

Assessing cardiovascular risk in aviation: if only we had a crystal ball!

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As healthcare professionals, we spend much of our time treating people with well-defined 'illness'. In cardiology, we are sometimes fortunate (although it may not always seem that way) to have the benefit of large randomised controlled trials, guidelines from internationally recognised organisations and expert consensus statements to guide our practice and decision-making. The assessment of people who are generally fit and well and choose to have personal health checks provides a challenge when it uncovers abnormalities that might otherwise have gone undetected. However, at least in this scenario where the choice was that of the individual, if the abnormality is one that is potentially life-threatening, then this may somehow be seen as beneficial. But the reality is that often these findings are not of a life-threatening nature and the question as to what to do next causes difficulty for many physicians being asked how to treat these individuals.

Now, apply this to individuals who have not chosen to have those health checks but have undergone them as part of an occupational screening process, where the outcome may well influence their ability to continue to practice their profession. This is even more difficult to deal with, and we start to get into the world of aviation medicine.

This brings us to the content of this supplement. While there are national and international authorities and aviation medicine experts, the reality is that many of us will come across these aircrew at some point and may be asked to assess or treat them. For cardiologists specifically, the task of assessing an individual's fitness to perform their professional duties is relatively common, if one considers professional taxi or HGV drivers. I would argue that although common, this too is not always straightforward; however, assessing fitness to fly can be even more challenging.

So where do we turn? If we have common pathology, we turn to evidence-based practice to guide our decision-making process in treating patients. However, aircrew are not patients, they are usually healthy people in whom an incidental finding has

been identified as a result of a test that they would, in clinical practice, never normally have undergone. The ECG is a perfect example; it is a helpful test for detecting illness simply, cheaply and non-invasively, when the pretest probability of finding an abnormality is high, or using the ECG to exclude an abnormality, such as in a patient with a suspected acute coronary syndrome. But when we screen healthy populations with an ECG, we detect abnormalities for which we do not have an evidence-based approach as to how then to treat them.

When this situation arises, we risk turning to anecdotal experience. While this may be appropriate for those who have years of experience, it is far from ideal. We are unlikely to get large randomised trials telling us what to do with the healthy pilot who has a PR interval of 280 ms on his annual ECG. Hence, the need for the eponymous crystal ball—a device that mystically predicts future events. In the absence of such a device, we extrapolate and use our most educated means of assessing what we think the risk is of that person having a problem at some point in time in the future, and then that problem causing incapacitation that might render them unable to perform their professional duty. We then try to quantify that risk and set it against a standard to determine in what appears to be a binary fashion whether that person is or is not fit.

Having had the privilege to work with several experts in this field and spend time discussing such matters with them, I can reassure every person who works in aviation and who might find themselves being scrutinised in this way, that nothing is further from the truth. These decisions are often the most difficult and thoughtful ones we make. There are scenarios where the decision-making is relatively straightforward and times where it is near impossible.

At the end of the day, it is the safety of all of those involved in aviation that remains paramount. There are, of course, economic pressures (the cost of training highly skilled staff and then potentially rendering them unable to perform those skills) and personal pressures (making a person unfit to undertake their livelihood, which they are trained to do, and may have done for many years). However, these decisions need to be made.

We therefore find ourselves in need of guidance and in this *Heart* supplement we have a series of articles, based on expert consensus, that provide just that. They guide us as to how we might approach aircrew who are generally fit and well but have been found to have a cardiovascular variation—not necessarily even an abnormality as such. This guidance was created, over several years, by a group of people who have extensive expertise in this field. The fact that they are predominantly from a military background means that one can certainly apply them in that arena, but their combined experience in the field of civil aviation also means that they can also be used to help with decision-making here too. All these articles have also been extensively reviewed by experts outside of the writing group, and the final documents reflect their highly valued opinions too.

Ultimately, the final decision for fitness to fly will rest with the licensing authority in question and should aviation personnel who are being subjected to scrutiny ever wish to read these documents, even if they do not understand all of the terminology, I hope they will at least appreciate how difficult this area is for all of those assessing them. Until we have a 'crystal ball' or some more robust evidence as to what to do with these specific individuals, consensus documents such as this and those before it will continue to guide practice.

Funding The author has not declared a specific grant for this research from any funding agency in the public, commercial or not-for-profit sectors.

Competing interests None declared.

Patient consent Not required.

Provenance and peer review Commissioned; internally peer reviewed.

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To cite Rajappan K. *Heart* 2019;105:s1.

Heart 2019;105:s1.
doi:10.1136/heartjnl-2018-314287

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