Highlights on the Preparticipation Physical Evaluation in Athletes

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Regular physical activity is good for health. It helps promote wellness and prevent diseases including cardiovascular diseases. Scientific societies recommend performing 30 minutes of moderate intensity exercise per day at least five days per week for adults, and recommend that children and youth 5 to 17 years of age perform at least 60 minutes of moderate to vigorous physical activity daily.

The number of children and adolescents practicing sports is increasing in Lebanon. More schools and universities are having their own varsity teams in football, basketball and other types of competitive sports; and many are participating in competitions organized at a national level among universities or schools. Athletes might be at risk of injuries during sports participation. Several scientific societies in the US and other European countries recommend conducting preparticipation physical evaluation (PPE) to athletes on a regular basis.

Objectives of the Preparticipation Physical Evaluation

Preparticipation physical evaluation is a golden opportunity to ensure the safe participation of athletes in sports as well as their wellbeing. PPE allows the detection of conditions that can put the athlete at higher risk of injury or disability, or that might be life-threatening. The PPE is also a great occasion to provide athletes with tips and advice to prevent injuries.
The main objectives of the PPE are:
• To enhance the safe participation of athletes in sports especially competitive sports.
• To identify medical conditions that might lead to life threatening events (such as sudden cardiac arrest) during participation. Hypertrophic cardiomyopathy is an example of such conditions.
• To identify medical conditions that necessitates treatment before or during participation such as hypertension.
• To identify old or existing musculoskeletal injuries and provide rehabilitation.
• To identify and treat conditions that might interfere or affect the performance of the athlete such as exercise-induced bronchospasm.

Components of the Preparticipation Physical Evaluation

The American Academy of Family Physicians, the American Academy of Pediatrics, the American College of Sports Medicine, the American Medical Society for Sports Medicine, the American Orthopedic Society for Sports Medicine, and the American Osteopathic Academy of Sports Medicine recommend the use of standardized preparticipation physical evaluation forms that include:
• Targeted medical and family history
• Targeted physical examination, with particular emphasis on the musculoskeletal and cardiovascular systems.

Medical history: The medical history including personal and family history along with a review of systems have been reported to detect around 75% of the conditions that might restrict the participation of the athlete or require further evaluation. This section of the PPE forms is usually filled by the athlete or his/her parents (in case of minors). The history includes a general medical personal history, injury history, and a cardiovascular history, in addition to relevant family history (mainly any history of sudden cardiac death and/or heart problem in a relative at an age younger than 50 years). It is important to emphasize the following:
• Past medical history of the athlete including conditions under treatment
• Previous surgeries
• Any abnormality or loss of function of any of the paired organs in the body such as eyes, kidneys or testicles
• Intake of any current medications, or supplements; special emphasis should be put on the intake of any performance-enhancing drugs
• Immunization history
• Menstrual history in female athletes
• A history of rapid change in body weight
• Injury history
• Presence of alarming symptoms for underlying cardiovascular diseases namely syncope or near syncope during exercise, chest pain or tightness during exertion, history of unexplained fatigue or dyspnea or palpitation during exercise.

Physical Examination: this includes assessment of height, weight and blood pressure, vision screening in addition to conducting targeted examination of the main systems of the body namely cardiovascular system, musculoskeletal, neurologic, lungs, abdomen and male genitalia. It is worth noting that the musculoskeletal screening exam can be a rapid one using the 2 minute screening test. The cardiovascular examination is to include auscultation of the heart for any murmurs, examination of pulses and examination for stigmata of Marfan syndrome.

Electrocardiogram: there is still controversy whether to include electrocardiogram (EKG) in the PPE or not. However, some scientific societies such as the European Society of Cardiology recommends including an EKG in the evaluation of athletes. Limiting PPE to medical history and physical examination was not found to be very sensitive in detecting cardiovascular conditions that might predispose young athletes to sudden cardiac death. Adding an EKG was found to improve the sensitivity and specificity of this evaluation.

Timing and frequency of the preparticipation physical evaluation

It is recommended to perform the PPE four to six weeks before the engagement of the athlete in competitive sports. This will permit enough time to evaluate and treat medical problems and/or rehabilitate musculoskeletal injuries before sports participation.
The frequency of conducting PPE varies among different authorities. The American Heart Association recommends that a history and physical examination be performed every two years during sports participation, with an interim history taken in the intervening years. Other authorities recommend conducting the PPE before each new level of participation (middle school, high school, and college), with yearly updates of the history and targeted physical examination.

Location of the preparticipation physical evaluation

The PPE may be performed in the office/clinic setting or through a station approach.
In the office/clinic setting, the evaluation is usually conducted by the primary care physician namely pediatrician, family physician or general practitioner. The office-based model offers the advantages of privacy and continuity of care, as well as the knowledge of past medical and family history of the athlete by the physician. It provides also the opportunity to address sensitive issues such as alcohol use, drug use and other risky behaviors. However, the complete examination is time consuming.
The station approach depicts the examination of athletes by different examiners through a series of stations specific to the individual components of the evaluation. The station-based approach is time efficient, more oriented to sports, and inexpensive. However, this type of approach

does not provide generally confidentiality or privacy, and may not provide continuity of care.
Can the PPE be part of the wellness adolescent and child visit? Yes, it can be part of this visit, provided that it covers as well the components of the sports history and related physical exam.

Decisions based on the preparticipation physical evaluation
The outcomes of the PPE will enable the physicians to decide whether the athlete can participate in sports. The decisions can be as follows:
• Cleared to participate in all sports activities without any restriction
•Cleared with recommendations for additional evaluation
• Not cleared to specific types of sports
• Not cleared or the status needs further evaluation and tests to be conducted.

Situation in Lebanon

The preparticipation physical evaluation is not yet widely practiced in schools and universities in Lebanon. The World Health Organization developed a guidebook for school health physical examination in collaboration with the Ministry of Public Health, the Ministry of Education and Higher Education, and the Lebanese Order of Physicians. The guidebook was updated 2-3 years ago with a newly developed section on the preparticipation physical evaluation in athletes. However, the PPE is still not widely integrated in the school health evaluation in public schools. The situation in private schools and universities depends on the administration of each institution.
CHAMPS Fund, a not for profit organization that is established in the department of family medicine at the American University of Beirut Medical Center has been collaborating with the Sports department at the American University of Beirut (AUB) in conducting the PPE for AUB athletes since 5 years. The evaluation includes performing the electrocardiogram as well. It started to be conducted in the clinics for the first 2 years, then moved to be station-based within the AUB sports facilities. A team of volunteers including medical doctors (family physicians, orthopedic surgery, sports medicine, and cardiologists), nurses, and medical and nursing students with the support of physiotherapists from sports teams were involved in the PPE. This evaluation enabled the

detection of several medical conditions among student athletes, which would have affected their performance or put them at risk of injuries or life threatening conditions. It is about time to make the preparticipation physical evaluation a general practice in all schools, universities and sports clubs.

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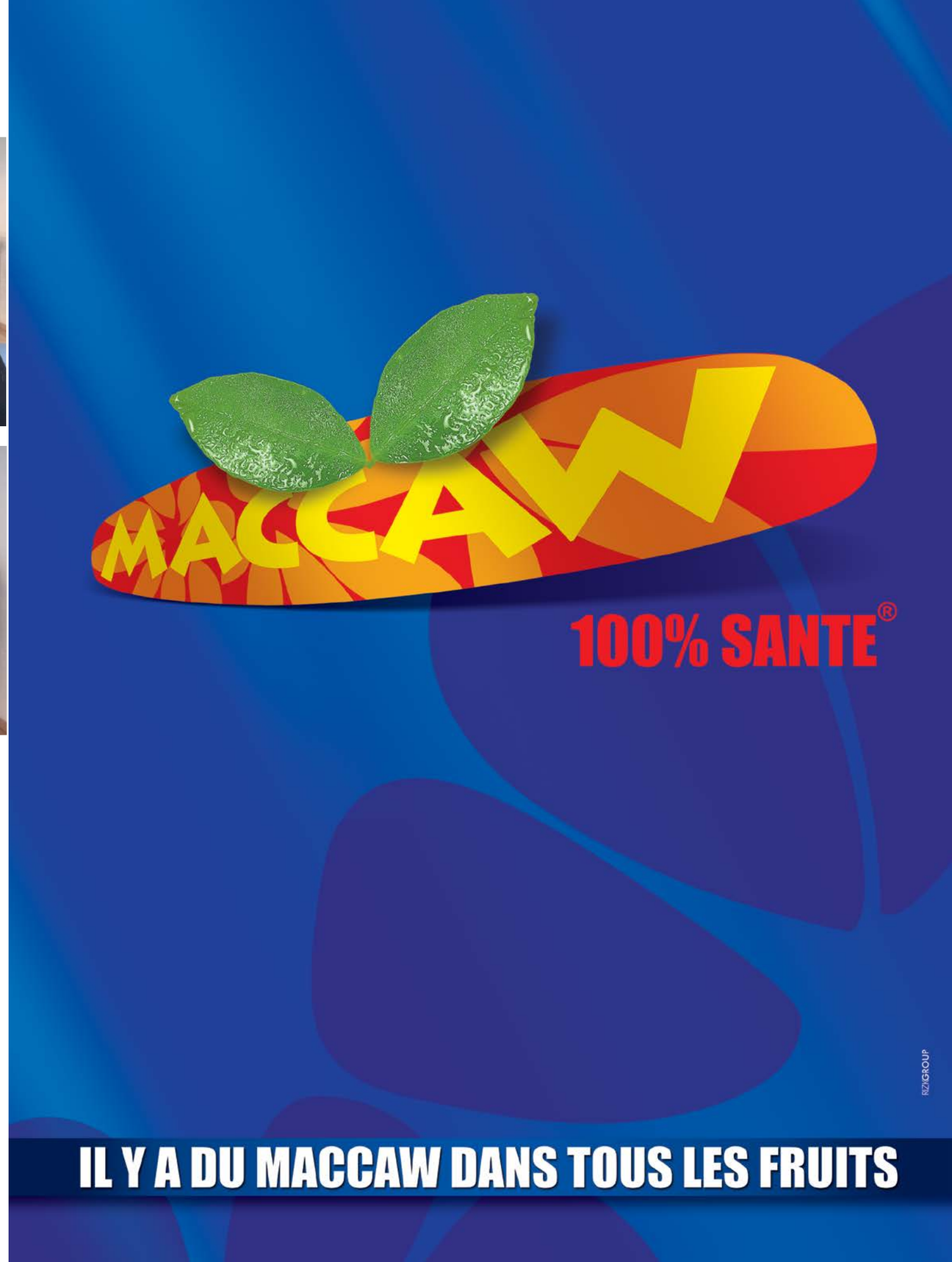
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