Old people can’t be hot

Cardigans aren’t just old people fashion statements, there is a scientific explanation for why older humans often bundle up. Humans are warm-blooded animals that are able to regulate their body temperature without help from the external environment. Other animals like lizards need to bask in the sun in order to maintain a good body temperature and are considered cold-blooded. This may seem obvious, but there are many good reasons as to why a human would want to maintain a body temperature consistently. The regulation of body temperature, or thermoregulation, allows humans to operate daily. This means that the body can effectively break down the food it ingests, and carry the oxygen inhaled throughout the body. If a human is not within a specific range of temperature (36-37 degrees celsius), the enzymes inside the body cannot operate. Enzymes are just the mechanisms in the body that carry out these tasks. Think of it like cooking food. If the oven is not heated to the right temperature, the bread won’t rise and the chicken won’t cook. Therefore, it is important to understand how the body is capable of keeping this temperature. There are two responses when the body loses heat. The first one is to shiver. The energy that muscles can create when they move in this motion lets off heat and helps to warm the body up. The second response is where the blood vessels will constrict. This sounds odd but this actually allows the body to lose less body heat through the skin. Blood plays a big role in helping to regulate heat, and by slowing blood flow, we can mitigate heat loss. Additionally, it is known that bodies change as humans age, however it is not so clear about how the regulation of temperature changes as humans age. Whether old people are worse at shivering or if they cannot slow blood flow as well as young people is unknown.

In a study completed at Johns Hopkins, Steven Frank and his team set out to find how young and old people regulate their temperature differently. The team injected subjects with cold fluids as a way to lower body temperature with precise control. The team expected the two main responses. When humans are younger, it is quite easy to use the shivering response and the constriction response to prevent heat loss. As humans age, there are several changes in the body that could cause this. In this same study, Frank and his team set out to see what kinds of

responses were impaired with aging. Test subjects ranging from either 18-23 years of age or 58-71 were injected with cool, 4 degree celsius fluid and observed for 60 minutes to see how their temperature would manage. Shivering was assessed on a scale of 0-4 (0 being no shivering and 4 being vigorous shivering), and the constriction was assessed using a machine that detects blood flow from their fingertips (called a doppler). The results show that the older age group had a decrease in both responses, perhaps that is why they all retire to Florida.

Something else worth noting is that older humans tend to over or underestimate temperature which is probably why they always turn the heat on too high. In this same study, the researchers asked the young and old age group to rate the coldest and warmest they had been on a visual scale during the experiment. They both picked the same low and the same high temperature. This may seem like a good thing however the older group had actually been significantly colder and did not perceive this difference. This indicates that there may be impaired perception of temperature with age. “These findings contribute to our understanding of why older people are susceptible to core hypothermia during cold challenge,”(Frank et al, 2000). If older individuals cannot perceive cold as well and respond to cold as well, this presents a problem for their overall health and safety concerns.

The important takeaway is that our body is built to handle situations of cold, like the one modeled in this experiment, but our bodies are less equipped to handle extremes as we age. This helps explain why many older humans like to wear layers and are more likely to turn the thermostat up too high. Perhaps the key to living a longer healthier life lies within improving our ability to thermoregulate in old age. As Frank and his team hypothesize, the next steps in understanding this would be to investigate how exactly our bodies change as we age and this is most likely due to the change in body mass and loss of skeletal muscles. For now, focusing on long walks on the beach and the occasional jazzercise class could make all the difference in improving your responses.

1. Frank SM, Raja SN, Bulcao C, and Goldstein DS. Age-related thermoregulatory differences during core cooling in humans. *Am J Physiol Regul Integr Comp Physiol 279*: R349–R354, 2000.

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