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As well as being the first man to run a mile in under four minutes, Sir Roger Bannister also left a legacy in medicine, but do you know what it was?

What did Sir Roger Bannister know about medicine?

In 2005, Bannister was presented with the American Academy of Neurology's first "lifetime achievement award" for his work on the autonomic nervous system [5]. That's the part of your nervous system which does not require your conscious attention to control, but instead works automatically, helping to regulate—amongst other things—your temperature, your heart rate, your blood pressure, your breathing and your bladder.

Specifically, Sir Roger was an expert in what happens when your autonomic nervous system goes wrong and you lose control of important bodily functions. Separately, he was also a pioneer of Lifestyle Medicine [6], realising the value of a healthy lifestyle in combating illness: an undeniable throwback to his days as an athlete.

Temperature control

For his National Service as a doctor with the Royal Army Medical Corps, Bannister was posted to Yemen, where he investigated deaths triggered by heat and exercise amongst the troops. He observed soldiers collapsing after marching up mountains in the heat and he would, in his own words, "revive them and study their workload, rate of sweating, weight loss, the salt content of their sweat, and skin and deep body temperature".

Sweating [7], controlled by the autonomic nervous system, is the usual secret to cooling down when you get too hot. As sweat *evaporates*, it removes heat from the body, cooling it down. With about 3 million sweat glands, little body hair and relatively long, slim limbs, humans are particularly effective when it comes to sweating.

These soldiers were though unable to cool through sweat since the humidity was high, preventing evaporation.

Being also afflicted with possible infection, they were overheating and their lives were at risk. Bannister recommended provision of salt and water tablets, and more gradual acclimatisation [8] to the hot conditions, even experimenting on himself, letting his temperature rise dangerously in the name of research.

Blood pressure control

With every beat of your heart, your blood pressure is controlled by the autonomic nervous system, with nerves able to quickly and precisely raise or lower its value to keep it quite constant (or let it soar if you are stressed, in love [9] or about to run a race [10]). Working without instruction or much interference from your conscious mind, it's a finely tuned system.

In his important textbook [11], Bannister describes cases of autonomic failure resulting in sudden drops in blood pressure, and dizziness or fainting, after meals, exercise or even triggered by wearing a tight collar or looking upwards. A fireman complaining of dizziness after climbing ladders is described, and Bannister sought to understand the reasons behind these strange occurrences.

In 1968, Bannister set up the Autonomic Function Laboratory [12] at the National Hospital in London. Today it operates as an important centre for those with a variety of autonomic disorders.

Given the choice between making a great breakthrough in the study of the autonomic nervous system or of running the sub-four minute mile, Bannister said that he would choose the former "right away", so important was this work to him.

Lifestyle medicine

The six "pillars" of lifestyle medicine are exercise, sleep, food, stress management, quitting smoking and alcohol moderation. Today, lifestyle medicine is one of the fastest growing areas of medicine with practical advice [13] replacing pills in many prescriptions. Back in 1973, however, Bannister was ahead of his time and already calling for changes in lifestyle to improve health.

Writing in the *Lancet*, he called for doctors to extol the health benefits of exercise "instead of reaching for the prescription pad" in the fight against heart disease. He admitted that, as an athlete, he may well have had a vested interest in the promotion of sport—and indeed he did. He was the first Chairman of the British Sports Council from 1971 to 1974 and was knighted by the Queen in 1975 for services to sport, securing increased funding for sports facilities.

With heart attacks [14] set to soar as rates of diabetes continue to increase, Bannister's advice is perhaps more relevant today than at any time in history.

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