

# ECG is a cost effective method for diagnosing cardiac abnormalities in young athletes

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Cardiovascular screening with ECG in young athletes is a cost effective way of diagnosing cardiac abnormalities, at just 138 Swiss Francs (about €115) per athlete. The findings were presented today, August 26, at the ESC Congress 2012 by Dr Andrea Menafoglio from Switzerland.

Sport is beneficial for health in most people. But for the [small minority](#) of the population who has [cardiovascular abnormalities](#), sport can cause harm and very rarely – in one to three per 100,000 athletes per year – it can lead to [sudden cardiac death](#).

"The [cardiac arrest](#) of a professional sportsman in the field, who represents the essence of [physical performance](#), has a profound psychological impact in the community and regularly raises the question of how to prevent such a dramatic event," said Dr Menafoglio. "There is debate about which [screening methods](#) are useful for [cardiovascular screening](#) of young athletes and one of the principal controversies concerns the role of ECG in the screening strategy."

He added: "Solid data indicate that cardiovascular screening including a resting electrocardiogram (ECG) can prevent a substantial proportion of these tragic events, and the European Society of Cardiology (ESC) and major sports associations recommend such a screening programme. However, ECG has been considered by some to have presumed inherent limitations, meaning that subsequent cardiac examinations are required.

This substantially raises the costs of a programme that should be implemented at large scale to prevent these relatively rare fatal events.

The study presented at the ESC Congress 2012 assessed the contribution of ECG to diagnosing [cardiac abnormalities](#) and the total costs of a programme of cardiovascular screening with ECG in young athletes in Switzerland. The most recent and rigorous criteria for interpreting ECG in athletes were used.

Competitive athletes aged 14-35 years were assessed based on ESC recommendations using personal and family history, physical examination and resting ECG. The ECG was interpreted based on the 2010 ESC recommendations, adapted at some points to take account of evidence accumulated after the recommendations were published. Cardiac examinations were performed by cardiologists or sport physicians with extensive clinical experience. In cases of abnormal findings in history, physical exam or ECG, further examinations were undertaken according to the usual clinical practice. For each athlete, the costs of screening and all subsequent examinations were calculated according to Swiss medical rates.

Between February 2011 and April 2012, 1070 athletes were examined. Mean age was 19.7 years and 75% were males. Football was the most frequent sport (37% of athletes). Athletes trained for a mean of 7.8 hours per week and for a mean of 8.9 years. Most of the athletes (71%) did competitions at regional level.

A total of 6.3% athletes required further examinations: 1.3% due to personal or family history, 1.4% due to [physical examination](#) and 3.9% due to abnormal ECG. The most frequent subsequent cardiac examinations undertaken were echocardiogram (5.6% of athletes) and exercise stress test (4.0%).

A new cardiac abnormality, previously unknown, was finally established in 2.0% of athletes. The most frequent was ventricular premature beats (0.6% of athletes). In 0.4% of athletes, a cardiac abnormality potentially responsible for sudden cardiac death was established (Wolff-Parkinson-White syndrome and long QT syndrome).

ECG contributed considerably towards establishing a new cardiac diagnosis. Without ECG, a new diagnosis would have been established in 0.8% of athletes, compared to 2.0% with ECG.

The mean cost per athlete of the entire cardiac screening programme was 138 Swiss Francs (about €115).

"Cardiovascular screening with ECG in young [athletes](#) is feasible with few subsequent examinations and, accordingly, at low cost, even in Switzerland where the costs of medical services are rather high," said Dr Menafoglio.

"However, cardiac examination and ECG interpretation in [young athletes](#) is far from easy and requires specific competences," he added. "It is only with considerable experience and applying rigorous ECG criteria that effective [screening](#) can be performed, with few subsequent examinations and low cost, allowing implementation at large scale. Without such experience and criteria there could be an explosion of examinations, costs, anxiety and inappropriate diagnosis."

Provided by European Society of Cardiology

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