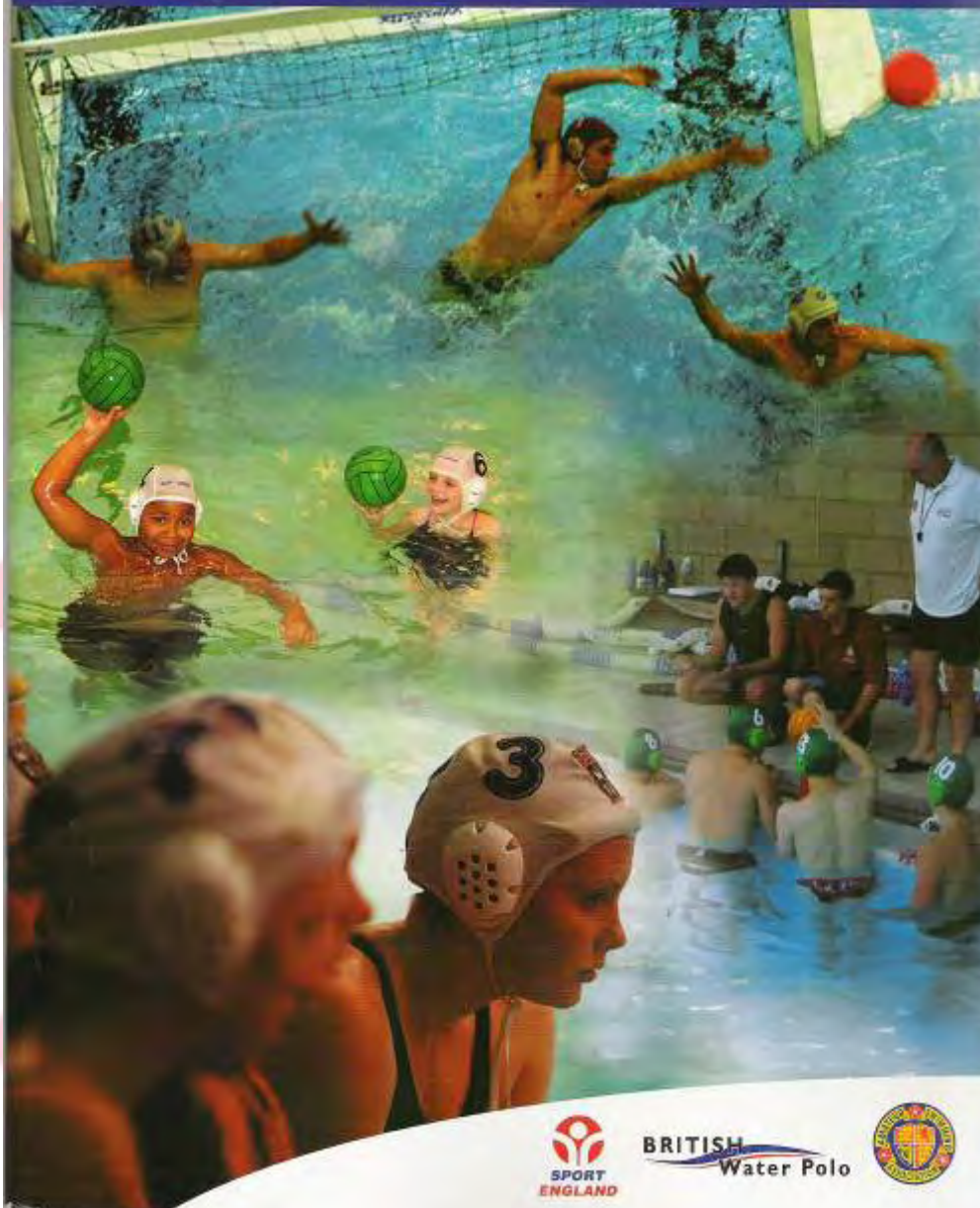
BRITISH
Diving

FINAL DRAFT - APRIL 2005



The Player Pathway

The ASA Long Term Athlete Development (LTAD) framework for Water Polo



BRITISH
Water Polo





BADMINTON

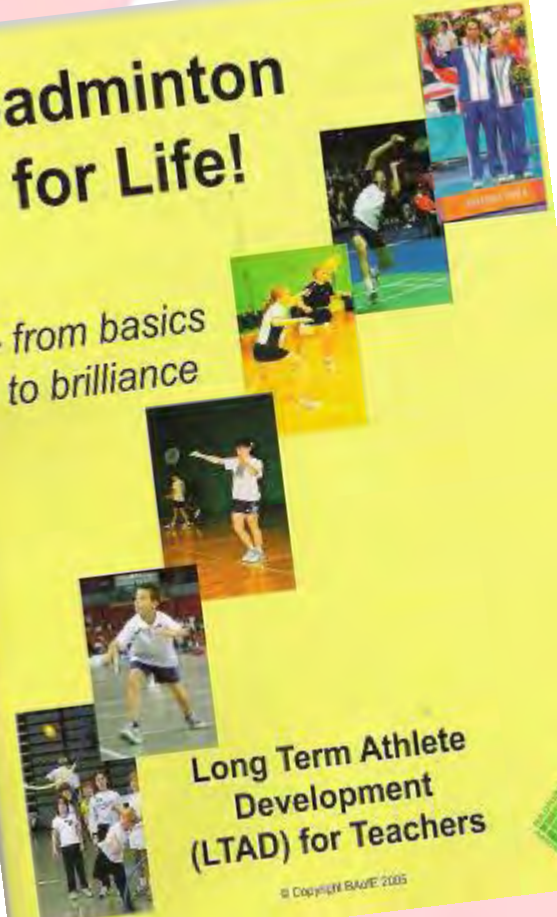
Basics to Brilliance

Long Term Athlete Development (LTAD)



Badminton for Life!

- from basics
to brilliance



Long Term Athlete
Development
(LTAD) for Teachers

© Copyright BAE/E 2005





BCU Long Term Paddler Development Pathway





Planning for Long Term Success

The Long Term Athlete Development Model for Cricket



Guidelines and Principles



www.ecb.co.uk

BRITISH
GYMNASTICS

Fundamental MOVEMENT IDEAS

A Guide to the British Gymnastics Pathway
of Fundamental Movement Ideas



Helping young people to develop firm foundations
for sport and a healthy lifestyle

Caring for our Children's Health & Fitness



PATHWAY OF FUNDAMENTAL MOVEMENT IDEAS

Fundamental Movement Ideas
For Foundation Years

Stage 5 CORE SKILLS
6 - 8 years



Stage 4 FOUNDATION SKILLS
4 - 6 years



Stage 3 INDEPENDENT CHILD
2½ - 4 years



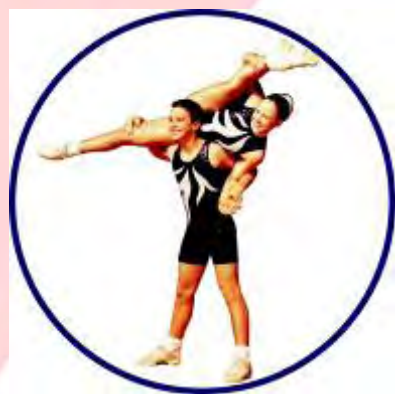
Stage 2 ADULT & CHILD
Walking – 2½ years



Stage 1 FUN 4 BABY
8 weeks - walking



Fundamental Movement Ideas
For Early Years



A SINGLE SYSTEM FOR HOCKEY



Long Term Player Development Women's and Girls Football



An Introductory Guide



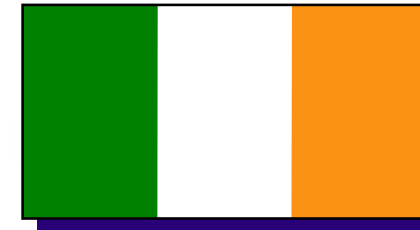


Figure 1. Player Centered Decision Making



FUN to FAME



Learn to Train



Cumann Lúthchleas Gael – Builds Character



Contents

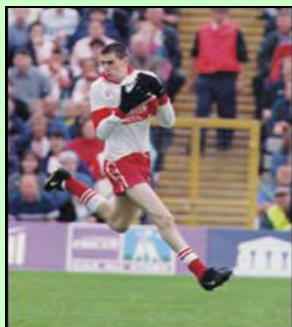


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Istvan Balyi
World leading expert on Long Term Player
Development
who described our Fundamentals manual as
an example of good practice world wide

Introduction to Learn to Train: Long Term Player Development Model: - 8 Steps



Retirement & Retain

COACH
ADMINISTRATOR

Training for Excellence

INTER PROVINCIAL
SENIOR COUNTY AND CLUB
Sports Institute NI

Training to Win

18/19 +
COUNTY and U21 Squads,
F.E. & H.E.

Training To Compete

15/16 To 21/23

Training To Train

Secondary Education /County Development Squads U14/15/16
U.12- 16 Club U.16

Learning to Train

8-12 yrs. Primary School P. 6-7
Sec. Sch. Yr.8
Club U.10/12's

FUNDamentals

6-9 yrs. Primary Schools P 3-5;
First and Second Class& Club U.8's

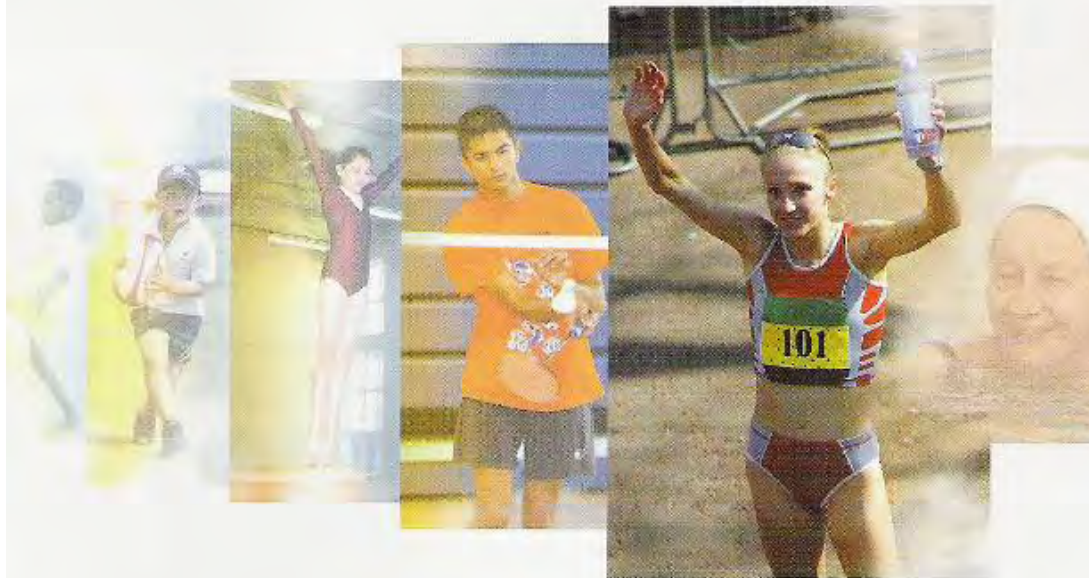
Active Start

0-6 yrs. Pre School P.1/2
Infants and Higher Infants

PREPARING FOR A LIFE IN SPORT

A GUIDE TO GOOD PRACTICE FOR ALL PEOPLE INVOLVED IN SPORT

Administrators • Athletes • Coaches • Officials • Parents • Performers • Players • Teachers



Fundamentals • Learning to Train • Training to Train • Training to Compete • Training to Win • Retainment

LONG-TERM ATHLETE DEVELOPMENT (LTAD)

The Swimmer Pathway

This leaflet shows the 5 stages of The Swimmer Pathway, developed by the ASA to fulfil the potential of all swimmers. Based on the Long Term Athlete Development (LTAD) model, it is about achieving optimal training, competition and recovery throughout a swimmer's career, particularly in relation to the important growth and development years of young people. Where do you fit in?



BEGINNING

Endorsed by British Swimming
www.britishswimming.org



AGES: 16/17 onwards
PRIORITY: WINNING



WHAT TO LEARN WINDOWS OF OPPORTUNITY

PHYSICAL (DEPENDENT ON MATURITY)

- individual programmes for speed, endurance, power, strength, flexibility, core stability

TECHNICAL

- all shots with power and spin as appropriate
- full use of variation and different strokes

TACTICAL

- using strengths
- controlling points
- able to adjust tactics

MENTAL

- fully independent
- positive and disciplined
- self responsible

OTHER SPORTS FOR RECREATION, MAINTENANCE etc.

- hockey, basketball, soccer, swimming etc.

TYPE OF COMPETITION

- club, league, county and national

NUMBER OF TOURNAMENT MATCHES PER YEAR

- at age 16 maximum of 90 individual matches

PLANNING (ANNUAL)

- 3 periods of training with 3 periods of competition
- 30 hours of activity in a training week at age 16, to include 17 hours of tennis

General information

Our primary concern must be to give each young player the best possible chance of reaching their potential at whatever level that might be – club, county, national or even international standard. We know that developing that potential takes a long time – this is why we need the Long Term Player Development Programme. The Space Between 6 AND 16 is a critical time because it sets the base for the adult player.

This leaflet identifies what is important for young players to learn at different ages and stages of their tennis development. It gives the skills that should be learned at the prime learning times – the Windows of Opportunity. We know that using these Windows accelerates learning. We also know that if the Windows are missed, it is then more difficult for players to extend their skill base as they mature, because simple skills are not in place.

In addition, this leaflet identifies:

- other sports which contribute to the skill base
- the most suitable type of competition for each age
- how many tournament matches should be played each year
- how each year should be structured between training and competition

The training programme in this leaflet is based on a sound understanding of the principles of child and tennis development. If we use the information well, every young player stands a chance of reaching his or her potential.

Parents are so important in the development of the young tennis player. We hope that the information given in this leaflet will help your understanding and ability to guide the players of the future.

Anne Pankhurst
LTA Coach Education Director

THE SPACE BETWEEN 6 AND 16 PLAYER DEVELOPMENT



Guidance notes for
parents of young
tennis players between
the ages of 6 and 16



The Lawn Tennis Association

AGES: 5/6 - 9/10

PRIORITY: FUN



WHAT TO LEARN WINDOWS OF OPPORTUNITY

PHYSICAL

- co-ordination
- movement and balance
- throwing, jumping, running

TECHNICAL

- basic shapes forming

TACTICAL

- serving, returning and playing from back of court
- accuracy and consistency

MENTAL

- how to score
- winning and losing
- respecting other players

OTHER SPORTS FOR CO-ORDINATION etc.

- swimming, cycling, dancing
- soccer, netball etc.

TYPE OF COMPETITION

- fun, teams, local, Mini Tennis
- tie breaks and short sets

NUMBER OF TOURNAMENT MATCHES PER YEAR

- at age 8/9 maximum of 20 individual matches

PLANNING (WEEKLY)

- 5 hours of activity at 5/7
- 9 hours of activity at age 9
- structured programme of 2 - 4 tennis sessions

AGES: 9/10 - 12/13

PRIORITY: TRAINING



WHAT TO LEARN WINDOWS OF OPPORTUNITY

PHYSICAL

- complex co-ordination
- speed, strength, flexibility, core stability

TECHNICAL

- basic strokes sound with racket head speed

TACTICAL

- all games situations and doubles

MENTAL

- understanding ability and effort
- more independent
- able to concentrate
- working with others in practice
- coping with winning and losing

OTHER SPORTS FOR CO-ORDINATION etc.

- swimming, cycling, dancing
- soccer, netball, basketball, hockey etc.

TYPE OF COMPETITION

- full sets
- club, league, county and national

NUMBER OF TOURNAMENT MATCHES PER YEAR

- at age 11 maximum of 40 individual matches

PLANNING (ANNUAL)

- 2 periods of training with 2 periods of competition
- 12 hours of activity in a training week at age 11, to include 5 hours of tennis

AGES: 12/13-16/17

PRIORITY: COMPETING



WHAT TO LEARN WINDOWS OF OPPORTUNITY

PHYSICAL (DEPENDING ON MATURITY)

- speed, strength, flexibility, endurance, core stability

TECHNICAL

- developing power and use of spin
- different additional strokes

TACTICAL

- playing offensively
- own games style
- tactics on different surfaces

MENTAL

- able to set goals
- self-disciplined
- concentrates well
- pride in performance

OTHER SPORTS TO HELP SPEED AND ENDURANCE etc.

- swimming, cycling, dancing
- soccer, netball, basketball, hockey etc.

TYPE OF COMPETITION

- club, league, county and national

NUMBER OF TOURNAMENT MATCHES PER YEAR

- at age 14 maximum of 70 individual matches

PLANNING (ANNUAL)

- 3 periods of training with 3 periods of competition
- 24 hours of activity in a training week at age 14, to include 12 hours of tennis

RUGBY LEAGUE FROM CUBS TO LIONS



A brand new, easy-to-use **Rugby League - From Cubs To Lions** DVD containing comprehensive information about player development, working in the community, match officials, coaching and **MUCH, MUCH MORE...**

www.rfl.uk.com | www.superleague.co.uk | www.barla.org.uk



RFU

LONG TERM ATHLETE DEVELOPMENT MODEL





STAGE 1

SPORTING DEVELOPMENT IN THE EARLY YEARS - U7-U9

FUNDAMENTAL MOVEMENT SKILLS

The FUNDamental stage has to be well structured and fun! The emphasis is on fundamental movement skills, and the ABC's of athleticism (Agility, Balance, Co-ordination, Speed), the ABC's of Athletics (running, throwing and jumping) and the KILLS of movement (Kinesthesia, Gliding, Hopping, Striking).

Participation in as many sports as possible is encouraged - if possible three or four times per week.

Where: Primary school PE, rugby clubs, multi-skill clubs.

When: 6-8 years.

Why: To capture the magic.

Physical: General physical literacy - develop the ABC's of movement - Agility, Balance, Co-ordination and Speed. Athleticism in running, jumping and throwing.

Technical: Ball handling, kicking, passing, catching, evading.

Tactical: Fun games developing spatial awareness and working together as a team.

Mental: Introduction to the Laws of the Game, the rules of modified versions and the ethics of playing sport.

Competition: Playing and training to the appropriate rules.

Involvement in sporting activity: Five hours per week across different sporting activities (including PE or games at school).

HANDLING ▶

Catching

High, low and one handed using different shaped balls from a variety of heights and speeds.

Passing

Using a variety of styles (one, two hands or overarm and underarm) types, lengths of pass in different directions.

Basic ball control

Individual ball skills, e.g. picking up, putting down, 'basketball' type ball manipulation, etc.

Co-ordination

Hand to eye co-ordination, e.g. catching tennis ball, etc.

RUNNING ▶

Hopping

Left and right foot.

Leaping

Height and length.

Jumping

Height and length off both standing start and running.

Balance

On both feet

Evasion skills

Swerve, sidestep, spin and change of pace.



KICKING ▶

Basic ball control

Individual ball skills with the feet, e.g. 'football kick ups', dribbling, etc.

CONTACT ▶

Basic body management skills

Including rolling and falling (contact with ground).

Personal conditioning

Including bending, stretching, twisting and turning (basic body movement), own body resistance and contact preparation.

Managing the ball in contact. Contact with other players, including bumping, grappling, pushing and pulling (rude type skills). Introduction to contact, including tackle progressions, ball presentation and basic ruck and maul coaching.

SET PIECES ▶

Introduction of scrums

Allow all players to experience the scrum.

Basic techniques

Body position, feet position, binding and participation/strike.

PREPARING FOR A LIFE IN SPORT

A GUIDE TO GOOD PRACTICE FOR ALL PEOPLE INVOLVED IN

Paddlesport

Paddlers • Coaches • Parents • Clubs • Centres • Administrators • Officials • Teachers



FUNDamentals • Paddlesport Start and Development • Training to Train • Training to Perform
• Training to Excel • Recreation

Long-term Paddler Development

PREPARING FOR A LIFE IN SPORT

A GUIDE TO GOOD PRACTICE FOR ALL PEOPLE INVOLVED IN

Badminton

Administrators • Coaches • Clubs • Leaders • Officials • Parents • Players • Teachers



FUNDamentals • Learning to Play • Training to Train • Training to Compete • Training to Win • Peak Performance

Long-term Athlete Development

l t a d

Long-term Athlete Development

BADMINTON
ENGLAND

Start Love It Now

PREPARING FOR A LIFE IN SPORT

A GUIDE TO GOOD PRACTICE FOR ALL PEOPLE INVOLVED IN

Judo

Administrators • Coaches • Officials • Parents • Performers • Players • Teachers • Volunteers



FUNDamentals • Pre-start • Start • Potential • Performance • Retention

Long-term Player Development

PREPARING FOR A LIFE IN SPORT

A GUIDE TO GOOD PRACTICE FOR ALL PEOPLE INVOLVED IN

Netball

Administrators • Coaches • Leaders • Officials • Parents • Players • Teachers • Volunteers



FUNDamentals • Learning to Train • Training to Train • Training to Compete • Training to Win • Retention

Long-term Athlete Development



An Introduction to

The Long-Term Athlete Development (LTAD) Model for Cricket

A Framework and Blueprint
for Success

"Building a Win Win Sports
System for Cricket"



ENGLAND AND WALES CRICKET BOARD
Developing cricket from playground to Test arena
www.ecbca.co.uk



Au Canada le sport c'est pour la vie

Publié par les Centres canadiens multisports

Canadian
Sport
Centres



Centres
canadiens
multisports



Long-Term Athlete Development

ATHLETES WITH A DISABILITY

A supplement to "Canadian Sport for Life"

No Accidental Champions

Long-Term Athlete Development
for Athletes with a Disability

Published by the
Canadian Sport Centres



Canadian
Sport
Centres

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multisports

Canadian Sport for Life

Wave 1 Vague - completed doc

1. Athletics - Athlétisme
2. Biathlon
3. Canoe - canotage
4. Cycling - cycliste
5. Diving - plongeon
6. Freestyle ski acrobatique
7. Judo
8. Speed Skating - Patinage de vitesse
9. Surf des neiges - Snowboard
10. Synchro
11. Rowing - Aviron
12. Volleyball
13. Wrestling - Lutte

Wave 3 Vague - matrix work

1. Weightlifting - d'haltérophilie
2. Bobsleigh, Skeleton, Luge
3. Cerebral Palsy sports - sports pour paralytiques cérébraux
4. Cross Country - Ski de fond
5. Field Hockey - Hockey sur gazon
6. Figure Skating - Patinage
7. Football
8. Hockey
9. Karate - karaté
10. Squash
11. Water Polo
12. Racquetball
13. Triathlon

Wave 2 Vague - draft done

1. Alpine Ski Alpin (Version # 2)
2. Baseball
3. Basketball
4. Curling
5. Equine - Hippique
6. Golf
7. Gymnastics - Gymnastique
8. Rugby
9. Softball
10. Soccer
11. Swim - Natation
12. Water Ski & Wakeboard - Ski nautique et planche
13. Wheelchair Rugby en fauteuil roulant
14. Yachting

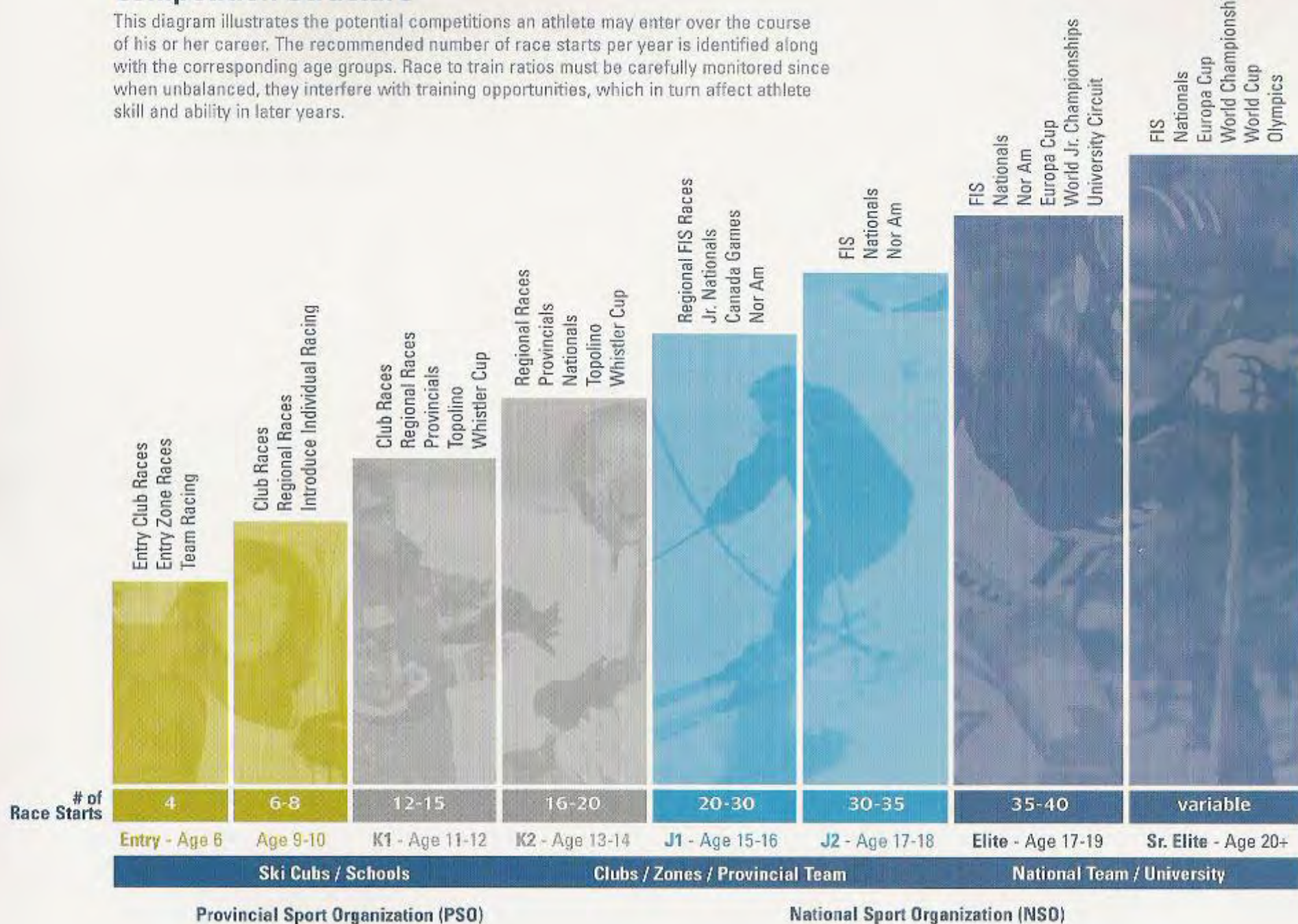
Wave 4a Vague - discussion

1. Archers - des archers
2. Badminton
3. Bowling - des quilles
4. Boxing - Boxe
5. Broomball - Ballon sur glace
6. Fencing - d'escrime
7. Goalball
8. Lacrosse - de crosse
9. Lawn Bowling - Boulingrin
10. Ringette - Ringuette
11. Shooting - de tir
12. Sport Parachute - parachutisme sportif
13. Table Tennis - Tennis de table
14. Taekwondo
15. Tennis

	2006-07	2007-08	2008-09	2009-10	2010-11
NSOs	Wave 1	Wave 2	Wave 3	Wave 4	
PSOs		Wave 1	Wave 2	Wave 3	Wave 4
Physical Literacy	Round Table Supplement development	Supplement translation/ printing Develop partnerships	Adapt Supplement with Partners	PL Incorporated Stakeholder plans	
Resource Develop.	Documents(4) AWAD Brochure Partners adapt material	Documents(6) AWID Supplement Website enrichment	Documents(6) Second Ed. CS4L DVD production	Additional Materials if Required	
Other	LTAD Presenter Network	Expand	Support		

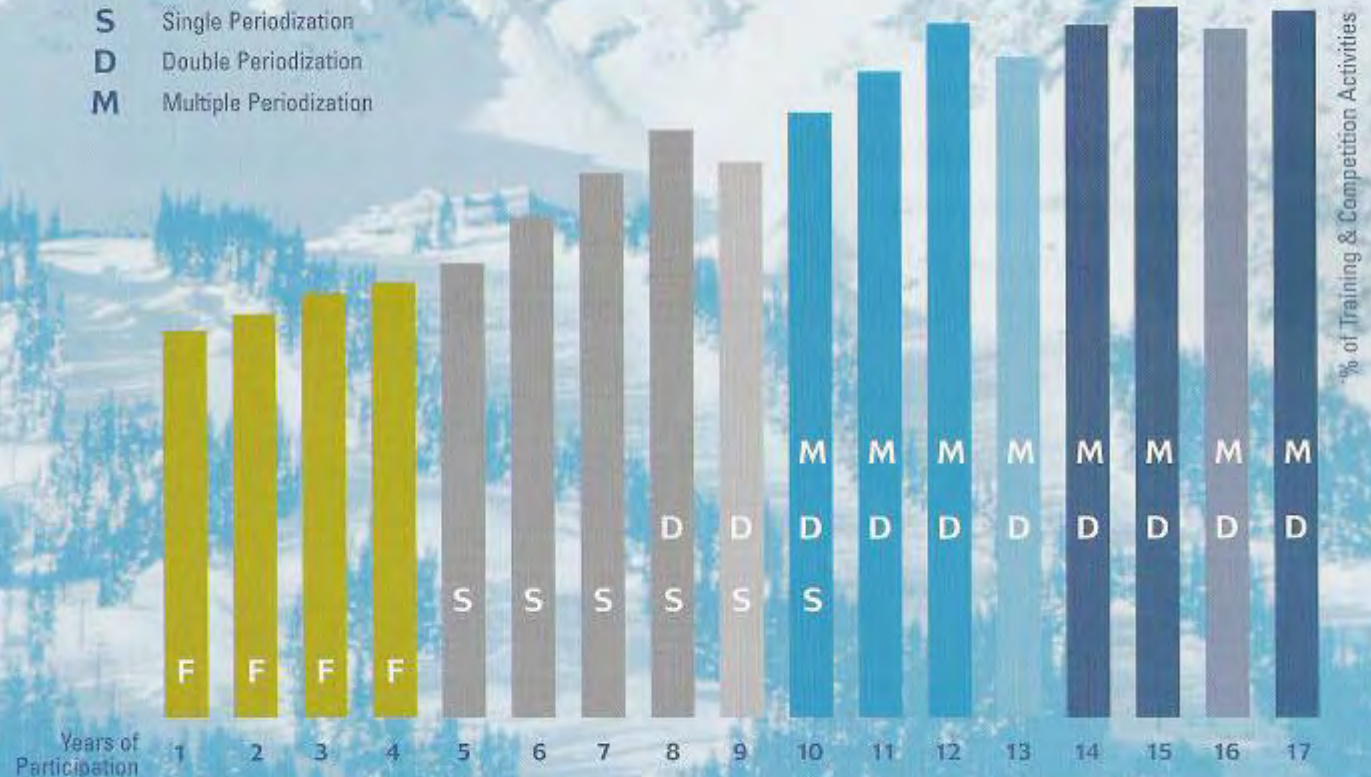
Competition Structure

This diagram illustrates the potential competitions an athlete may enter over the course of his or her career. The recommended number of race starts per year is identified along with the corresponding age groups. Race to train ratios must be carefully monitored since when unbalanced, they interfere with training opportunities, which in turn affect athlete skill and ability in later years.

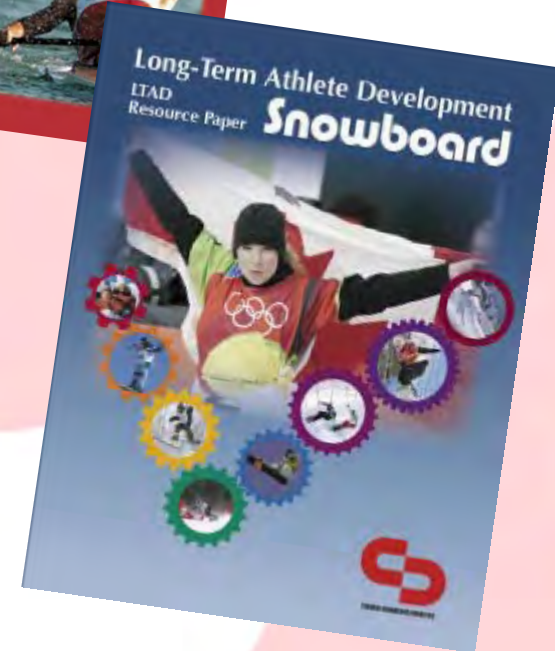


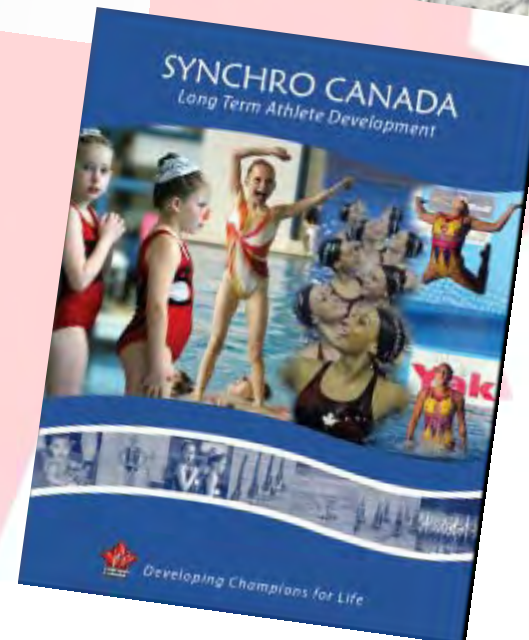
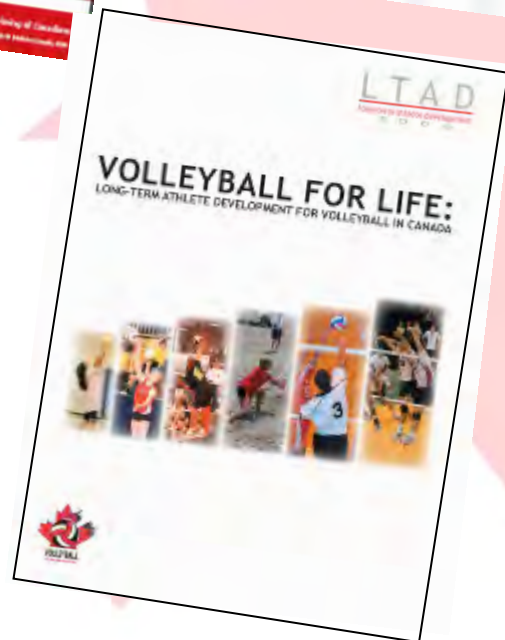
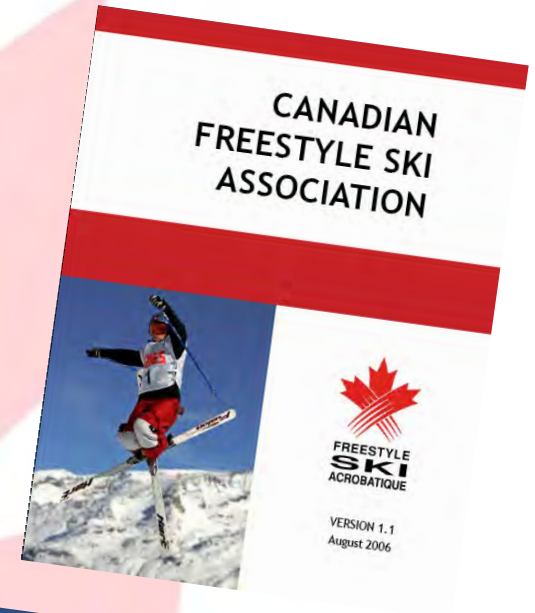


F FUNDamental - No Periodization
S Single Periodization
D Double Periodization
M Multiple Periodization



Organizational and Developmental Structure

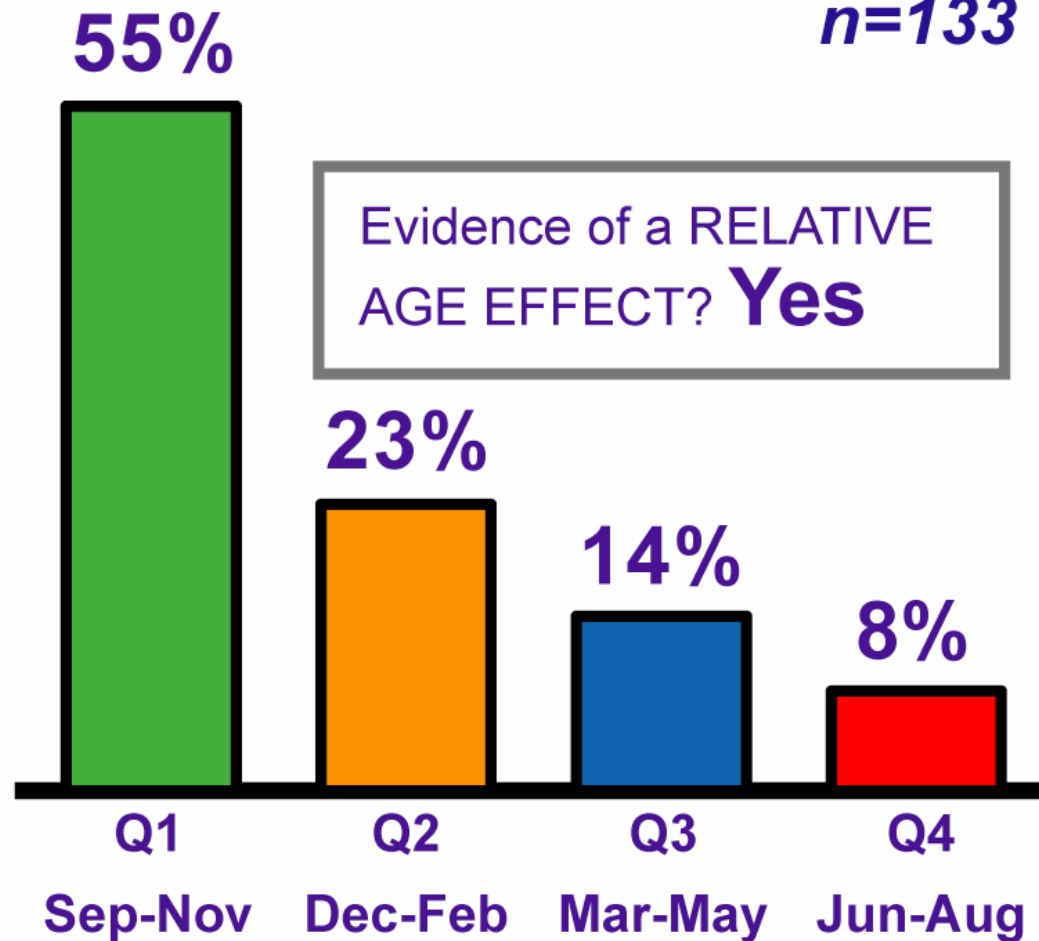




- Chronological age
- Relative age
- Biological age
- Skeletal age
- Developmental age
- Training age
- Sport-specific training age

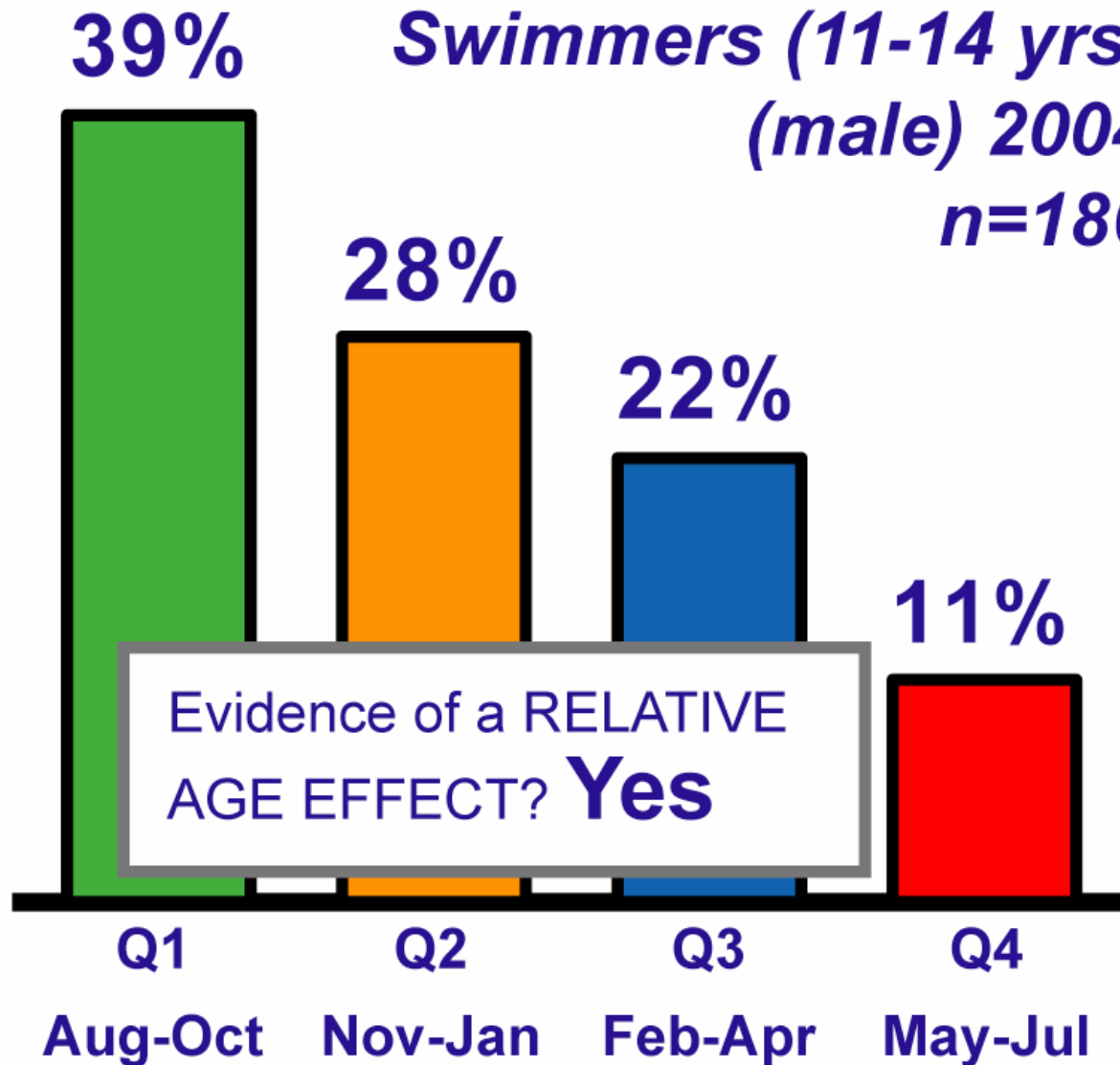


**U15 Finalists English Schools
Athletics (male)
2002
n=133**



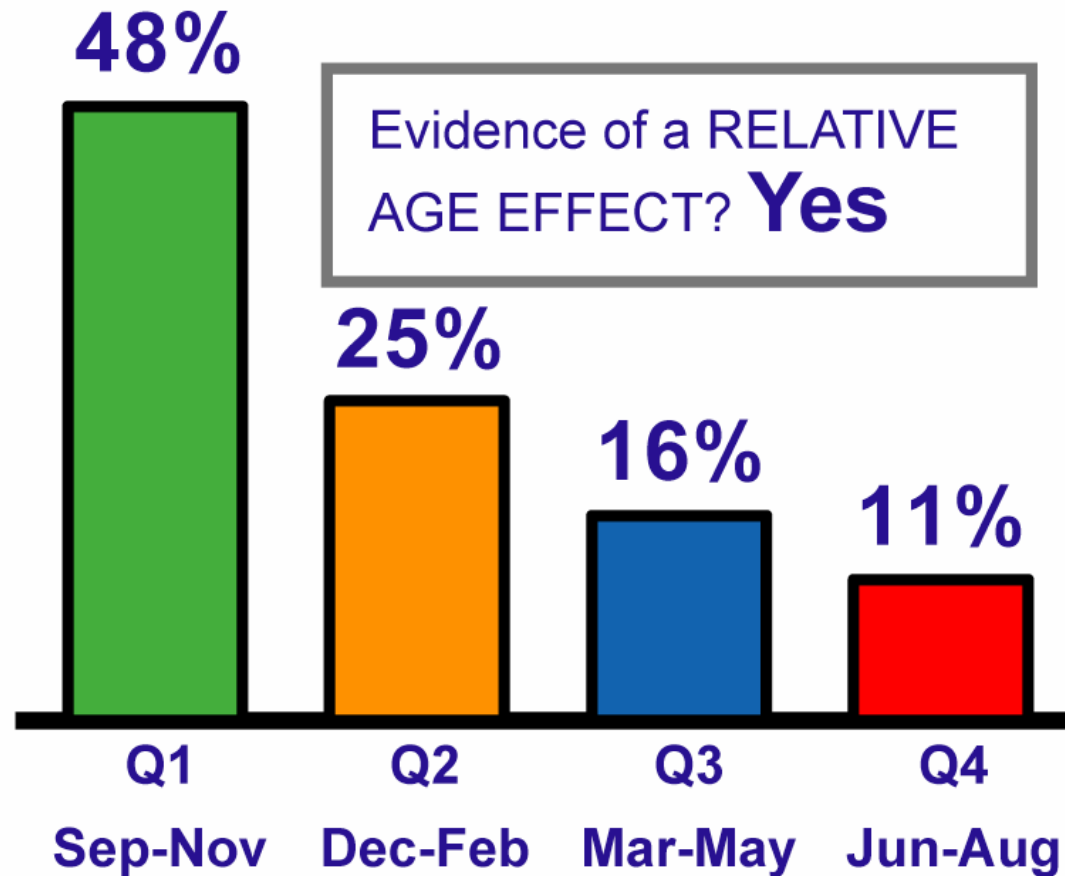
Sources: <http://www.esaa.net>; Whittingham & Matthews
(Eds.) British Athletics Statistical Review 1999-2005

**ASA Age Championship
Swimmers (11-14 yrs)
(male) 2004
 $n=186$**



Source: Amateur Swimming Association

**English Academy Footballers
(male) 2002 / 2004
 $n=1765$**



Source: M. Hulse, The Football Association
Medical and Exercise Science Department

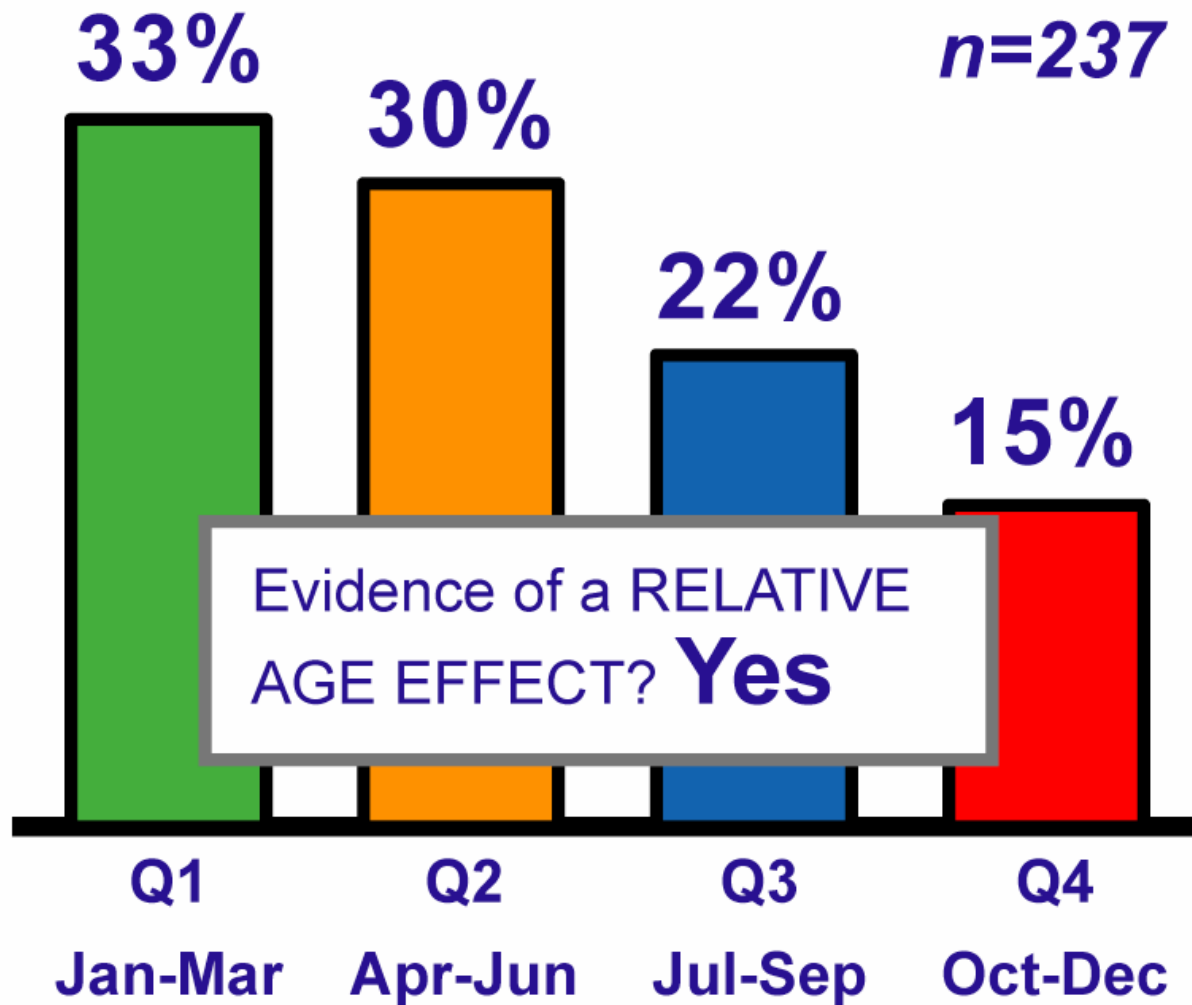
Boy 2 is identical to Boy 1 except for being 11 months younger.

Entry to Year 9 Secondary School
1st September 2004

Selected
for School
Football
Team?

	Born	Age	Height	Weight	
'Boy 1'	1st September 1990	14 years 0 month	 162.4 cm	 49.2 kg	Yes
'Boy 2'	1st August 1991	13 years 1 month	 155.4 cm	 43.4 kg	No
Difference between boys at time indicated.		11 months	7.0 cm	5.7 kg	

***Elite Junior Tennis Players
(male) 2003
n=237***



Source: Edgar and O'Donoghue, 2005

Figure 1.

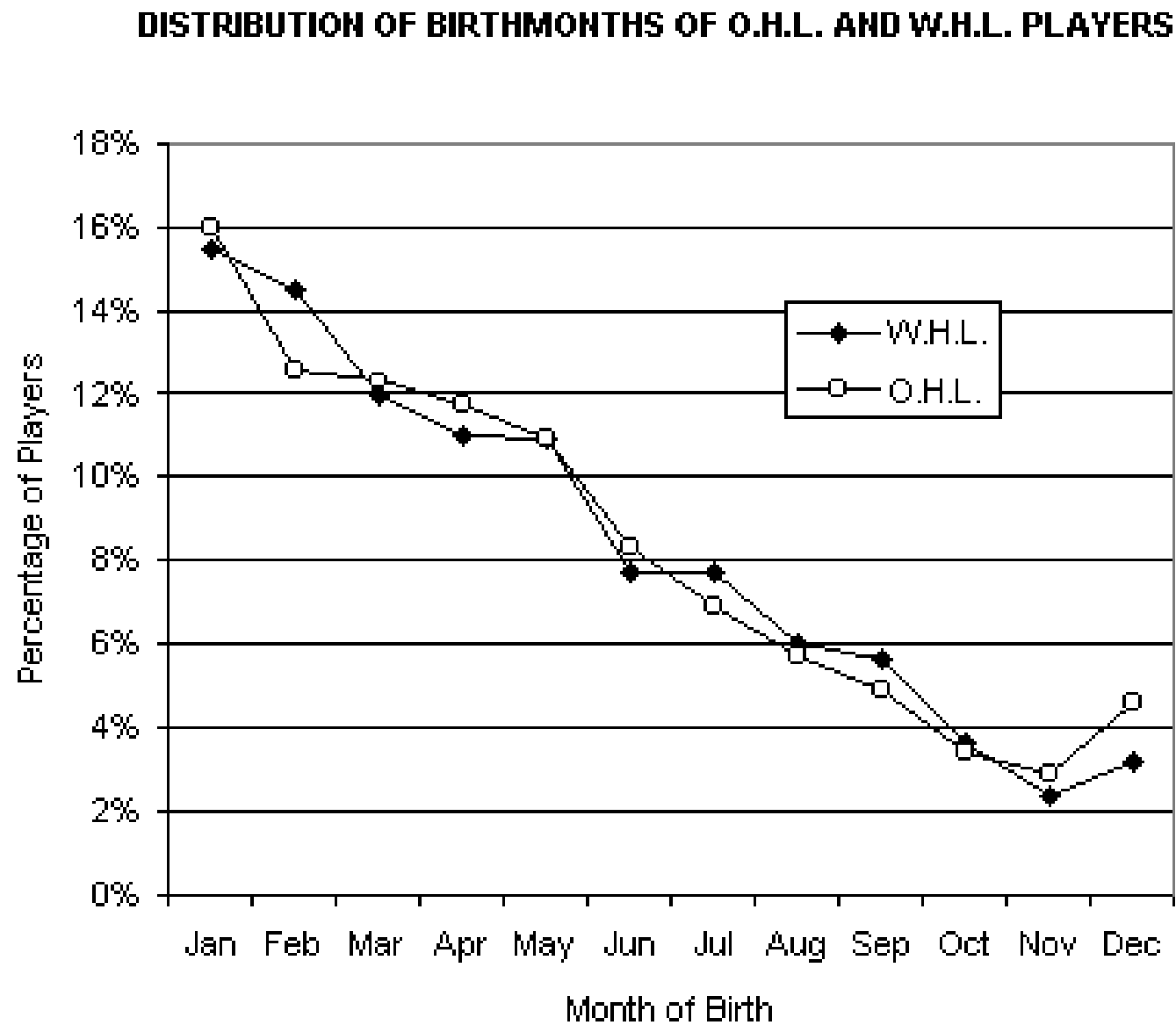
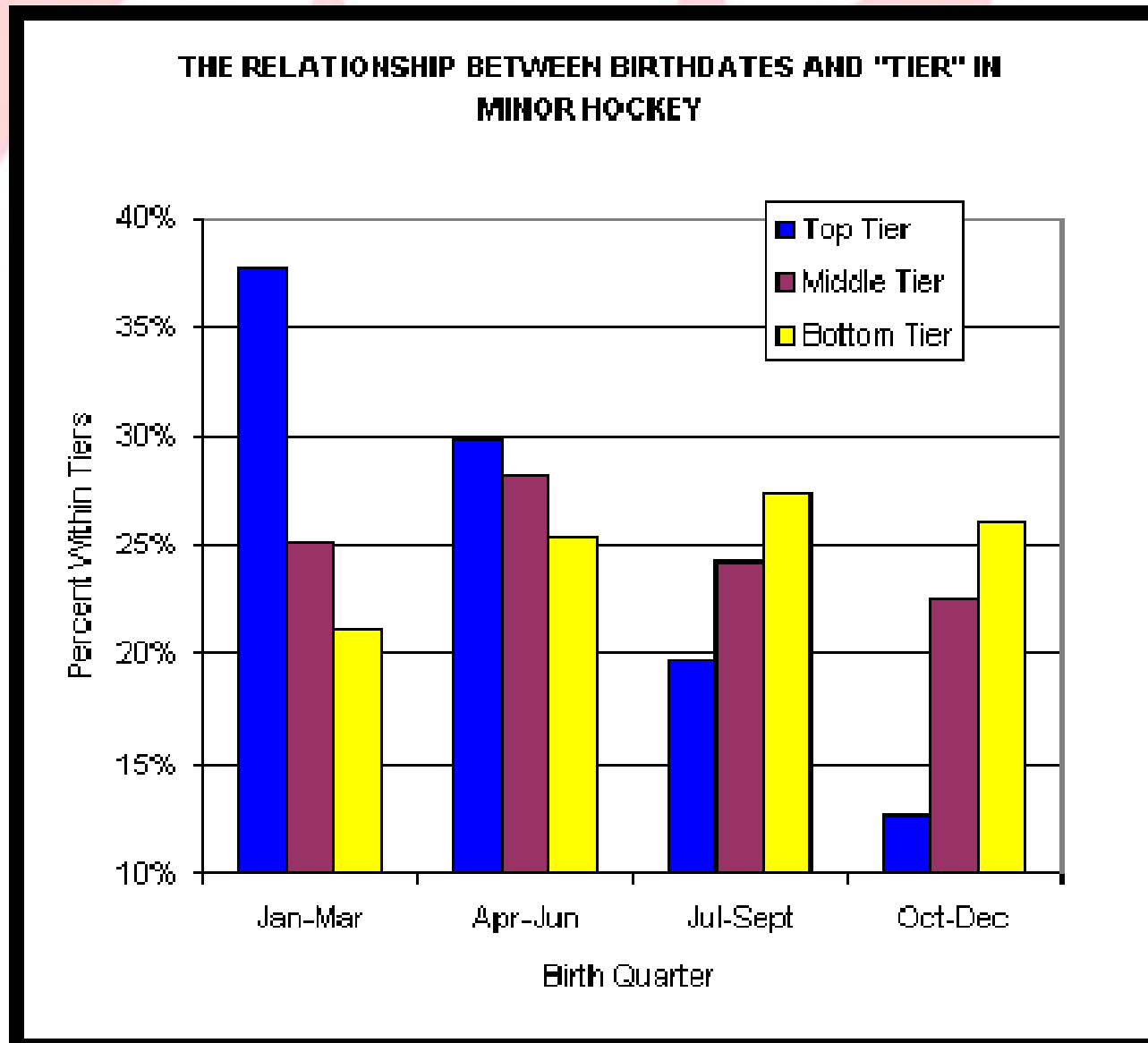
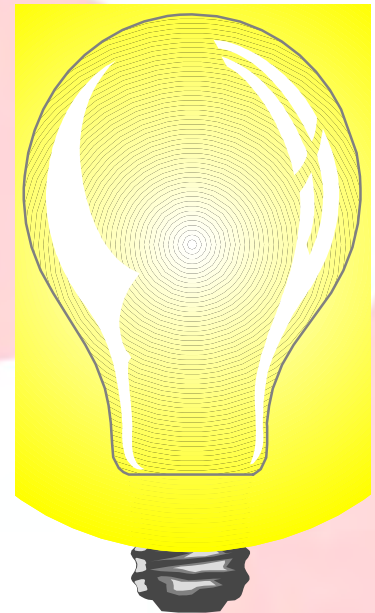


Figure 2.



- **If one year can have such an impact, what about 2, or 3 or 4 or 5 years of difference???**
- **Athletes can be 4 - 5 years apart in developmental age!**



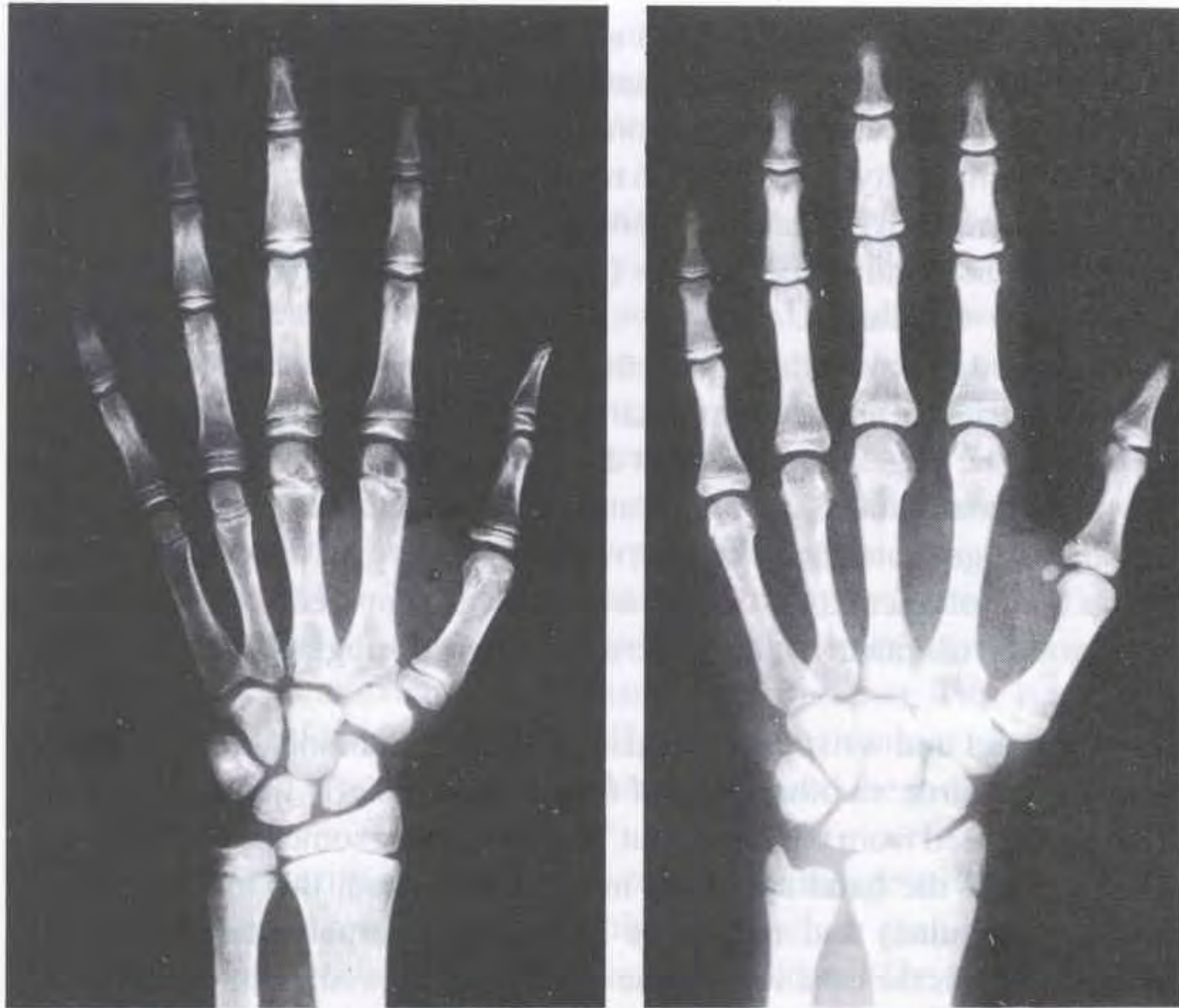


Figure 29 Radiographs of two boys both aged 14.0 years: (left) bone age 12.0 'years'; (right) bone age 16.0 'years'

How old is a 14 year
old ?



Irish boxers – 14 years old 60kg., 40 kg., and 50 kg.



1992



E W, K V, S S, C D, S D-L



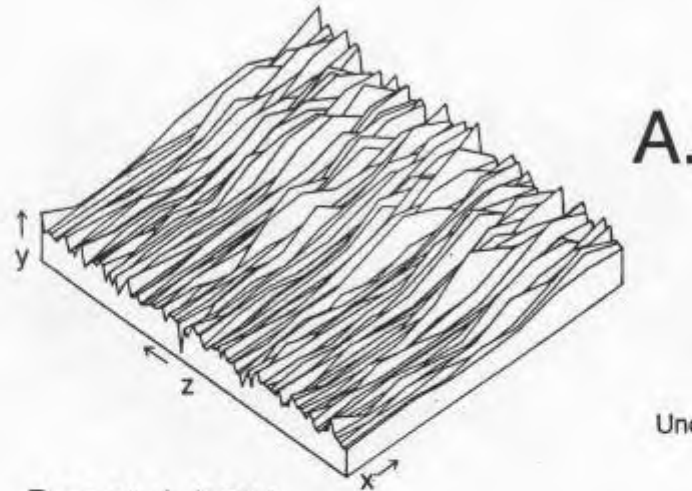
1993

P P L,
C M,
T L,
B R

STANDING HEIGHT VELOCITY

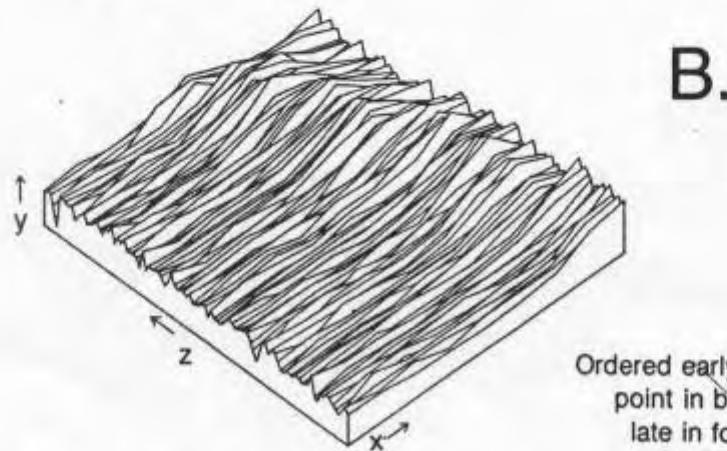
SASKATCHEWAN BOYS

Age 7 to 16 years on X axis, cm per year on Y axis, and subjects on Z axis.



Unordered.

Ross et al. (1977)



Ordered early peak velocity
point in background,
late in foreground.

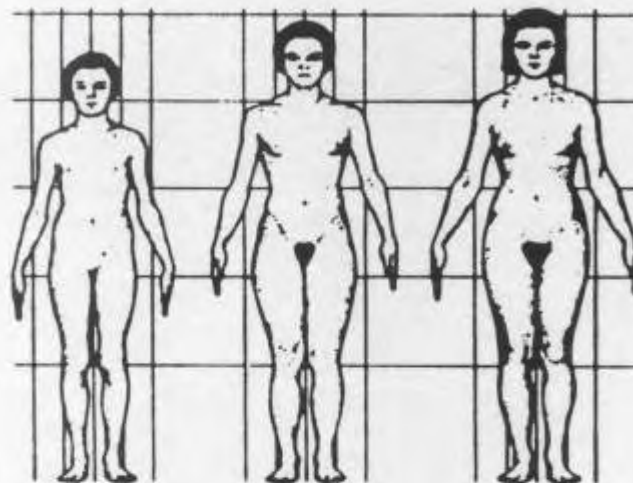
Fig. 6.21 Tri-dimensional graph of 100 boys from Saskatchewan Growth Study. (Leahy et al., 1980)

Figure 1

Age: 12.75 Years

12.75 Years

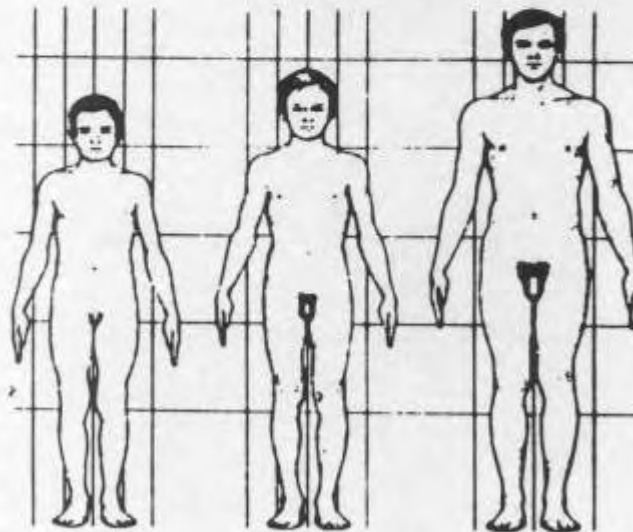
12.75 Years



Pre-puberty
Late maturer

Mid-puberty
"Average" maturer

Post-puberty
Early maturer



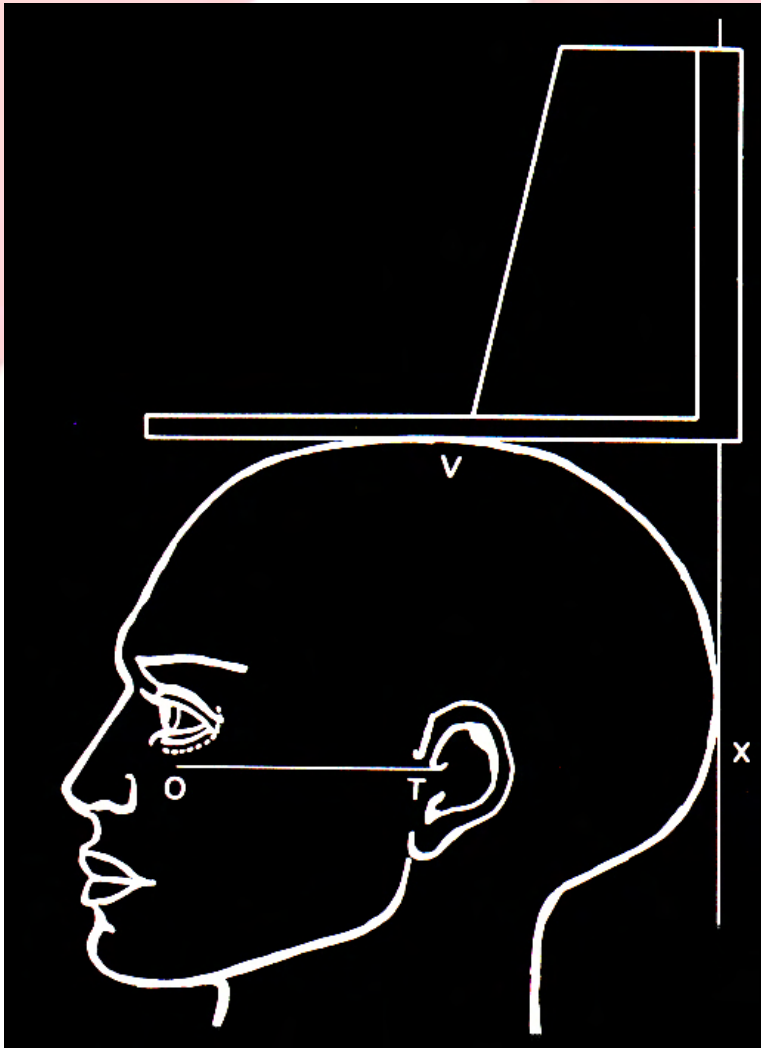
Age: 14.75 Years

14.75 Years

14.75 Years

From "Growing Up" by J.M. Tanner, Copyright © 1973 by
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Measuring and interpreting PHV (How to PHV ?)



Adolescent Growth Spurt

PEAK HEIGHT VELOCITY (PHV)



Croissance soudaine a la puberté

Pic de croissance rapide soudaine

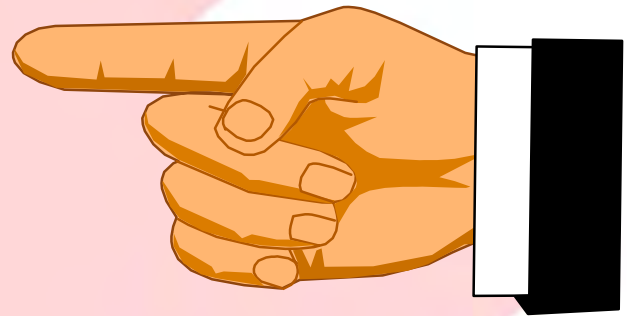
•Viru et.al. Age periods of accelerated improvements of muscle strength, power, speed and endurance in the age intervals of 6 – 18 years.

- 31 studies and 11 reviews**
- Cross sectional studies, number of subjects 83 to 21175**
- Longitudinal studies 65 to 90**
- Age range 6 to 18 years**
- Clearly defined endurance, strength and speed windows**

- 
- Rushall, 1998
 - Viru, 1995
 - Viru et al, 1998
 - Vornotsov, 2003

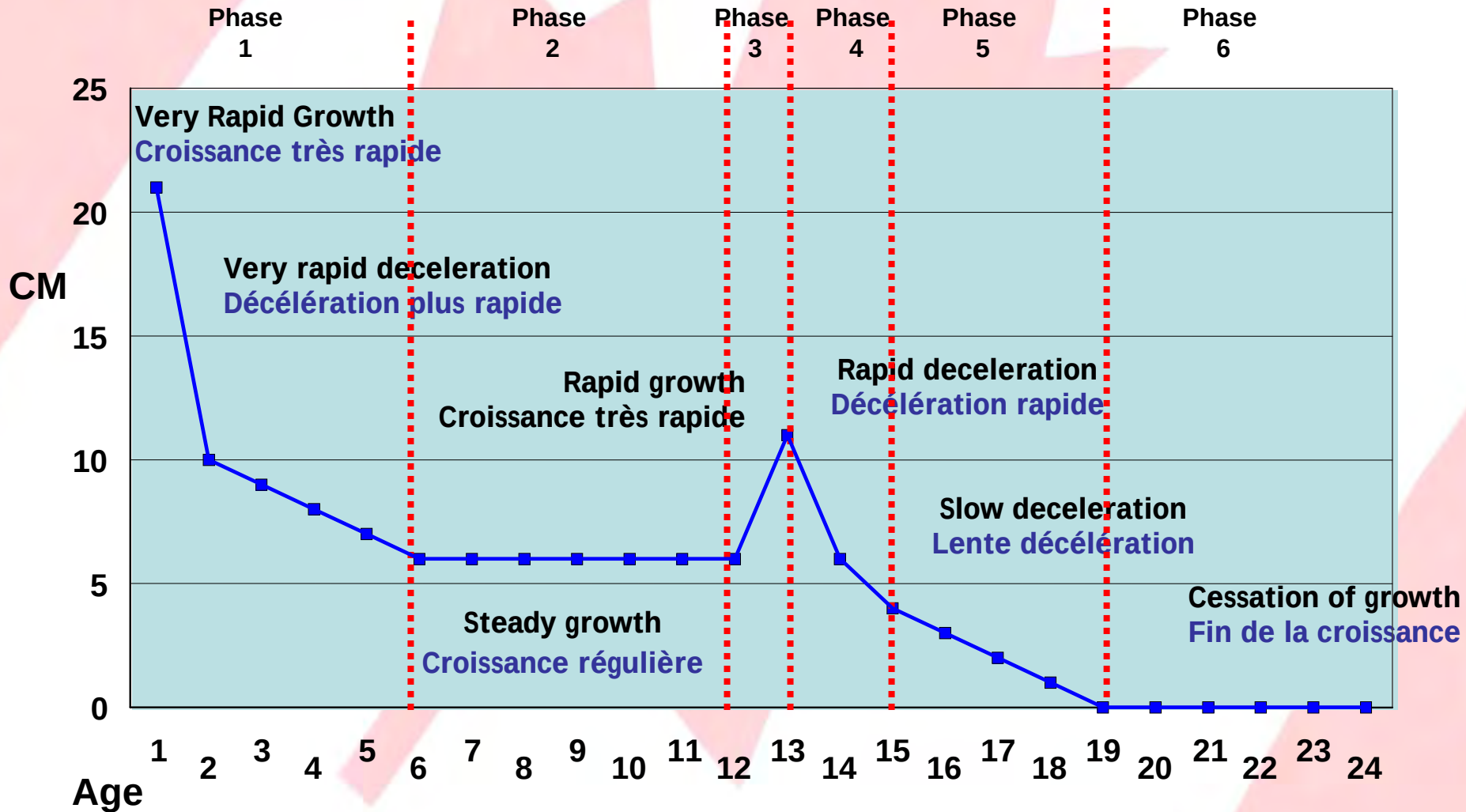
Trainability

- **Based on chronological age:**
 - Skill
 - Speed
 - Suppleness
- **Based on developmental age**
 - Stamina
 - Strength
- **Biological markers**
 - onset of PHV
 - PHV
 - onset of menarche



“Reactive Periodization”

Phases of Measurement



Developmental age - PHV

- **How to measure ?**
- **What to measure ?**
- **When to measure ?**
- **What tools to use for the measurements ?**
- **Who should measure ?**
- **How to administer measurement data ?**



COACHING FOR LONG-TERM ATHLETE DEVELOPMENT: TO IMPROVE PARTICIPATION AND PERFORMANCE IN SPORT



IAN STAFFORD



- **Coachwise -
sportscoach UK**

- **“How to PHV ?”**

**Chapter 1
Introduction & LTAD**

Technique of Measurement

Technique de mesure

- **Chapter 2. Measurement of PHV to indicate growth and maturation (Dr. Craig Williams, University of Exeter)**
 - Growth and Development Section (What is?)
 - Technical and Protocol Section (How to?)

Programme Planning

- **Chapter 3. Training, Competition and Recovery Programme Prescription for the Developmental Athlete. (Istvan Balyi and Graham Ross)**
 - Trainability and Adaptation
 - Developmental age
 - How to use collected data in programme prescription
 - How to design an annual training, competition and recovery programme – a step-by-step protocol



Coaching Young Performers

10 S's

1. **Skill** (technical – tactical – decision making)
2. **Speed**
3. **Suppleness**
4. **Stamina**
5. **Strength**
6. **Structure / Stature**
7. **Sychology**
8. **Sustenance**
9. **Schooling**
10. **Socio-Cultural**

1. **Habiletés** (techniques – tactiques – décisionnelles)
2. **Vitesse**
3. **Souplesse**
4. **Endurance**
5. **Force**
6. **Structure / Stature**
7. **Psychologie**
8. **Subsistance**
9. **Études**
10. **Aspect socioculturel**

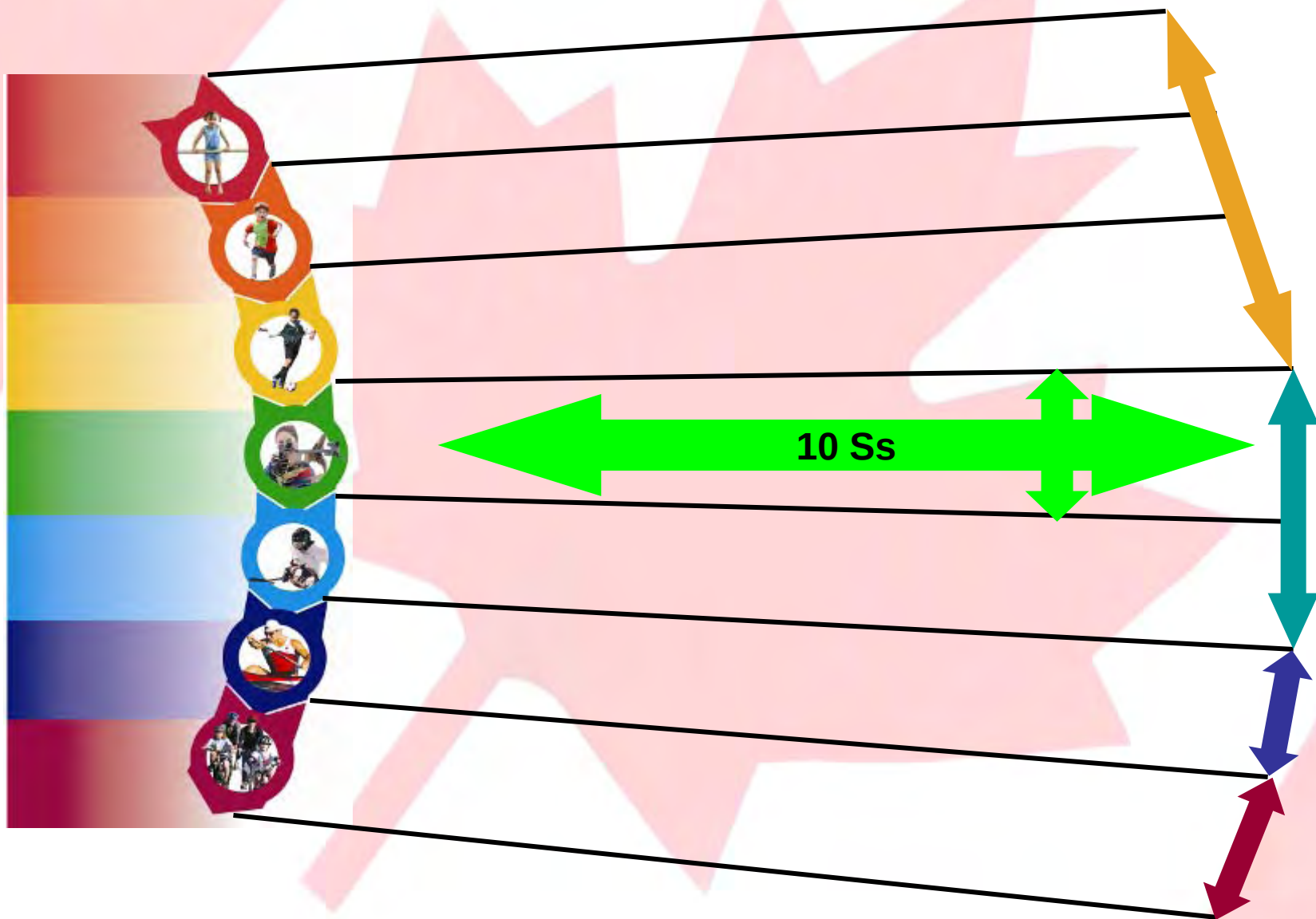
Periodization

- **Horizontal and vertical integration of the 10 S's**
- **Periodisation is the tool to do it!**

Seven Stages of Long-Term Athlete Development

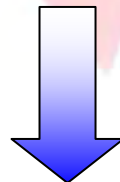
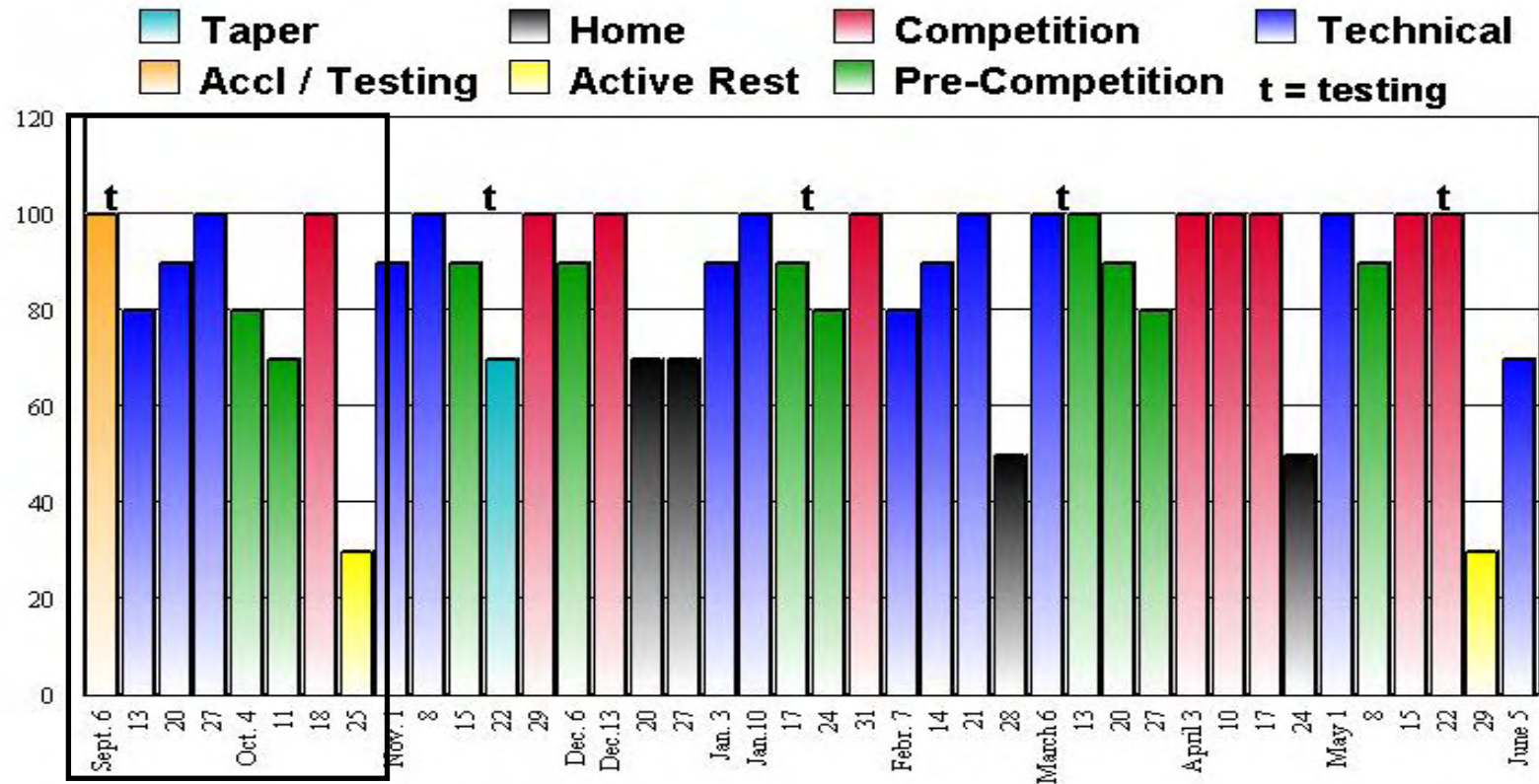
Active Start
FUNDamental
Learning to Train
Training to Train
Training to Compete
Training to Win
Active for Life





Bollettieri Tennis Academy

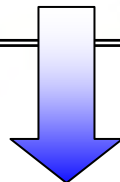
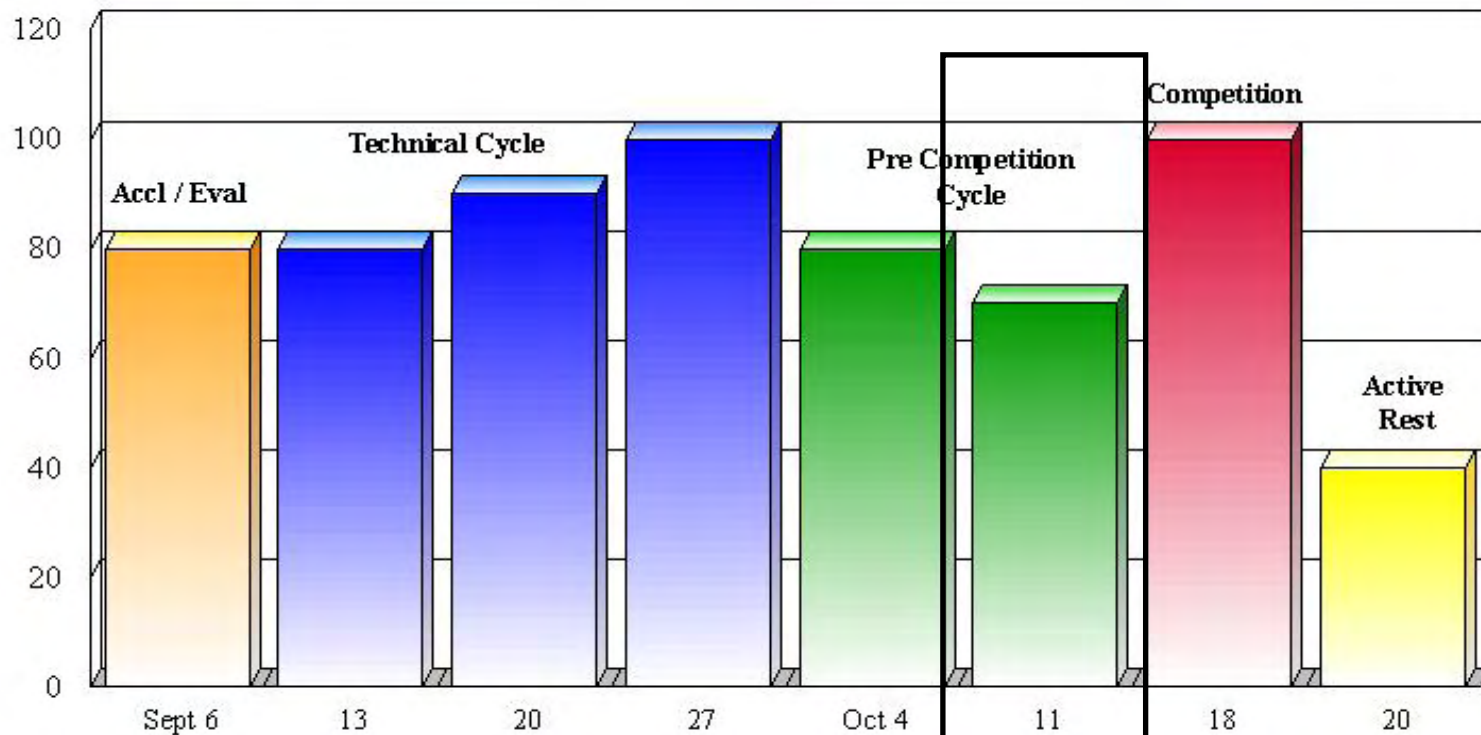
Annual Plan



Bollettieri Tennis Academy

Annual Plan - Phase 1

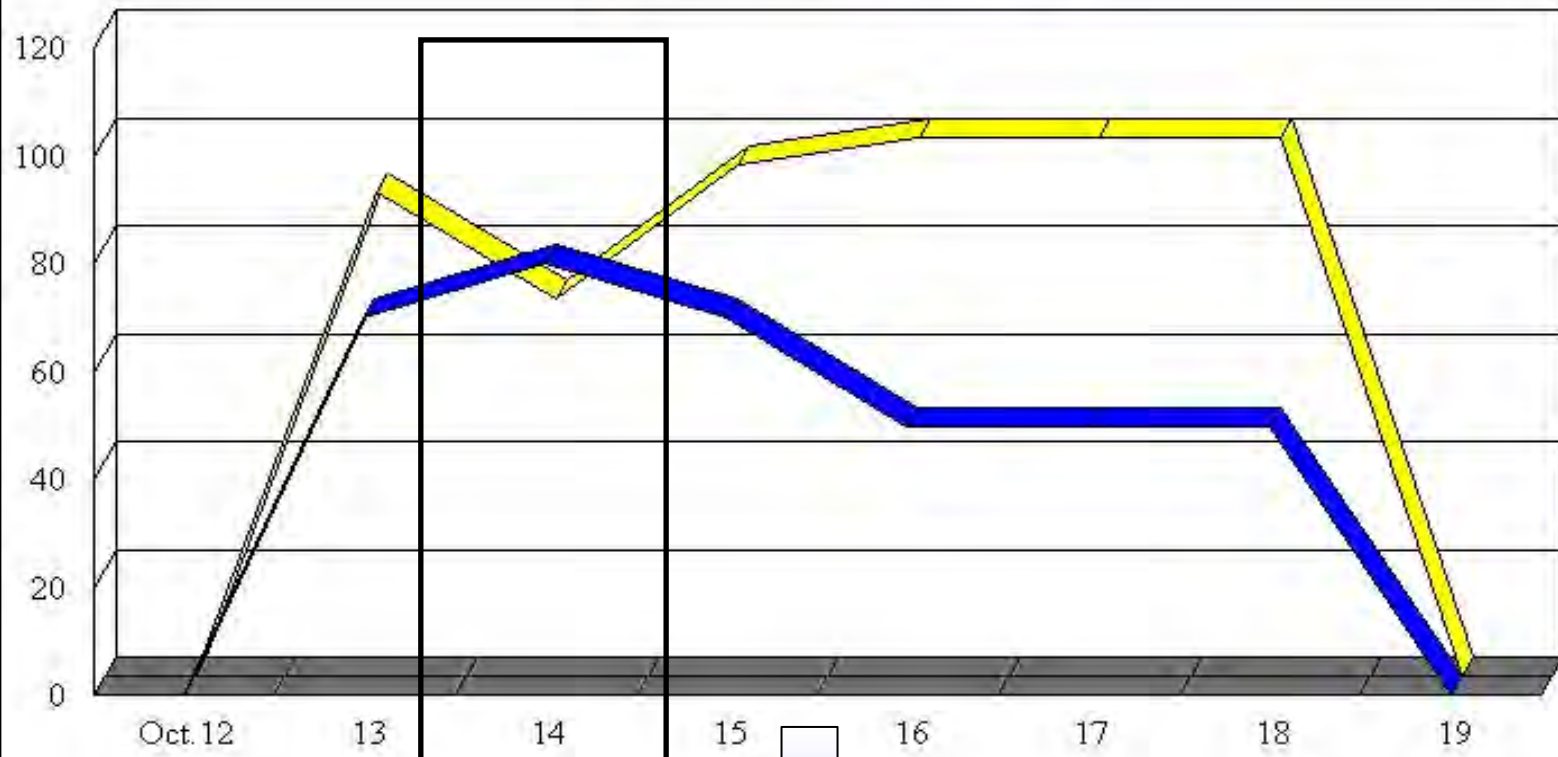
Accl / Testing Competition Pre-Competition Technical
Active Rest



Bollettieri Tennis Academy

Micro Cycle 6 - Pre-Competition Cycle

■ Volume ■ Intensity



Daily Cycle- 14th October 1999

Time	Rotation	Court
1:30-3:00pm	Drilling	14
3:00 -4:30pm	IPI	Dome
3:00 – 3:45pm	Mental Conditioning. (M/T)*	
4:30-6:00pm	Match-play	21

Note: *On Monday's each student will have 45 minutes of mental conditioning. On Thursday a mental conditioning staff member observes each student on the courts.

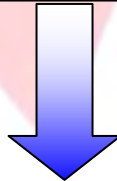


Rotation 1 – Drilling

Time: 1:30-3:00pm

Objective: Match Simulation Drills

- | | |
|------------------------------|---------------|
| 1. W/Up: Mini Tennis | 10 min |
| 2. Defend B/line X-crt | 15 min |
| 3. Attack B/line D-T-L | 15 min |
| 4. Control Center & Close In | 15 min |
| 5. Change of Direction | 15 min |
| 6. Depth & Consistency | 10 min |
| 7. W/Dn: Stretch & Hydrate | <u>10 min</u> |
| Total 90 min | |

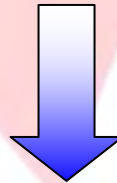


Rotation 2 – IPI

Time: 3:00 – 4:30

Objective: Download before competition

1. Warm-up	10 min
2. Agility	10 min
3. Balance	10 min
4. Speed	10 min
5. Rest	10 min
6. Strength	10 min
7. Power	10 min
8. Pre-habilitation	10 min
9. Regeneration	<u>10 min</u>
Total 90 min	



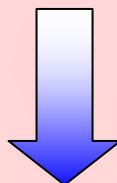
Rotation 3 – Mental Conditioning

Time: 3:00 – 4:00 pm

Objective: Increase mental toughness

- .Testing Evaluation
- .Goal Setting
- .Quality Practice = Quality Performance
- .Attitude / Concentration / Effort
- .Developing Rituals
- .Self Awareness

Note: These are some of the topics that are covered throughout the year.



Rotation 4 – Match Play

Time: 4:30 – 6:00

Objective: Practice Set

6. Structure / Stature

- **Structure & stature before maturation**
 - Trainability (3 windows of optimal trainability)
 - **Stature during maturation**
 - Developmental age
 - Sliding scales of trainability
 - **Structure after maturation**
 - Diagnostics - strength and weaknesses
- **Structure & stature avant la maturation**
 - Capacité d'entraînement-récupération Pendant
 - **Structure avant la maturation**
 - âge de développement
 - **après la maturation**
 - Diagnostic - stimuli périodisés

Long-Term Athlete Development

Playground to Podium. Planning for the sporting excellence and well-being of Canadians.

This growth chart supports a 7-stage Canadian model of Long-Term Athlete Development (LTAD), a training, competition, and recovery program based on developmental age — the maturation level of an individual — rather than chronological age. It is athlete centred, coach driven, and administration, sport science, and sponsor supported. Athletes who progress through LTAD experience training and competition in programs that consider their biological and training ages in creating periodized plans specific to their development needs. For more information on the Canadian LTAD please visit www.LTAD.ca



Nulla illum et qui wisi nonummy sit, dolore, delenit in ad at, vel wisi. Tincidunt dolor nisi laoreet odio, luptatum. Nulla esse elit eu vel quis, nostrud accumsan dolor eros nostrud vulputate ea. Aliquip in nisi iusto illum. Dolor at feugiat, ullamcorper suscipit dolor adipiscing iusto, suscipit. Commodore feugiat wisi molestie ex qui feugiat molestie, ut. Suscipit ut luptatum vulputate, diam. Amet luptatum lobortis ipsum eros euismod. Augue tation, consequat illum minim wisi duis, duis. Nulla tincidunt ullamcorper duis. Vel,

Standing Height



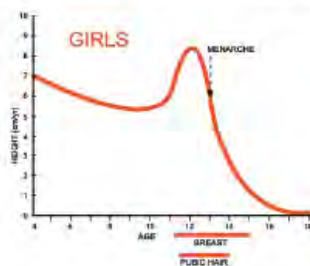
Sitting Height



Arm Span

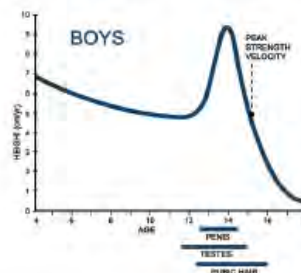


Maturity Events in Girls (Modified after Ross et al. 1977)



PHV in girls occurs at about 12 years of age. Usually the first physical sign of adolescence is breast budding, which occurs slightly after the

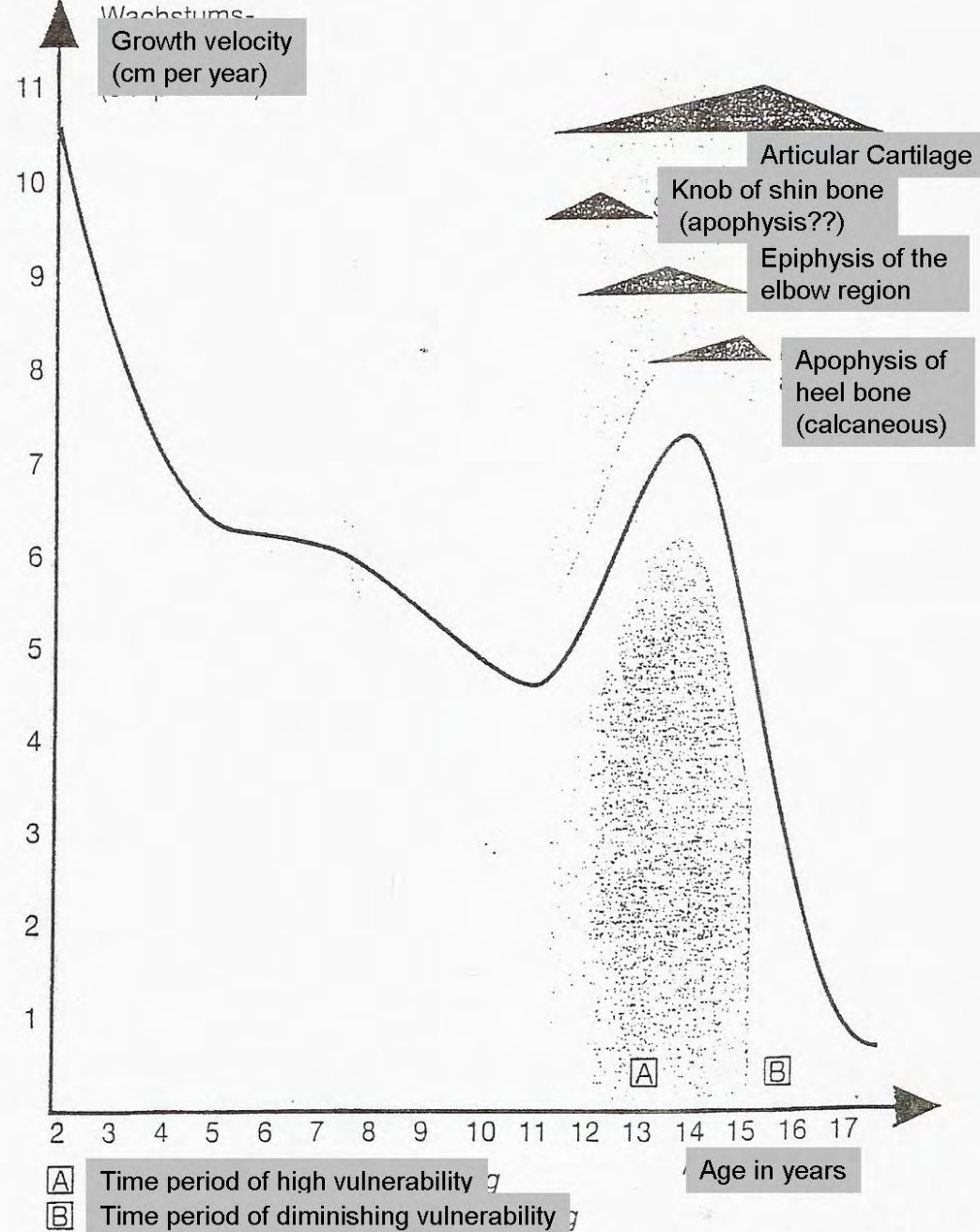
Maturity Events in Boys (Modified after Ross et al. 1977)



PHV in boys is more intense than in girls and on average occurs about 2 years later. Growth of the testes, pubic hair, and penis are related to the maturation process. Peak

• Vulnerability

(Stein, 2002)

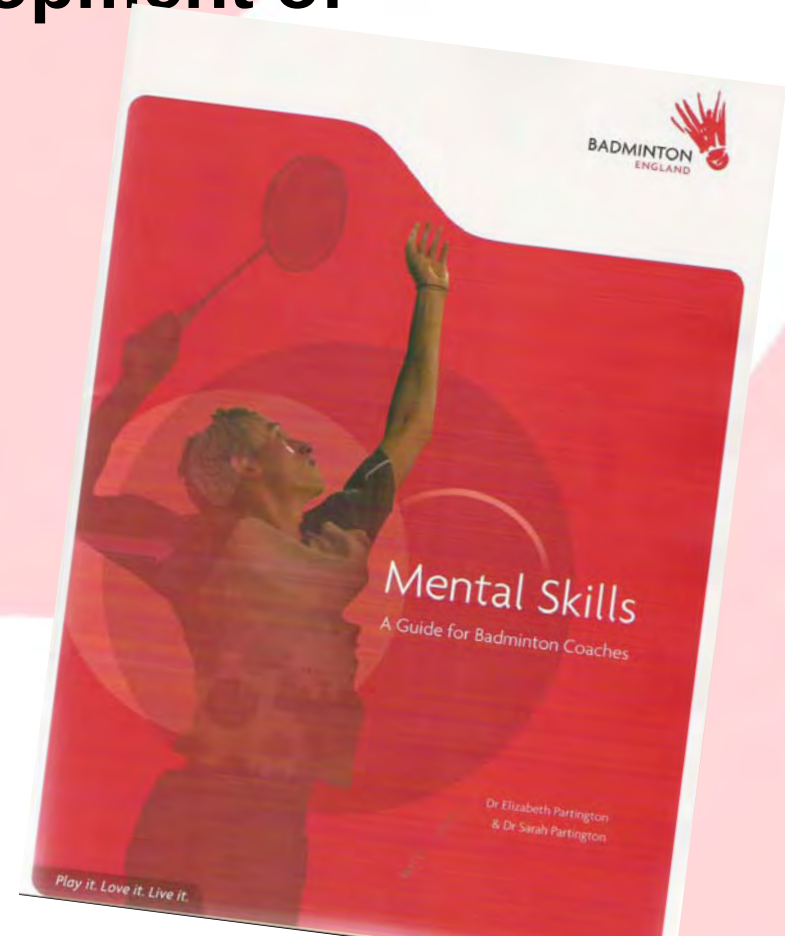


Specific periods of vulnerability for the developing bones of areas of high load for girls; for boys, this period is approx. 2 years later

7. Sychology - Psychologie

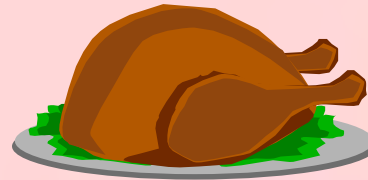
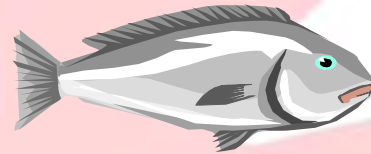
The foundation is the cognitive, mental and emotional development of the athlete... (readiness!)

- Preparation for all the stages of LTAD



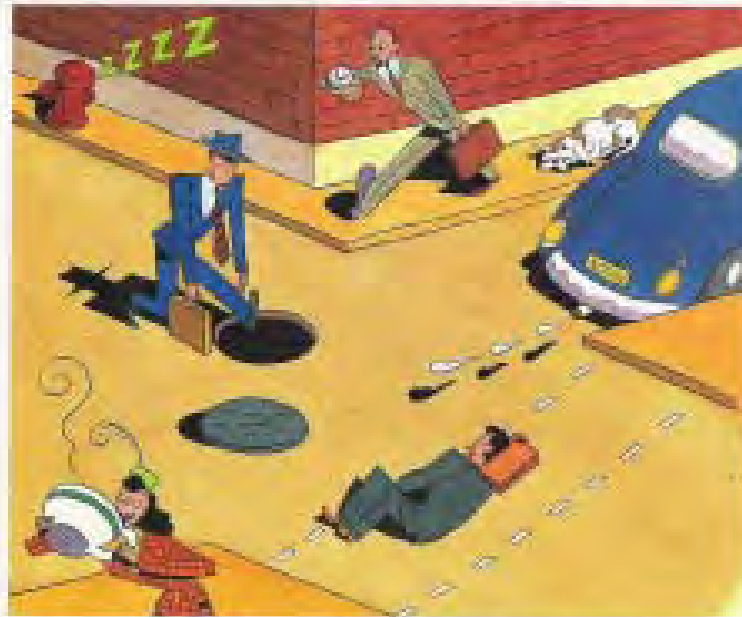
8. Sustenance

- **Nutrition**
- **Hydration**
- **Rest**
- **Sleep**
- **Regeneration**



Sleep Thieves

*An Eye-opening Exploration Into
the Science & Mysteries of Sleep*

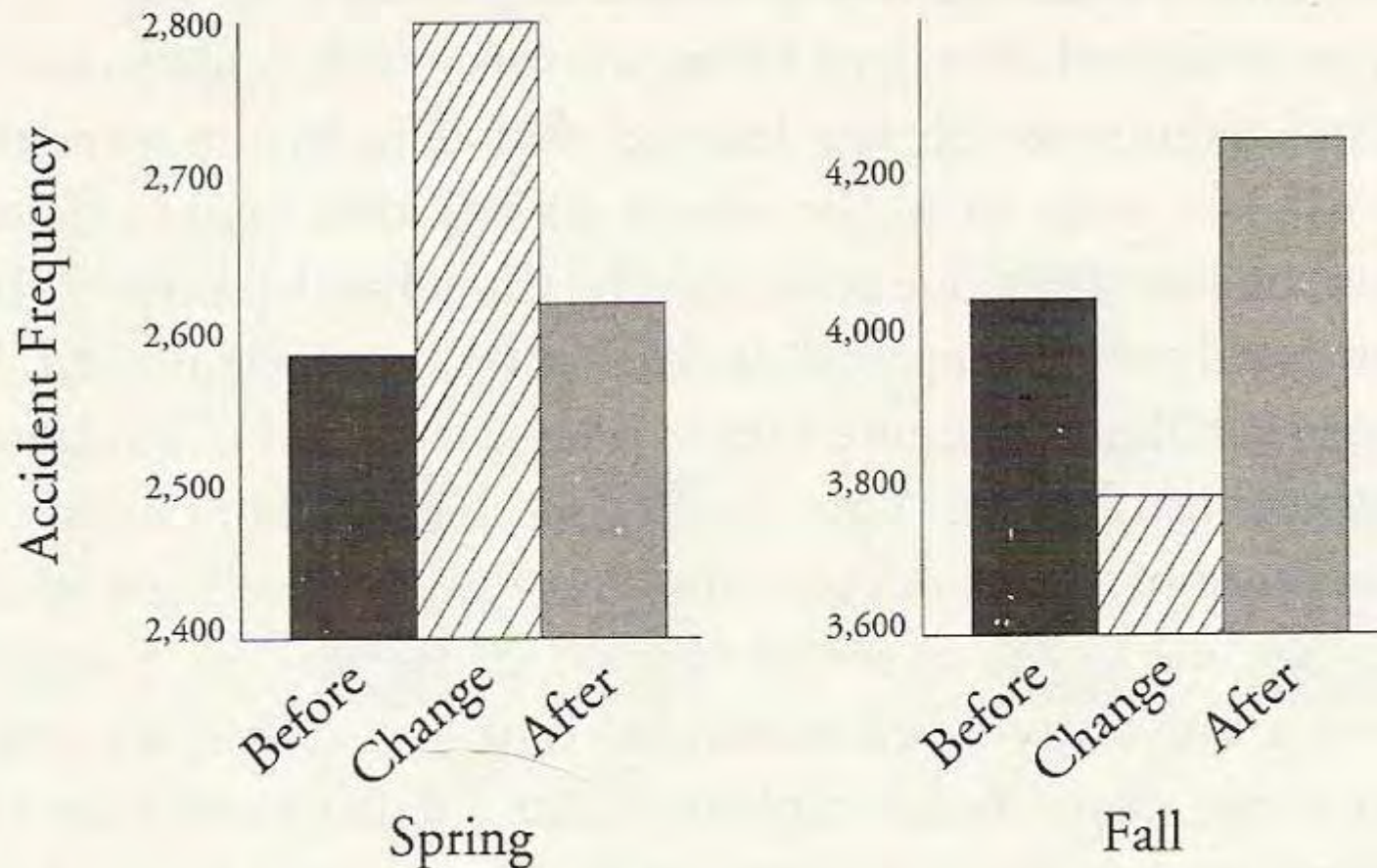


STANLEY COREN

*Author of the Best-Selling **The Intelligence of Dogs***

FIGURE 3

Number of traffic accidents in Canada for the Mondays before and after the shifts to daylight savings times for the years 1991 to 1992. Notice the increase in the spring, immediately after we lose an hour of sleep, and the decrease in the fall, when we gain an extra hour of sleep.





Hydrotherapy and cryotherapy



Cold water immersion

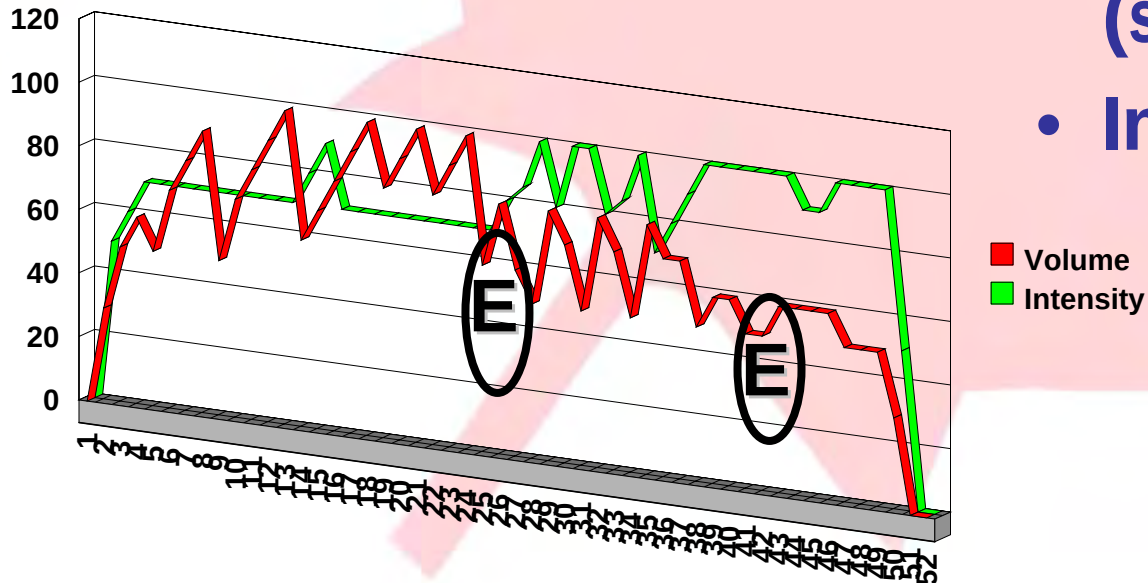


9. Schooling - Études

- Integrate school loads
- Overstress
- Interference

- Intégration de la charge scolaire
- Stress excessif (surmenage)
- Interférence

Volume and Intensity



10. Socio-Cultural - Aspect socioculturel

- **Socialization via sport**
- **Sport socialization - sport sub-culture**
(Life style; 24 hour athlete, etc.)
- **Team building**
- **Group dynamics**
- **Socialisation par le sport**
- **Socialisation dans le sport - sous-culture du sport**
(style de vie; athlète 24 heures sur 24, etc.)
- **Constitution de l'esprit de corps**
- **Dynamique de groupe**





Chinese Physical Literacy

Children on holiday from school, Haozhou, Eastern China



“You have to lay the foundations first, & then come to the building and finally the skyscraper can be done”.

Huang Yubin,
Gymnastics Coach

Physical Literacy

Active Start

FUNDamental

Learning to Train

Excellence

Training to Train

Training to Compete

Training to Win

Life-long
Physical Activity

Active for Life



The Handwriting on the Wall

Change Happens

They Keep Moving the Cheese

Anticipate Change

Get Ready for the Cheese to Move

Monitor Change

Smell the Cheese Often

So You Know When It Is Getting Old

Adapt to Change Quickly

The Quicker You Let Go of Old Cheese,
The Sooner You Can Enjoy New Cheese

Change

Move with the Cheese

Enjoy Change!

Savor the Adventure
and the Taste of New Cheese!

Be Ready to Quickly Change Again and Again

They Keep Moving the Cheese

From the national bestseller
Who Moved My Cheese?

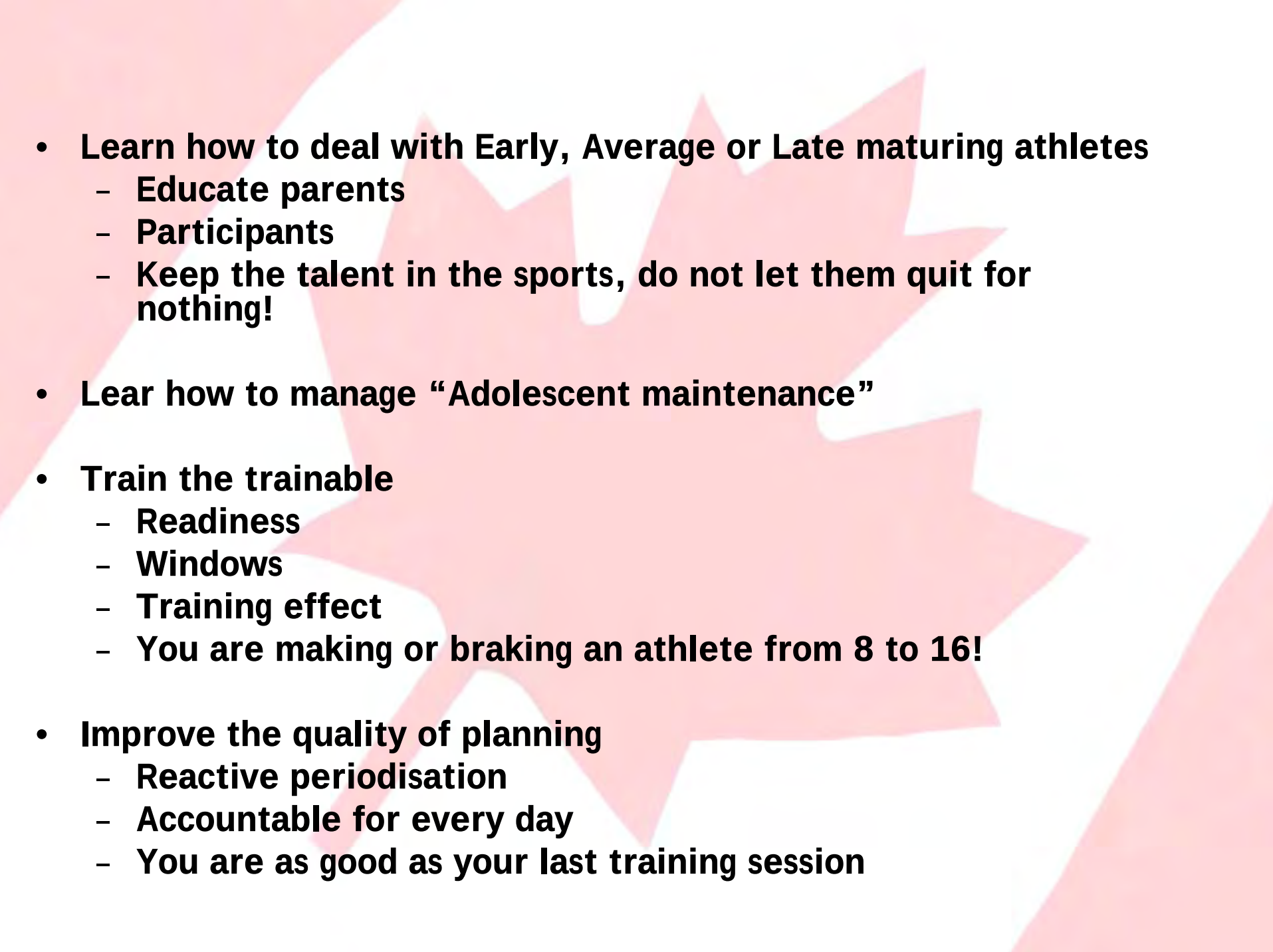
An Amazing Way to Deal with Change in Your Work & in Your Life

© 1998 Spencer Johnson, M.D.

For more information call (808) 637-9030.

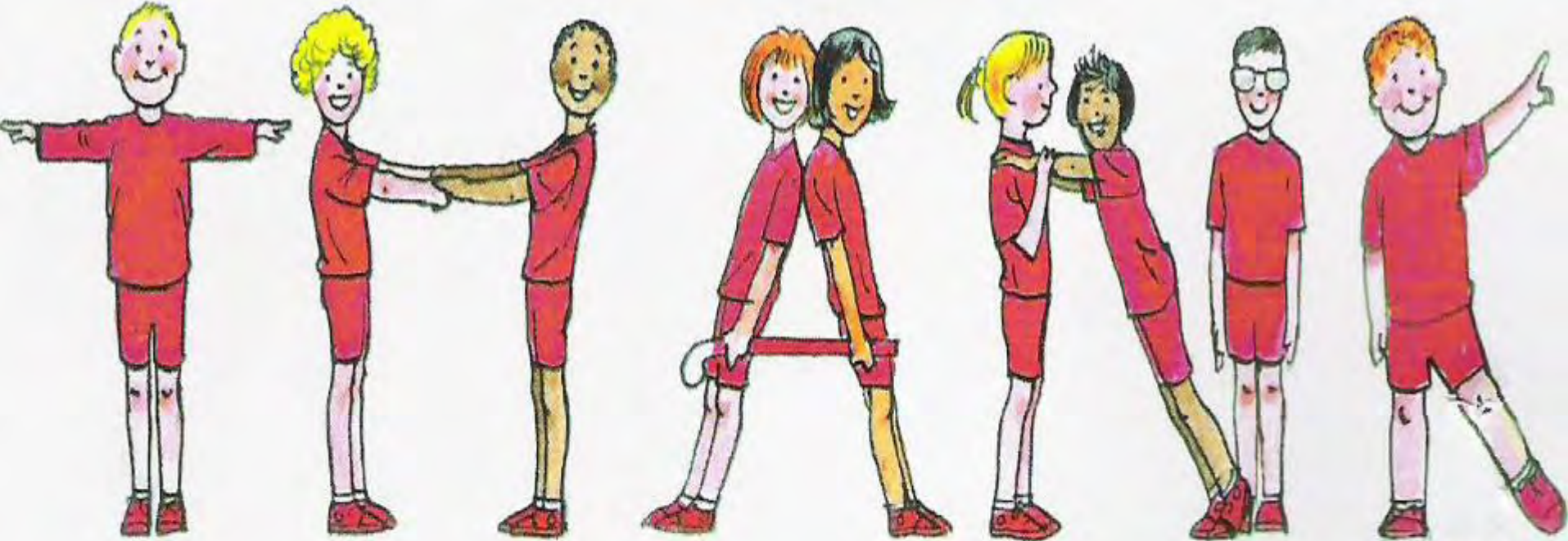
Conclusion and recommendation

- **Do not treat your developmental athletes as miniature adults**
- **Monitor G & D, M regularly**
 - **Once a year from 0 to 6 years**
 - **From 6 to the onset of PHV once a year**
 - **Standing height**
 - **Sitting height**
 - **Arm span**
 - **After the onset of PHV four times per year**
 - **Standing height**
 - **Sitting height**
 - **Arm span**
- **Find the solution for Relative Age**

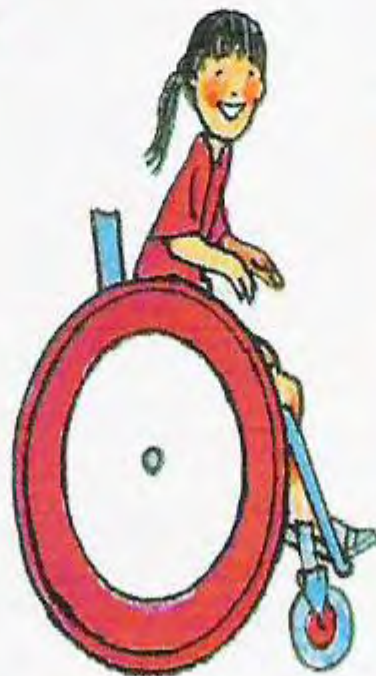
- 
- **Learn how to deal with Early, Average or Late maturing athletes**
 - **Educate parents**
 - **Participants**
 - **Keep the talent in the sports, do not let them quit for nothing!**
 - **Lear how to manage “Adolescent maintenance”**
 - **Train the trainable**
 - **Readiness**
 - **Windows**
 - **Training effect**
 - **You are making or braking an athlete from 8 to 16!**
 - **Improve the quality of planning**
 - **Reactive periodisation**
 - **Accountable for every day**
 - **You are as good as your last training session**

The Implementation Challenge!





W. RUDLING



Questions ?

