

Recommendations of the Polish Society of Sports Medicine on age criteria while qualifying children and youth for participation in various sports

Tomasz Kostka,¹ Witold Furgal,² Wojciech Gawroński,³ Andrzej Bugajski,⁴ Andrzej Czamara,⁴ Krzysztof Klukowski,⁵ Hubert Krysztofiak,⁶ Romuald Lewicki,⁷ Zbigniew Szyguła,³ Wiesław Tomaszewski,⁴ Tadeusz Trzaska,⁸ Jerzy Widuchowski,⁹ Andrzej Ziemia,¹⁰ Anna Jegier¹¹; on behalf of the Polish Society of Sports Medicine*



This paper is freely available online under the BMJ Journals unlocked scheme, see <http://bjsm.bmj.com/info/unlocked.dtl>

Systematic physical activity is a necessary element of normal development of a young human body.^{1 2} From early childhood, people should participate in sports and recreational activities involving movement. However, organised and systematic learning of a given form of motor activity (physical training), particularly participa-

tion in sport competitions, may result in development of certain abnormalities connected with excessive physical and mental load of a young body, including injuries.³⁻⁶ In recent years, athletes begin specialised training for their sport at increasingly younger ages.^{7 8} This may be due, in part, to increasing pressure from adults (trainers, parents or teachers) on young people to achieve results in sports.⁹⁻¹¹

The current recommendations involve the revised and updated position of the Polish Society of Sports Medicine (PSSM) concerning age criteria when qualifying for training and competitions in selected sport disciplines, previously presented in the sports medical textbook 'Medycyna Sportowa' from 2005,¹² considering current knowledge of the issue.¹³⁻¹⁸ The main aim of this study is to promote participation in systematic motor activity among children and youth, including organised training and competitions, with maximal safety and health protection assurance.

This consensus agreement is based on experts' opinions and growing perception of increasing dangers for participation in competitive sports by children and youth. Evidence-based data concern anatomy, physiology and psychology of children and adolescents.

Although several studies have reviewed sport-related injury risk in children and youth,¹⁹⁻²⁶ data concerning injury incidence are not complete. Especially, only a few studies have assessed long-term effects of participating in competitive sports

in children and youth.²⁷⁻³² Several recent studies also provided new data on mechanisms of sports-related injuries.³³⁻³⁷ Given the growing number of mortal and other serious injuries in various sports, more high-quality prospective studies are needed.³⁸ It is especially important because there is a growing number of reports from sports physicians indicating that many injuries are not reported or even hidden by sports federations. Furthermore, many accidents may occur outside official tournaments, for example, several mortal motor and quad accidents in teenagers during the last couple of years in Poland.

The recommendations in this article reflect analyses of relevant literature regarding sports-related injuries in children and long-term effects of participating in sports. MEDLINE and other available databases were searched using the following keywords: children, adolescents, youth, sports, physical activity, exercise, training, specialisation, Olympic, organised sports, age criteria, injuries, accidents, boxing, combat sports, martial arts, safety, strength and endurance. The recommendations were formulated by the writing group of the two consecutive main boards of the PSSM during the years 2008-2011. The consensus statement was subsequently reviewed by other members of the main board, by outside experts not affiliated with the writing group and by the different sports federations. Draft recommendations were further presented and discussed during several PSSM meetings and congresses in 2010-2011 and were available at the official PSSM website for comments by all PSSM members. The final version of these recommendations was prepared at the beginning of 2011.

The presented age criteria take into account the current ordinance of the Minister of Health from 23 March 2009, concerning the scope of necessary medical examinations and the procedures of qualifying children and youth younger than 21 years for participation in sports and qualifying athletes aged 21-23 years for participation in competitions.³⁹ The criteria have been developed according to the biological (developmental) age. Chronological (calendar) age is not always a good indicator of the development of young organism. Therefore, developmental age (as determined by skeletal age, Tanner staging of puberty, body size, motor skill or psychological function) should rather be used whenever possible, especially when an important drawback in developmental age compared with chronological age is suspected.

¹Polish Society of Sports Medicine, Faculty of Health Sciences, Medical University, Lodz, Poland

²MEDIVITSPORT Health Centre, Tarnobrzeg, Poland

³Department of Sports Medicine, University School of Physical Education, Cracow, Poland

⁴College of Physiotherapy, Wroclaw, Poland

⁵Chair of Physiotherapy, University of Physical Education, Warsaw, Poland

⁶National Centre for Sports Medicine, Warsaw, Poland

⁷Institute of Medical Education, Kielce, Poland

⁸Department of Traumatology of Sports, University of Physical Education, Poznan, Poland

⁹Centre of Arthroscopy and Knee Surgery, Piekary Slaskie, Poland

¹⁰Department of Applied Physiology, Mossakowski Medical Research Centre, Polish Academy of Sciences, Warsaw, Poland

¹¹Department of Sports Medicine, Medical University of Lodz, Lodz, Poland

Correspondence to Professor Tomasz Kostka, Faculty of Health Sciences, Polish Society of Sports Medicine, Medical University of Lodz, Pl. Hallera 1, 90-647 Łódź, Poland; tomaszkostka@wp.pl

General age criteria for participation in sports are as follows:

- ▶ Younger than 6 years – all disciplines based on natural forms of movements in a form of games and plays involving movement.
- ▶ Older than 6 years – the disciplines based on natural forms of movement, developing movement coordination that do not exert selective load on the skeletal system.
- ▶ Older than 8 years – sport disciplines developing agility and speed and dynamics of movements.
- ▶ Older than 10 years – sport disciplines developing endurance and strength.
- ▶ Older than 13 years – disciplines involving a full range of endurance training.
- ▶ Older than 15 years – disciplines in which a full range of static strength exercises is introduced.

Recommendations for combat sports:

1. PSSM does not recommend participation in boxing for children and youth.
2. Children younger than 12 years may participate only in non-contact sports involving training and competition in a form of technique demonstration or directed combat with task performance. They can participate in competition with non-contact activities. In disciplines not involving kicking or hitting, children can participate in training and competition from the age of 9–10 years in accordance with the regulations of sport federations.
3. Youth older than 12 years, who have participated in training and non-contact disciplines for at least 9 months, may participate in classes and training sessions and compete in combat sports with a limited contact if the training or competition does not involve fighting using hand or leg blows with full force and if hitting area is limited in fights with weapon. In all combat sports involving hitting (also using weapon) or kicking, youth younger than 18 years should wear protection on teeth, genitals and breasts (girls) and other body parts according to the regulations of a given federation. Protection is also recommended for those older than 18 years.
4. With respect to point 5, individuals older than 16 years may be allowed to participate in classes, training and competition in full-contact combat sports or martial arts with the rules of participation and competition allowing to defeat the opponent by hand or leg

blows with full strength and in fights using weapon with unlimited range of blows.

5. The age limit mentioned in point 4 may be reduced to 14 years for several below-specified sport disciplines when protective equipment is used during training and competitions.

The above recommendations also concern other forms of physical activity of combat sport nature (eg, aikido, kravmaga and mixed martial arts).

The age categories for various sport disciplines are given below. There are no uniform regulations in the European Union concerning age norms, allowing to start and continue training and competition.⁴⁰ In many countries, including Poland, there are regulations defining age categories, which were developed by various federations and sports unions. These categories are not always in conformity with the knowledge based on science. This may result in excessive psychophysical load of the young organism and potential threat for competitors or their environment. The regulations developed by each federation and sports union are not obligatory for sports physicians. The physician who qualifies children and youth for participation in a given sport discipline should make decisions only based on current recommendations, state regulations and performed medical examinations.

Participation in sports regarding age:

- ▶ without age limits
 - ▷ billiards, bridge, golf, ringo, snooker, chess, tee-ball, draughts and angling.
- ▶ younger than 6 years
 - ▷ in a form of general development exercises preparing for specialist training.
- ▶ older than 6 years
 - ▷ swimming,
 - ▷ soccer,
 - ▷ sport dancing,
 - ▷ table tennis.
- ▶ older than 8 years
 - ▷ acrobatic gymnastics (sport acrobatics),
 - ▷ badminton,
 - ▷ baseball, softball,
 - ▷ orientation race, sport radio orienteering,
 - ▷ curling,
 - ▷ artistic gymnastics,
 - ▷ sport gymnastics,
 - ▷ ice hockey (without body check up to 14 years),
 - ▷ field hockey,

- ▷ horse riding,
- ▷ kendo (presentation of acquired forms),
- ▷ bowling,
- ▷ athletics: short runs,
- ▷ archery,
- ▷ speed skating,
- ▷ figure skating: solo and dancing couples,
- ▷ skiing training: jumps, runs, downhill skiing,
- ▷ basketball,
- ▷ handball,
- ▷ volleyball,
- ▷ tennis,
- ▷ skibob (training),
- ▷ karting sport,
- ▷ fencing,
- ▷ unihockey,
- ▷ rollerskating,
- ▷ wushu (without fighting or using weapon),
- ▷ sailing.
- ▶ older than 10 years
 - ▷ iceboats,
 - ▷ biathlon (without shooting),
 - ▷ judo,
 - ▷ canoeing,
 - ▷ cycling,
 - ▷ athletics: medium- and long-distance runs, jumping,
 - ▷ skiing competition: runs, slalom,
 - ▷ scuba diving (junior category),
 - ▷ rugby,
 - ▷ sledging,
 - ▷ skibobs,
 - ▷ snowboard,
 - ▷ sport shooting (pneumatic weapon).
- ▶ older than 12 years
 - ▷ kendo (limited contact),
 - ▷ kickboxing (limited contact),
 - ▷ athletics: throws (disc, javelin),
 - ▷ skiing competition: jumps, downhill,
 - ▷ harness racing,
 - ▷ sumo (without body mass support),
 - ▷ taekwondo (limited contact),
 - ▷ wrestling.
- ▶ older than 13 years
 - ▷ motorcycle sports,
 - ▷ motorboat,
 - ▷ speedway.
- ▶ older than 14 years
 - ▷ alpinism (sport climbing),
 - ▷ biathlon,
 - ▷ boxing,
 - ▷ ju-jitsu (limited contact),
 - ▷ karate,

- ▷ kendo,
- ▷ athletics: hammer,
- ▷ figure skating: sport pairs,
- ▷ Muaythai (Thai boxing) – specialist training,
- ▷ water skiing,
- ▷ scuba diving,
- ▷ modern pentathlon,
- ▷ water rescuing,
- ▷ sport shooting (bullet weapons),
- ▷ taekwondo,
- ▷ oarsmanship,
- ▷ wushu.
- ▶ older than 15 years
 - ▷ bodybuilding,
 - ▷ hang gliding: glider, motor glider, paraglider pilot,*
 - ▷ weightlifting,
 - ▷ strength triathlon.
- ▶ older than 16 years
 - ▷ alpinism (cave, rock climbing, mountaineering, alpine skiing),
 - ▷ bobsleigh,
 - ▷ ju-jitsu: full contact,
 - ▷ kickboxing: full contact,
 - ▷ Muaythai (Thai boxing) – participation in competitions,
 - ▷ pilot-operator of flying models,*
 - ▷ glider pilot,*
 - ▷ parachute jumping,*
 - ▷ motor vehicle sports.
- ▶ older than 17 years
 - ▷ balloon pilot,*
 - ▷ tourist plane pilot.*

Note. *Act from 3 July 2002. Aviation Regulations. (*Journal of Laws*, No 130, item 1112), and the Act from 29 April 2004 concerning changes in the Act – Aviation Regulations (*Journal of Laws*, No 99, item 1002). Examinations are performed by a certified physician.

The presented criteria consider the most frequently practised sport disciplines. Other disciplines (including all new ones) should be assessed individually by the qualifying physician.

The current recommendations are based on experts' opinions and reflect analyses of relevant literature regarding sports-related injuries in children and long-term effects of participating in sports, as well as the growing perception of increasing dangers for participation in competitive sports by children and youth. We are fully aware that evidence-based data concerning injury incidence are not complete because usually no regular registries exist. Although randomised control trials are not possible to conduct, detailed data on injury incidence and long-term effects of different sports disciplines are badly needed.

Not all the organisations agree with our guidelines – the pressure to win and the rationale that the current guidelines will make difficult the competition with young sportsmen from other countries are enormous. However, there is almost unanimous feeling in the PSSM that we should protect children now, before data on increasing sport-related injury rate continue to further accumulate. We also hope that the current recommendations will begin a wide discussion on how to protect young people from dangers of competitive sports, which should conclude with common guidelines of sports medicine, at least in the European Union.

*Polish Society of Sports Medicine Pl. Hallera 1, 90-647 Lodz, Poland.

Contributors Everyone listed met the ICMJE criteria for authorship.

Acknowledgements The authors thank all of their fellow physicians for consultation in formulating these recommendations. They also thank all sports federations for their guidelines and remarks and sport activists and trainers for their support in writing this document.

Competing interests None.

Provenance and peer review Not commissioned; externally peer reviewed.

Accepted 30 August 2011

REFERENCES

1. Sports and children: consensus statement on organized sports for children. FIMS/WHO ad Hoc Committee on Sports and Children. *Bull World Health Organ* 1998;**76**:445–7.
2. European Commission. White Paper on Sport. 2009. http://ec.europa.eu/sport/white-paper/whitepaper104_en.htm (accessed 15 Feb 2011).
3. **Adesunkanmi AR**, Oginni LM, Oyelami AO, et al. Epidemiology of childhood injury. *J Trauma* 1998;**44**:506–12.
4. **McCroly P**, Meeuwisse W, Johnston K, et al. Consensus Statement on Concussion in Sport: the 3rd International Conference on Concussion in Sport held in Zurich, November 2008. *Br J Sports Med* 2009;**43**(Suppl 1):i76–90.
5. **Caine D**, Caine C, Maffulli N. Incidence and distribution of pediatric sport-related injuries. *Clin J Sport Med* 2006;**16**:500–13.
6. **Caine D**, Maffulli N, Caine C. Epidemiology of injury in child and adolescent sports: injury rates, risk factors, and prevention. *Clin Sports Med* 2008;**27**:19–50, vii.
7. **Morrison AB**, Schöffl VR. Physiological responses to rock climbing in young climbers. *Br J Sports Med* 2007;**41**:852–61.
8. Intensive training and sports specialization in young athletes. American Academy of Pediatrics. Committee on Sports Medicine and Fitness. *Pediatrics* 2000;**106**:154–7.
9. **Washington RL**, Bernhardt DT, Gomez J, et al. Organized sports for children and preadolescents. *Pediatrics* 2001;**107**:1459–62.
10. **Blanpain R**. *The Legal Status of Sportsmen and Sportswomen under International, European and Belgian National and Regional Law*. The Hague, London and New York, NY: Kluwer Law International 2002.
11. **David P**. *Human Rights in Youth Sport – A Critical Review of Children's Rights in Competitive Sports*. London and New York, NY: Routledge Taylor and Francis Group 2005.
12. **Furgal W**, Gawroński W. Kryteria wiekowe przy kwalifikacji do treningu i zawodów w wybranych dyscyplinach sportowych [Age criteria when qualifying for training and competitions in selected sport disciplines]. In: Jegier A, Nazar K, Dziak A, eds. *Medycyna Sportowa [Sports Medicine]*. Warszawa: Polskie Towarzystwo Medycyny Sportowej 2005:747–50.
13. **Wingfield K**, Matheson GO, Meeuwisse WH. Preparticipation evaluation: an evidence-based review. *Clin J Sport Med* 2004;**14**:109–22.
14. **Allender S**, Cowburn G, Foster C. Understanding participation in sport and physical activity among children and adults: a review of qualitative studies. *Health Educ Res* 2006;**21**:826–35.
15. **Rice SG**. Medical conditions affecting sports participation. *Pediatrics* 2008;**121**:841–8.
16. **Darrow CJ**, Collins CL, Yard EE, et al. Epidemiology of severe injuries among United States high school athletes: 2005–2007. *Am J Sports Med* 2009;**37**:1798–805.
17. **Maffulli N**, Longo UG, Gougoulas N, et al. Long-term health outcomes of youth sports injuries. *Br J Sports Med* 2010;**44**:21–5.
18. **McCroly P**. Sports concussion and the risk of chronic neurological impairment. *Clin J Sport Med* 2011;**21**:6–12.
19. **McGuine T**. Sports injuries in high school athletes: a review of injury-risk and injury-prevention research. *Clin J Sport Med* 2006;**16**:488–99.
20. **Knowles SB**. Is there an injury epidemic in girls' sports? *Br J Sports Med* 2010;**44**:38–44.
21. **Hootman JM**, Dick R, Agel J. Epidemiology of collegiate injuries for 15 sports: summary and recommendations for injury prevention initiatives. *J Athl Train* 2007;**42**:311–19.
22. **Frisch A**, Croisier JL, Urhausen A, et al. Injuries, risk factors and prevention initiatives in youth sport. *Br Med Bull* 2009;**92**:95–121.
23. **Zazryn TR**, Finch CF, McCroly P. A 16 year study of injuries to professional boxers in the state of Victoria, Australia. *Br J Sports Med* 2003;**37**:321–4.
24. **Zazryn TR**, McCroly PR, Cameron PA. Neurologic injuries in boxing and other combat sports. *Neural Clin* 2008;**26**:257–70; xi.
25. **Zazryn TR**, McCroly PR, Cameron PA. Injury rates and risk factors in competitive professional boxing. *Clin J Sport Med* 2009;**19**:20–5.
26. **Loosemore M**, Knowles CH, Whyte GP. Amateur boxing and risk of chronic traumatic brain injury: systematic review of observational studies. *BMJ* 2007;**335**:809.
27. **Rabadi MH**, Jordan BD. The cumulative effect of repetitive concussion in sports. *Clin J Sport Med* 2001;**11**:194–8.
28. **Jordan BD**. Chronic traumatic brain injury associated with boxing. *Semin Neurol* 2000;**20**:179–85.
29. **McCroly P**, Zazryn T, Cameron P. The evidence for chronic traumatic encephalopathy in boxing. *Sports Med* 2007;**37**:467–76.
30. **Gavett BE**, Stern RA, McKee AC. Chronic traumatic encephalopathy: a potential late effect of sport-related concussive and subconcussive head trauma. *Clin Sports Med* 2011;**30**:179–88, xi.
31. **Bazarian JJ**, Cernak I, Noble-Hausselsin L, et al. Long-term neurologic outcomes after traumatic brain injury. *J Head Trauma Rehabil* 2009;**24**:439–51.
32. **Porter MD**. A 9-year controlled prospective neuropsychological assessment of amateur boxing. *Clin J Sport Med* 2003;**13**:339–52.
33. **Förstl H**, Haass C, Hemmer B, et al. Boxing-acute complications and late sequelae: from concussion to dementia. *Dtsch Arztebl Int* 2010;**107**:835–9.
34. **Tanriverdi F**, De Bellis A, Battaglia M, et al. Investigation of antihypothalamus and antipituitary antibodies in amateur boxers: is chronic repetitive head trauma-induced pituitary dysfunction

- associated with autoimmunity? *Eur J Endocrinol* 2010;**162**:861–7.
35. **Graham MR**, Myers T, Evans P, *et al.* Direct hits to the head during amateur boxing is associated with a rise in serum biomarkers for brain injury. *Int J Immunopathol Pharmacol* 2011;**24**:119–25.
36. **McKee AC**, Cantu RC, Nowinski CJ, *et al.* Chronic traumatic encephalopathy in athletes: progressive tauopathy after repetitive head injury. *J Neuropathol Exp Neurol* 2009;**68**:709–35.
37. **McKee AC**, Gavett BE, Stern RA, *et al.* TDP-43 proteinopathy and motor neuron disease in chronic traumatic encephalopathy. *J Neuropathol Exp Neurol* 2010;**69**:918–29.
38. **Steffen K**, Engebretsen L. More data needed on injury risk among young elite athletes. *Br J Sports Med* 2010;**44**:485–9.
39. ROZPORZĄDZENIE MINISTRA ZDROWIA z dnia 23 marca 2009 r. w sprawie zakresu koniecznych badań lekarskich, częstotliwości ich przeprowadzania oraz trybu orzekania o zdolności do uprawiania określonej dyscypliny sportu przez dzieci i młodzież do ukończenia 21. roku życia oraz przez zawodników pomiędzy 21. a 23. rokiem życia. DZIENNIK USTAW Z 2009 R. NR 58 POZ. 483, 2009. [Ordinance of the Minister of Health from 23 March 2009, concerning the scope of necessary medical examinations and the procedures of qualifying children and youth below the age of 21 for participation in sports as well as qualifying athletes aged 21–23 for participation in competitions].
40. **European Commission**. Study on the Training of Young Sportsmen and Sportswomen in Europe: Identification, Evaluation and Comparison of the Quality Criteria. Ineum Consulting – Taj, 2007. http://ec.europa.eu/sport/pdf/doc494_en.pdf (accessed 15 Feb 2011).