



DocTalk

# Doc, why am I so short of breath?

Causes vary but it is important to find out the correct one as soon as possible to provide treatment



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Every year, tens of thousands of people are brought to hospital emergency departments across Singapore because they have become increasingly distressed by shortness of breath over the preceding hours or days.

There are many reasons that lead to this; some are serious and some less threatening. They include anxiety, asthma, a chest infection, respiratory diseases such as asthma or chronic obstructive airways disease and, most seriously, heart failure.

As a damaged heart becomes weak, the person may first experience shortness of breath more quickly on exertion, such as climbing a few steps.

Later on, he may find that he is breathless when lying flat on his back at night and have to sit up for relief.

Finally, he may struggle for breath with the simplest of

activities or even when completely at rest. This reflects a build-up of fluid in the lungs because of heart failure.

It is important to pick out the correct cause of breathing problems as quickly as possible in order to provide the appropriate treatment promptly and avoid serious consequences.

Heart failure is a serious problem which can respond well to treatment if it is recognised early and managed quickly and properly. However, heart failure can be hard to recognise.

#### IS IT REALLY HEART FAILURE?

A 68-year-old man with chronic chest problems and cough with phlegm would have been vulnerable to chest infections over the years and often need courses of antibiotics to clear them.

However, he has also had high blood pressure for 10 years and is not very consistent about taking the pills for this or having his blood pressure checked regularly.

His heart then begins to fail from long-standing overload due to high blood pressure. He would become increasingly short of breath.

However, it is common for both him and his doctors to assume that it is the same old chest problem. This means his heart failure is not recognised or treated correctly for some time.

Indeed, heart failure often masquerades as a developing chest infection in someone with long-standing chronic airways disease with bronchitis and/or emphysema, or as asthma with

wheezing and cough. This uncertainty can lead to dangerous misdiagnosis and delays in correct treatment.

About one quarter of breathless patients seen at the emergency department of the National University Hospital have heart failure.

Diagnosing it may require more than asking questions about the patient's symptoms, examining him with a stethoscope, and even sending him for a chest x-ray.

In fact, reports over many years suggest emergency department doctors in most parts of the world are seriously uncertain of the presence or absence of this dangerous condition in about half of all cases.

At least that was the situation before it was discovered that hearts under stress release specific small proteins into the blood.

When we measure these proteins (known as cardiac peptides), they provide a measure of heart distress.

The higher the cardiac peptide level in the blood sample, the more likely that heart failure is present and the more serious the condition.

We have thus used the heart peptide known as NT-proBNP to develop a blood test for heart failure.

Since I discovered it in 1995, the NT-proBNP has become so well-proven as an aid for detecting heart failure with confidence that, around the world, its use is now mandated in all international guidelines on how to detect and treat heart failure.

It then leads me to ask this

question: "Is this test which was discovered and tested in Western countries any use in Asian countries?"

To find out, I launched a study with co-investigators in Singapore and New Zealand.

#### DIAGNOSTIC TEST WORKS BEST HERE

We recruited breathless patients - over 600 Singaporeans and 500 New Zealanders - from the emergency departments of both countries and found that the test actually works better here in Singapore than in New Zealand. The proof of the tests' superior performance in Asia was published in 2017.

Strikingly, using the test in Singapore provides the correct diagnosis about 15 times more often for every 100 people tested, than in New Zealand.

This is mainly because fewer "false positive" test results are found in Singapore.

The reason for this is the lower age, the better kidney function and the more normal heart rhythm of Singapore patients compared with their breathless counterparts in New Zealand.

Age, reduced kidney function and abnormal heart rhythm all affect the accuracy of the test and may give a high reading which reflects one of these background conditions rather than being true heart failure.

As to why Singaporeans with newly-diagnosed heart failure are younger than such patients in New Zealand and why they have a markedly higher rate of diabetes than their Western counterparts, we do not yet have the answers.

In the meantime, doctors and breathless patients can be confident of a diagnostic tool, the NT-proBNP blood test, which helps accelerate detection and proper management of heart failure here in Asia, even more effectively than in Western countries.

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