IDENTIFYING RISK FACTORS FOR INJURY & ILLNESS IN YOUNGER RUNNERS-

An Overview

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INTRODUCTION I

- Running is a popular sport for children throughout the world.
- Globally, running participation rates for preadolescents and adolescents vary reaching as high as 40% in some regions of the world.
- In the USA, running is the second most common physical activity among girls age 12–15 years (34.9%) and boys age 12–15 years (33.5%).

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INTRODUCTION II

- With the growth of participation in youth running, there has been an observed increase in the number of running-related injuries.
- Most injuries are minor in nature, involving sprains, strains and apophyseal injuries.
- More serious injuries, including stress fractures or physeal injuries, are much far less common.

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INTRODUCTION III

- Although some sports medicine organisations have focused on youth athletes and youth sport safety guidelines, no specific recommendations have been published for youth running.
- The expert panel convened to :
  - ► Identify evidence-based risk factors for injury or illness in the youth runner.
  - ► Describe and establish recommendations for injury and illness risk screening in the youth runner.
  - ► Provide recommendations for adequate nutrition, safe training loads and readiness for youth runners to minimise potential negative impacts of distance running.

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ALL INJURIES: GENDER

- Evidence strongly supports girls are at higher risk for running related injury and greater time loss from injury than boys.
- *Strength of recommendation taxonomy (SORT): A*

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STRENGTH OF RECOMMENDATION TAXONOMY-(SORT)

SORT	CEBM	BMJ's Clinical Evidence
A. Recommendation based on consistent and good quality patient-oriented evidence	A. Consistent level 1 studies	Beneficial
B. Recommendation based on inconsistent or limited-quality patient-oriented evidence	B. Consistent level 2 or 3 studies or extrapolations from level 1 studies	Likely to be beneficial Likely to be ineffective or harmful (recommendation against)
	C. Level 4 studies or extrapolations from level 2 or 3 studies	Unlikely to be beneficial (recommendation against)
C. Recommendation based on consensus, usual practice, disease-oriented evidence, case series for studies of treatment or screening, and/or opinion	D. Level 5 evidence or troublingly inconsistent or inconclusive studies of any level	Unknown effectiveness

SORT, Strength Of Evidence Taxonomy; CEBM, Centre for Evidence-Based Medicine; BMJ, BMJ Publishing Group.

Table 3. Suggested Walkovers between Taxonomies for Assessing the Strength of a Recommendation Based on a Body of Evidence

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ALL INJURIES: PREVIOUS INJURY

- Evidence strongly supports prior injury as risk factor for future injury in the lower extremity in adolescent runners.
- *Strength of recommendation taxonomy (SORT): A*

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ALL INJURIES: HEIGHT & WEIGHT

- Evidence does not support height or weight as risk factors for injury in adolescent cross country runners.
- There are no studies assessing how the change in height and weight impacts injury in the pre-adolescent youth runner.
- *Strength of recommendation taxonomy (SORT): B*

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ALL INJURIES: BODY MASS INDEX (BMI)

- Evidence supports low-normal BMI as a risk factor for stress fracture in adolescent girls.
- Higher BMI may be a risk factor for medial tibial stress syndrome (MTSS) in adolescent cross country runners.
- There are no studies assessing how the change in BMI impacts injury in the pre- adolescent youth runner.
- *Strength of recommendation taxonomy (SORT): B*

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ALL INJURIES: AGE

- There is no consistent data addressing either age or developmental stage as a risk factor for injury among youth runners.
- *Strength of recommendation taxonomy (SORT): B*

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ALL INJURIES: ALIGNMENT & STRENGTH

- Limited evidence supports quadriceps angle >20 degrees, muscle weakness (hip abductors, knee extensor and knee flexors), and leg-length inequality (boys >1.5 cm) as risk factors for injury in youth runners.
- *Strength of recommendation taxonomy (SORT): B*

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ALL INJURIES: ALIGNMENT & STRENGTH

- Exercise-based programmes containing elements of 1/ high intensity neuromuscular training, 2/ jumping/plyometrics, and 3/ balance training may help reduce injury risk in youth runners, but prospective studies are needed.
- *Strength of recommendation taxonomy (SORT): C*

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BONE HEALTH: BONE STRESS INJURY *FEMALE RUNNERS*

- Limited evidence supports primary amenorrhea, BMI < 19, prior participation in gymnastics or dance and prior fracture as risk factors for bone stress injury in female adolescent runners.
- *Strength of recommendation taxonomy (SORT): B*

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BONE HEALTH: LOW BONE MINERAL DENSITY (BMD) *FEMALE RUNNERS*

- Limited evidence supports menstrual dysfunction, low BMI, prior bone stress injury or fracture, and longer participation in endurance running as risk factors for low BMD in female adolescent runner.
- *Strength of recommendation taxonomy (SORT): B*

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BONE HEALTH: LOW BMD *MALE RUNNERS*

- Limited evidence for risk factors for low BMD in male runners include: low BMI, prior bone stress injury, low dairy intake, running>30 miles per week, and the belief that being thinner leads to faster running performances.
- *Strength of recommendation taxonomy (SORT): B*

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BONE HEALTH: MENSTRUAL DYSFUNCTION

- Limited evidence supports primary amenorrhea and menstrual dysfunction as risk factors for bone stress injury and low BMD in female adolescent runners.
- *Strength of recommendation taxonomy (SORT): B*

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REFERENCE

- Krabak BJ, Roberts WO, Tenforde AS, *et al.*
- **Youth running consensus statement: minimising risk of injury and illness in youth runners**.
- *British Journal of Sports Medicine* 2021;**55:**305-318.

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