On August 10th 2014, 27-year-old Chris Head collapsed at Bondi Beach, on the last stretch of the annual City To Surf. He joins the long, but only partially recognised, list of young people who have died when their heart stopped suddenly. This is a cardiac arrest.

Most of us think that cardiac arrest is something that happens to the elderly, or at least to someone much older than however old we happen to be, but the truth is that although it is most common in those groups, it can strike anyone, anywhere, at any time. There are reasons for this, however, and the majority of people who have a sudden cardiac arrest outside hospital are likely to have had an acute coronary syndrome, or heart attack, when the blood flow to the heart muscle is unexpectedly and rapidly blocked, and a piece of muscle dies. This dead muscle acts as a focus for chaos to strike the normally organised marching rhythm of the heart, turning it from a pump which beats tirelessly 100,000 times a day, to a wriggling mass of muscle spaghetti which cannot pump at all.

If you smoke cigarettes, if you have high cholesterol, high blood pressure, diabetes, or if you have someone in your close family who had an early heart attack, you have some obvious reasons to have a cardiac arrest. But what about young people; what about sportsmen and sportswomen; what about the children whose hearts stop with no warning whatsoever?

Well the truth is that there are sometimes warnings that could help us in identifying who may be at risk, but as in so many situations we need to know what to be alert for. The cause of most cardiac arrests in young people is an abnormal rhythm, but rather than the common causes mentioned above, it is often due to congenital problems, or ones which they are born with.

Young people and children who have a cardiac arrest most commonly have a cardiomyopathy, which accounts for about a half to two thirds of cases. Cardio means heart, -myo means muscle, and –pathy means a disorder in a part of the body. Cardiomyopathies can involve overgrowth of the heart muscle, leading to problems with oxygen supply, but can also involve abnormalities in the blood vessels that supply the heart muscle, meaning that they often cannot supply enough blood to the muscle. This is made much worse when people exercise and the heart muscle needs many times more oxygen to work properly.

Cardiomypathies are often present at birth, and are inherited from parents, but sometimes they can be caused by infections, and sometimes cardiac arrest occurs in children and young adults without this condition. In these cases there may be an underlying abnormality of the electrical rhythm of the heart that predisposes them to a sudden chaotic deterioration, such as in the Long QT Syndrome (a fault in the electrical system of the heart), and sometimes a cardiac arrest may occur secondary to some other cause, such as trauma to the chest, a condition called Commotio Cordis, or because of drug-related heart rhythm abnormality.

Cardiomyopathies are rare, and deaths from cardiomyopathies are even rarer, but when these deaths occur it is often during physical activity such as sport. Millions of Australians of all ages play sport every weekend without incident, of course, but how do we spot those at risk?

Many young people who have a cardiac arrest have symptoms prior to the event, or at least have something in their family history that should raise suspicion of possible disaster. Two key features emerge that should raise huge warning signs in the minds of parents, friends, schools, coaches and sports clubs. The first is a history of sudden collapses or loss consciousness in a child or young adult. Although many people faint, or pass out when the weather is hot, when they haven't had enough fluids, or even when they are emotionally stressed, this is different. Sudden syncope, as it is called by doctors, refers to a situation where there is no obvious cause and where it is not related to standing up from sitting or lying, which is almost always involved in benign causes. If your child or teenager has had a sudden or unexplained loss of consciousness, especially when just sitting down or resting, having them checked by a doctor, and preferably a paediatric cardiologist, is essential.

The other main predictor of sudden cardiac death in the young is a history of a similar event happening with someone else in the family. This is particularly important when the person concerned was younger than about 45-50, as cardiac disease in people younger than this is rare.

So, should sporting clubs screen young people for the potential for cardiac arrest? Well, screening is often a vexed question, as any screening program or test must carry with it the possibility of doing something about what is found, which may in these cases just be observation and a restriction on activity, but which also may mean more interventional treatment from specialists. Any screening program also has to be sensitive enough to pick up disease early, and therefore give a better chance of good outcomes, but must also be specific enough not to identify people without the problem as at risk, what we would call a false positive test. Many tests such as heart tracings, or electrocardiograms (ECGs) may reveal an abnormality or may reveal nothing, even if there is an underlying problem, but they may also reveal what looks like a potential problem but which is so non-specific that it doesn't help, but along the way causes a great deal of worry and distress.

Echocardiography, using sound waves to visualise the heart, is an effective way of diagnosing cardiomyopathies, but is expensive, resource intensive, needs skilled operators and is often just unavailable. So what should parents, schools, sports clubs, trainers and coaches actually do?

We believe that it is not unreasonable to seek any evidence of the two important historic predictors of cardiac arrest. If a child or young adult has any history of sudden loss of consciousness, and particularly on more than one occasion, or if there is a family history of sudden death without obvious cause, below the age of 45-50, further investigation should be pursued and a limitation on involvement with sports should keep them safe until there has been a chance to assess their risk.

Finally though, what is needed for cardiac arrest in both the young and old, is a system to exist which ensures that at least 50% of the Australian population are trained in High-Quality CPR, that there are Automated External Defibrillator programs set up with devices in all public and many private areas, and we need continuous measurement of our society's success at resuscitating cardiac arrest victims.

Take Heart Australia was formed to push for increases in cardiac arrest survival, and these simple interventions have been shown to save more lives than anything else. Seattle introduced these measures and now saves more than 60% of its cardiac arrest victims, whilst across Australia only 10% survive.

There is no reason why Australians can't enjoy this success as well, so join Take Heart Australia and help us save both the old and the young!

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