

## AUTHOR'S REPLY

We thank Dr Hofmeister<sup>(1)</sup> for his invaluable input on near-infrared interactance (NIR) as well as his views on body mass index (BMI) and comments on our paper.<sup>(2)</sup> NIR was first used to measure the body composition of poultry, which was then extrapolated to be used on humans, as the concept of the method and the reason behind its use were fairly similar. However, studies have shown that when NIR was compared to the Gold Standard, hydrostatic weighing, it correlates poorly as compared to other methods such as bioelectrical impedance analysis and skinfold thickness measurement.<sup>(3)</sup> It has also been shown that the above three methods were not as accurate as hydrostatic weighing when used to measure the body fat of obese women, with NIR performing the poorest.<sup>(4)</sup> We chose the US Navy Formula, as it is closely related to the hydrostatic weighing results for an individual, as stated in our paper. Besides, anthropometric measurement is very cost effective and gives a fairly reasonable estimate when judging if an individual is to be classified as obese or not.

BMI has been used for a very long time, since Quetelet first came up with the formula to quantify what the norm for an individual's body weight should be with regard to their height. The medical profession has adopted that, with the assumption that it does correlate. I agree that waist circumference for men and hip circumference for women correlate well with body fat percentage (BFP), and that is why they have been used in the US Navy Formula. From a clinical point of view, the only addition here is the neck circumference and the formula to tabulate those measurements to BFP. With advancements in technology, an application for that formula can easily be made available and conveniently used on a daily basis.

From a clinical standpoint, weight plays a major role in determining the dose of drugs given to an individual. Taking into account the fact that BMI is used to judge whether a person is obese, hence affecting the efficacy of a particular drug due to its redistribution to fat and muscle tissues, how do we accurately determine the dose to be given to two individuals with the same BMI but varying body fat composition? Could this be another reason why some patients respond poorly to a particular medication as compared to others and why some patients face more side effects from a particular drug than others? Truth be told, I have yet to see an individual's body composition being taken into consideration when deciding on an effective dose of medication with maximum benefit and minimal side effects. BMI still possesses many flaws that we healthcare workers ignore due to the global acceptance of BMI.

It is certainly not possible to measure every individual's body fat, but simple methods such as the US Navy formula or even waist to hip circumference are beneficial to the population and are good screening tools for doctors. We authors still stand strongly on our views, which are based on multiple researches, that BMI, although accepted globally, is not a good tool to classify obesity from a clinical point of view. Although BMI does identify individuals who are morbidly obese, when it comes to the overweight and mildly obese individuals, it is not beneficial for demarcating where the person actually stands. Waist circumference and hip circumference are definitely much better tools.

On a personal note, as an ex-personal trainer and a practising doctor, I advise my patients to measure their waist circumference and hip circumference to keep track of their health, and not rely on weight measurement. I hope that future research will enable us to find a simple yet accurate tool to measure one's body composition. This will be a step forward in our war against obesity.

Yours sincerely,

Arvin Raj s/o Goonasegaran

Melaka Manipal Medical College, Jalan Batu Hampar, Bukit Baru, Melaka 75150, Malaysia. koli1987@gmail.com

## REFERENCES

1. Hofmeister M. Waist circumference preferable to near-infrared interactance measurements. *Singapore Med J* 2012; 53:561.
2. Goonasegaran AR, Nabila FM, Shuhada NA. Comparison of the effectiveness of body mass index and body fat percentage in defining body composition. *Singapore Med J* 2012; 53:403-8.
3. Wilmore KM, McBride PJ, Wilmore JH. Comparison of bioelectric impedance and near-infrared interactance for body composition assessment in a population of self-perceived overweight adults. *Int J Obes Relat Metab Disord* 1994; 18:375-81.
4. Heyward VH, Cook KL, Hicks VL, et al. Predictive accuracy of three field methods for estimating relative body fatness of nonobese and obese women. *Int J Sport Nutr* 1992; 2:75-86.