THE SCIENCE OF HEAT

Leading golf biomechanist Jean-Jacques Rivet on why you can only play your best when you are the right temperature

IN terms of the 'science of heat', it is all a question of blood. Exposed to cold, our blood tends to cool. The brain reacts by activating thermogenesis (heat production). Muscles contract, we shudder.

When arterioles of the skin constrict, the blood is diverted to the deeper tissues and the temperature rises.

Warming up is important to optimise the co-ordination. But a warm-up is not only to get all your muscles stretched, but to make them work and be ready, so there is a combination of heat and co-ordination.

That is why if you combined the compressive (co-ordination) with the heat (warm) it is ideal. You will get warm more quickly and be ready to hit. You will not be under the cold "phase" and in between shots you will heat up.

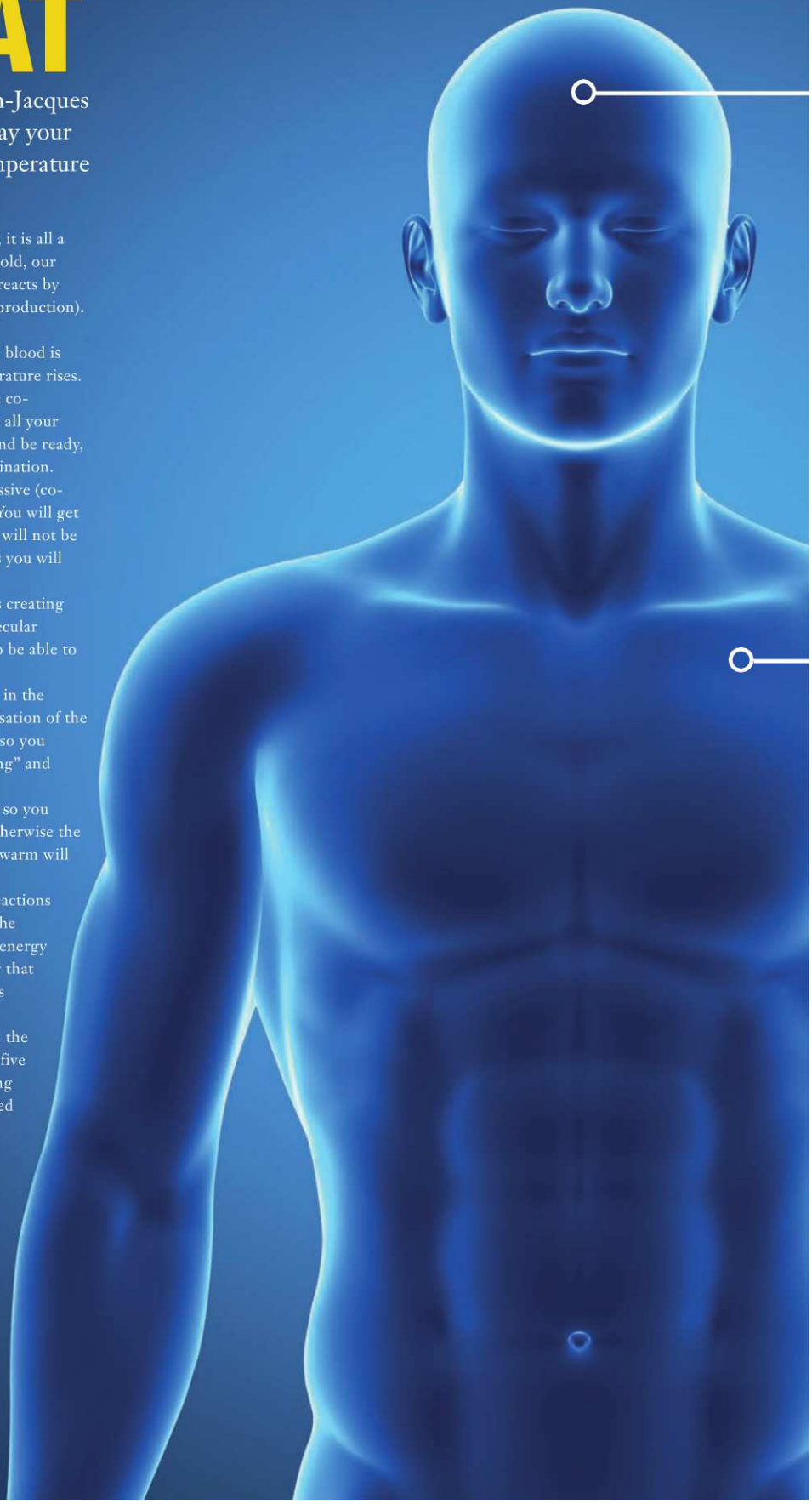
The thermic, or thermal, energy which is creating the "heat" inside the body is due to the molecular agitation of the body so you need to move to be able to have "heat" inside your body.

The muscular potential energy is created in the backswing when you optimise the synchronisation of the kinematic muscular chains around the core: so you engage even more muscles which are "moving" and increase the heat .

When it moves, your body creates heat – so you need to have clothes which keep the heat, otherwise the transfer of energy between the cold and the warm will make the temperature come down.

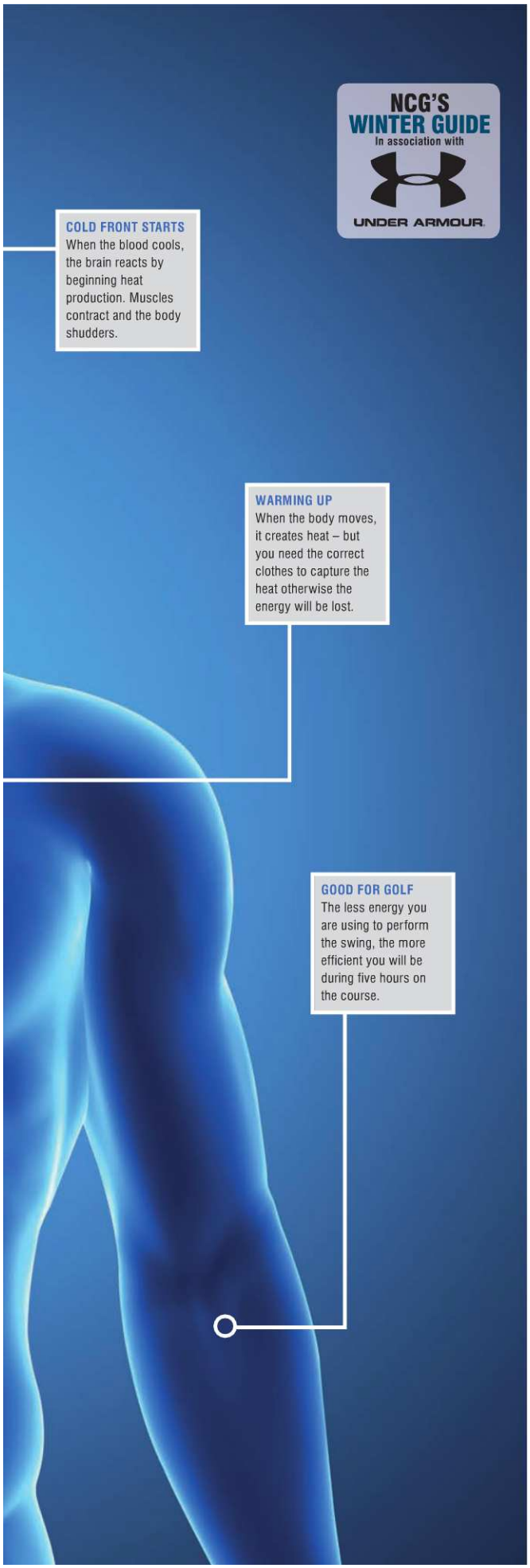
Radiation energy is emitted by nuclear reactions in the sun. This mode of transfer occurs in the presence of electromagnetic waves. Radiant energy enables an energy transfer between the body that emits radiation (source) and one that absorbs (receiver).

The less energy you are using to perform the swing, the more efficient you will be during five hours on the course. The more you are saving thermic energy, the less effort will be required by the muscles to keep warm.



ABOUT JEAN-JACQUES

JJ is a leading sports biomechanics and sports injury expert. He is the founder of the Biomecaswing Center, based at Terre Blanche GC. Clients include European Tour golfers and French Golf Federation. He oversees sport biomechanics for the European Tour and works with Under Armour on their performance apparel.



SUCCESS STORY OF UNDER ARMOUR

From Washington DC to Tottenham FC. UA's David Ayers charts their rise and rise

The origins

The brand started in American Football. Kevin Plank founded the company; he was a special teams player for the University of Maryland and he developed the first tight T-shirt. That was the first innovation; taking that fabric and putting it into a fit that has never before been used in that environment. It transformed the way a football player approached the game. It spread by word of mouth; Kevin's market was only as far as he could drive his car – he sold the shirts from his trunk. Kevin's business partner was a Lacrosse player and we have early roots there as well. The company grew in the Washington DC area, where the summers are very hot and this performance fabrication suited the environment well. Back then everyone was wearing cotton T-shirts. Kevin learned about the benefits of compression but also he knew if you were sweating the last thing you wanted was a heavy, wet cotton T-shirt. Back then, UA was all synthetic fabrications.

Under Armour in football

The Tottenham relationship has been great for us. Everything we do has to come back to the athletes. You can't sit in the office and design kits – it has to take the athlete into account. We got their team over here to spend a tonne of time to find out what they want and spend time on the biomechanics to make sure we are lining up our technologies to their needs. We were already seeing a lot of our layering on the pitch. It probably wasn't making our competition happy to see our logos popping out of collars, particularly as it got colder!

Under Armour in rugby

What a great project. The more we got close to the game and particularly Wales, we realised we have a lot more in common. Kit-wise it was open to tremendous innovations; fabrications, stretch, grip and fit . We pride ourselves on the hidden things – more stitches per inch, reinforcing seams. We innovate with materials and also construction.