

Analysis: After Health Scare, Will Sonny Colbrelli Race Again?

Sudden cardiac death (SCD) is a [rare but devastating event](#), often affecting apparently healthy athletes with no prior heart problems. In fact, the typical victim has no suspicion that they are at risk, and prior to the SCD event may have even felt that they were in peak form.

[Sonny Colbrelli](#), last year's Paris-Roubaix winner and current European champion, can now be counted among the estimated 1 in 40,000 to 1 in 80,000 young athletes per year to experience SCD, after his dramatic resuscitation following Stage 1 of the Volta a Catalunya. He was quickly transported to the Hospital Universitari de Girona after being defibrillated on-site for treatment of a life-threatening arrhythmia.

Initial tests were ["inconclusive"](#) in terms of a specific cause of the event, and fortunately showed "no sign of compromised heart function." Following advanced evaluation at the University of Padua Medical School, he [underwent](#) subcutaneous defibrillator (S-ICD) implantation to protect him from further malignant heart arrhythmias.

Most resuscitated SCD victims, like Colbrelli, receive "device" therapy with an implantable cardioverter-defibrillator (ICD) prior to hospital discharge – unless there is a clearly reversible problem identified, which when corrected, eliminates with certainty the risk of SCD recurrence.

ICDs are potentially life-saving devices which are placed in the chest to detect and treat life-threatening heart rhythms – specifically ventricular tachycardia (VT) and ventricular fibrillation (VF) – which can result in SCD. The ICD itself consists of a pulse generator (lithium battery and electronics) contained in a stainless-steel case about the size of a small stopwatch, which is implanted under the skin just below the collar bone.

Most ICDs have one or more long, flexible electrodes or "leads" which are attached to the pulse generator, inserted through the veins toward the heart, and rest in direct contact with the inner surface of the heart muscle. Colbrelli's S-ICD (subcutaneous ICD) is a unique, less invasive alternative now available for younger patients, whereby the electrode "lead" of the system rests beneath the skin along the breastbone, eliminating certain complications associated with entering the blood vessels or heart itself.

Either type of ICD continuously monitors the heartbeat and can deliver electric shocks – defibrillating the heart when a potentially lethal rhythm problem is detected – thereby restoring a regular heart rhythm.

It's not surprising that doctors gave Colbrelli an ICD because as resuscitated SCD survivor – who was defibrillated in the field – there is no way to predict whether or not this will happen again. Subsequent events can be completely random and unpredictable. CPR alone – which Colbrelli also received at the finish line – provides some circulatory support for a SCD victim, but the only effective approach for terminating that lethal rhythm is defibrillation.

ICDs are potentially life-saving devices, but can Colbrelli race again?

Because of its high success rate, and documented improvement in survival rates, ICD implantation is considered the first-line option for treatment of subsequent SCD in resuscitation survivors.

The question that many cyclists and fans are undoubtedly asking is – why did this happen to Sonny Colbrelli – apparently so randomly – after many years and thousands of kilometers of racing with no prior issue, and indeed even with a proactive [UCI cardiac screening program](#) in place? His near-fatal collapse –

less than six months after his [highly emotional](#) Paris Roubaix win – although shocking, unfortunately represents a pretty typical storyline in these cases.

Based on information released to the media and statements generated by his team, there appears to be no obvious cause behind Colbrelli's SCD. (Specific medical details are lacking, since press releases are often given in laymen's terms — with perhaps some important details omitted due to patient confidentiality — but we know that he received care at a recognized center of excellence in Padua, implying that no stone was left unturned in his evaluation).

Without knowing the specific details, some type of hitherto unrecognized congenital structural problem is typically the culprit in young athletes like Colbrelli. Two such conditions – called hypertrophic cardiomyopathy and anomalous coronary artery origin – are the predominant causes, though a disorder known as arrhythmogenic right ventricular cardiomyopathy (ARVC) is frequently observed in individuals of Mediterranean origin.

Additional possible causes for SCD in young athletes include primary heart rhythm disorders in otherwise normal hearts (sometimes called channelopathies). Some of these inherited conditions may go completely undetected, even if the person is subjected to sophisticated screening. Sometimes, despite comprehensive testing, no specific diagnosis can be made, and the episode is termed “idiopathic”. Therefore, at least based on the available public information and the paucity of objective findings thus far, it seems that Colbrelli fits into this category.

Coronavirus, still fresh on everyone's radar, has led to speculation that Colbrelli's collapse could be related to COVID 19 – which, [as we have previously noted](#) is capable of causing serious heart issues. Colbrelli withdrew from Paris-Nice after Stage 1, reportedly due to issues stemming from “bronchitis.”

In hindsight, one could speculate that there might have been more going on here than a typical upper respiratory infection; there often can be misinterpreted symptoms prior to a significant cardiac event. But myocarditis due to COVID-19, a potentially reversible process, should be easily diagnosed by an abnormal echocardiogram or cardiac MRI scan – and a team statement said that there were “no signs of compromised heart function.”

Returning to competition following an instance of SCD is very complicated. Athletes who suffer SCD generally receive ICDs. In certain instances, if SCD occurs due to short-lived inflammation (myocarditis) or sometimes from severe electrolyte disorders, the athlete may not ultimately require an ICD. If they remain free of recurrent arrhythmias for three months after resolution of the inflammatory process, they may be considered for re-evaluation with clearance to compete.

In all other cases, where an ICD *is* implanted, participation in low-intensity sports such as golf, bowling or curling would be reasonable, if the athlete remained free of arrhythmia for three months with no ICD shocks.

The decision to compete in higher intensity sports, however, has much higher stakes, and should only be made after a thorough consideration of the fact that an ICD can deliver both *appropriate* shocks – to restore normal heart activity in the event of a life-threatening arrhythmia, and *inappropriate* ICD shocks – that can sometimes result from “normal” elevated heart rates during intense competition.

Despite the sophistication of ICDs, most are simply triggered by specific heart rate cut-off zones programmed into the device and are not “smart” enough to actually diagnose the specific heart rhythm. S-ICDs like Colbrelli's *can* actually evaluate the heart rhythm, but tend to have difficulty doing so at very high heart rates, as is typically seen in competition.

Therefore, if the heart rate is elevated for *any* other reason – even if it’s not life-threatening – the device will nonetheless deliver a shock if the programmed cut-off is exceeded. Patients say that an ICD discharge feels like getting “kicked in the chest by a mule” – so imagine the implications if Colbrelli were contesting a nerve-wracking sprint finish and was taken down to the tarmac due to an inappropriate ICD shock.

Sometimes, after a thorough discussion with family and appropriate physicians, an athlete may return to higher intensity competition, with a detailed contingency plan in place in the event that the unthinkable were to happen again. One top-flight European footballer, Christian Eriksen, who last year experienced a similar SCD, had an ICD implanted and has already [returned to action](#) – apparently successfully – in the Premier League. However, the risk profile is a little different for Colbrelli.

If Eriksen were to suffer a recurrence while on the pitch, he might collapse onto the grass; if Colbrelli experienced a recurrence while racing down the Tourmalet or mixing it up in a bunch sprint, it would be a totally different situation. Most cardiologists would thus be very nervous to “clear” his return to professional racing.

And in cycling, it’s not only the potential safety implications for Colbrelli, but for the other riders in the peloton who might also be drawn into a dangerous pileup if he were to lose consciousness mid-race. His situation is analogous to some ICD patients in the general public — such as airline pilots and commercial truck drivers —who typically must forfeit their licenses after SCD events due to public safety concerns.

Even though the public does not have access to detailed health records, Colbrelli’s case is clearly very serious. And because of his SCD event and the subsequent ICD implant, it seems likely that Colbrelli’s career in bike racing is at an end.

In addition, although the UCI has no formal policy, there is an [Italian law](#) which effectively prohibits athletes from competing in elite sports if they have an ICD – an additional barrier to his return.

“It’s already a miracle that I’m alive,” Colbrelli himself told *La Gazzetta dello Sport*, adding that “it would take another one to get me back on the saddle.”

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