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link to Reader's Digest article [1]

50th anniversary Reader's Digest piece [2]

Fifty years ago, John D.Ratcliff wrote “I am Joe’s body”, one of the most successful series ever printed in Readers Digest. Calling the human body “the grandest and most complex machine ever built” he introduced readers to body parts using a unique first person narrative style. This piece is in tribute to his work, and a continuation of it.

## We are as four flowers

To imagine what we look like, picture the petals of a tightly-closed flower meeting at a middle point. Some of us have three petals, forced open by a burst of blood during a heartbeat, in much the same way as a flower bud when it bursts into bloom (though a lot more quickly). The fourth heart valve has only two petals and looks rather more like an upturned bishop’s hat, which is why I am called the ‘mitral’ valve.

## We are doors

Imagine that your heart is a two-up two-down house, with the two bedrooms being the atria of the heart (where blood is collected) and the two rather larger reception rooms being the ventricles (the pumping chambers). Two of us form the doors between the upstairs and the downstairs (rather like loft hatches); the other two are exit doors from the heart: one to the lungs and one to the rest of the body.

We are certainly not swinging doors: we slam shut once blood has passed through, keeping blood flow strictly one directional in the heart.

Nor are we slack: we open about 70 times a minute (with each heartbeat). That’s about 100,000 times a day or around 40 million times in a year.

## We are a voice

“Lub-dub, lub-dub” or “ba-boom, ba-boom”. We sing this song as the soundtrack to your life: it’s the sound as we snap shut. We work in pairs, the “lub” is when two of us separating the upper and lower chambers shut (as blood is ejected from the heart). The “dub” is when the two exit valves close to prevent blood from re-entering.

Doctors use a stethoscope to listen to our song. Our tempo is faster when you’re in love or afraid; our volume fades as life ebbs away. When our rhythm is regular and our tone like that of a gloved finger tapping a leather desk, we are a whisper of reassurance that all is well in the heart. When additional sounds are heard, they are called ‘murmurs’: mayday calls that we may be in distress.

## We tug at your heart strings

Tough protein strings anchor us to the wall of the heart. We tug at these strings when we close: they keep us from turning inside out when blood pushes against us.

## We can leave you breathless

If we are leaky or narrowed, you may not know about it unless you listen to us with a stethoscope. Trouble is, we put the heart under strain when we are faulty and this can cause tiredness, dizziness, breathlessness, an irregular heartbeat and chest pain. Drugs such as diuretics [3], nitrates [4] and beta blockers [5] may help by reducing the demands on the heart.

In the late 19th century, rheumatic fever was our greatest enemy: the infection could wreak havoc with our workings. Nowadays, damage is most likely to be genetic, acquired through ageing or after a heart attack. However, rheumatic fever is still endemic in developing countries.

## We can be replaced

On 21st September 1960, Philip Amundson received an artificial heart valve: a silicone rubber ball inside a plastic cage. When he died ten years later after falling from a ladder, the valve was still in perfect working order.

Surgeons have been long been seeking ways to replace us when faulty, whether with man-made materials or with valves from deceased humans or dead animals (valves are unique body parts in that they can be freely transplanted without fear of rejection).

When we are transplanted to a new body we can work well, but tend to be a temporary solution, lasting perhaps ten or twenty years. When made with man-made materials we can last for years but clotting of the blood and clicking [6] of the valve are common concerns. Warfarin [7] can stop the clot; some people are comforted by the clicking.

## We can be repaired

Singing our praises, and making the case for repairing us rather than replacing us, renowned cardiac surgeon Alain Carpentier said that “valve disease is only cured if you make the effort to reconstruct the valve, to restore the mobility, to reshape the orifice as it should be, as designed by God Himself”.

And how surgeons have tried to refashion us! History tells of surgeons blindly poking fingers into the beating heart to separate our fused petals; surgical instruments invented include the cardioscope (designed to look inside the heart, being the size and shape of a fountain pen and fitted with a lens and a lightbulb) and the cardiovalvulotome (a pair of cutting jaws to snip away a segment of valve).

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Valvuloplasty [8] (using a balloon to open a stiffened heart valve) and annuloplasty [9] are common repair

procedures today.

## We ask you to look after your teeth

Little things mean a lot to us. If bacteria get into your bloodstream, they can inflame the heart [10] and do us serious damage. Your mouth harbours about 400 species of bacteria, and if your teeth and gums are bad, it's easier for them to enter the blood stream. So brush twice daily - and tell your dentist if you have damaged (or artificial) heart valves because of the danger of infection.

## Value your valves

"Lie down and close your eyes. Notice the silence. Notice your heart. Still beating [hear the voice of the valves]. Still fighting. You made it, after all. You made it, another day. And you can make it one more. You're doing just fine." - Charlotte Eriksson (author and songwriter).



**Links**
[1] https://www.readersdigest.co.uk/health/wellbeing/we-are-joes-heart-valves [2] https://helencowan.co.uk/../tags/50th%20anniversary%20Reader%27s%20Digest%20piece [3] https://www.readersdigest.co.uk/health/health-conditions/all-you-need-to-know-about-diuretics [4] https://www.readersdigest.co.uk/health/health-conditions/6-things-you-need-to-know-about-your-gtn-spray [5] https://www.readersdigest.co.uk/health/health-conditions/all-you-need-to-know-about-beta-blockers [6] https://www.wsj.com/articles/SB878507399267943500 [7] https://www.readersdigest.co.uk/health/health-conditions/everything-you-need-to-know-about-warfarin-and-its-alternatives [8] https://www.hopkinsmedicine.org/healthlibrary/test_procedures/cardiovascular/valvuloplasty_92,P07990 [9] https://www.mayoclinic.org/tests-procedures/annuloplasty/gnc-20302476 [10] https://www.nhs.uk/conditions/endocarditis/causes/