



house officer, registrar, and senior registrar are terms that were previously used successfully, carry meaning, make relevant distinctions, and could be reintroduced overnight.

Patients are understandably misled by the terms junior and trainee. Their confidence can be undermined by the perception that they are being treated by someone who is less than fully competent. The issue is that training terminology is being used to describe doctors' working lives. In our survey, only 18% of doctors thought that patients or the public understood the terms.

We need to rethink our terminology. Junior and trainee should be abandoned immediately, and more appropriate labels introduced—the cost of doing so would be negligible. Morale would rise and the effect would be transformational.

I declare no competing interests.

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1 Clarke R. *Your life in my hands—a junior doctor's story*. London: Metro Books, 2017.

Diet, atherosclerosis, and helminthic infection in Tsimane

In *The Lancet*, Hillard Kaplan and colleagues (March 17, p 1730)¹ noted that more than two-thirds of Tsimane adults suffer from intestinal helminths. Despite such a high inflammatory burden, the authors found a very low prevalence of coronary atherosclerosis, as measured by coronary artery calcium. Preclinical and clinical studies show that inflammation is involved in the pathogenesis of atherosclerosis and reductions in inflammatory processes could result in cardiovascular benefits. Furthermore, autoimmune diseases are associated with an increased cardiovascular risk and a worse outcome following cardiovascular events.²

Epidemiological studies have found an inverse relationship between exposure to helminth parasites and the incidence of inflammatory and autoimmune disease.^{3,4} Evidence from animal studies shows that helminth infections exert strong immunomodulatory activity and are able to inhibit, alter, and modify immune responses. Their ability to alter or suppress immune responses could be beneficial to the host through the control of excessive inflammatory responses. Animal models and preclinical trials suggest helminth infections have a beneficial effect on inflammatory diseases, and helminth therapy has been proposed as a possible treatment for autoimmune and other inflammatory disorders in human beings.^{4,5} Notably, Kaplan and colleagues¹ found that C-reactive protein was only marginally associated with the presence of coronary artery calcium, and the other inflammatory markers they measured were inversely proportional to coronary artery calcium. Rather than being considered an inflammatory risk for cardiovascular disease, helminth infection might be protective against the development of atherosclerosis. This hypothesis deserves further investigation.

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- 1 Kaplan, Thompson RC, Trumble BC, et al. Coronary atherosclerosis in indigenous South American Tsimane: a cross-sectional cohort study. *Lancet* 2017; **389**: 1730–39.
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We examined the Tsimane population at the same time as Hillard Kaplan and colleagues.^{1,2} We disagree with the authors' description of the Tsimane diet as consisting mostly of non-processed carbohydrates, high amounts of fibre, and very low amounts of simple sugars, as stated in their Article.¹

About 29% of the 349 adolescents we questioned reported consuming sugary drinks daily (88% weekly); they listed pasta, jam, sugary sweets, and other highly processed foods as part of their regular diet. These findings align with recent research on the Tsimane population, which shows that sweets are the most common food purchased (by 51% of households) and lead to obesity.³ This sugary diet explains the severely poor dental conditions of Tsimane adults we documented (appendix), and also explains the low HDL cholesterol—a predictor of cardiovascular disease risk—reported by Kaplan and colleagues.¹

Additional observations we made of Tsimane adolescents reflect a sugary diet, including dental decay (95%), dental pain (22%), difficulty sleeping because of toothaches (47%), overweight or obesity (16%), prediabetes (11%), and prehypertension (10%).² The low prevalence of coronary artery calcification¹ in Tsimane adults among these obvious signs of deteriorating Tsimane health is indeed remarkable. The low prevalence might be because adults were conceived in a pre-industrial environment,⁴ because they have not yet consumed a sugary diet for a sufficient number of decades, or because the association between coronary artery calcification and cardiovascular disease is unclear (low high-density lipoprotein, a cardiovascular disease predictor, is associated with an absence of coronary artery calcification in Tsimane people).^{1,5} Regardless, we question the highly unlikely ecological conclusions drawn by Kaplan and colleagues regarding current Tsimane diet and health.

See Online for appendix

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- 5 Shaw LJ, Narula J, Chandrasekhar Y. The never-ending story on coronary calcium: is it predictive, punitive, or protective? *J Am Coll Cardiol* 2015; **65**: 1283–85.

Authors' reply

We thank Robert H Howland, and Erin E Masterson and colleagues for their interest in our Article¹ that reported low levels of coronary artery calcium among Tsimane horticulturalists of the Bolivian Amazon. In the Article,¹ we hypothesised that, despite a high inflammatory burden, low coronary artery calcium in the Tsimane population could be due to a combination of low lifetime blood lipids, largely traditional diets, and high physical activity.

The protective role of helminths in atherosclerosis mentioned by Howland is an additional explanation that our group is currently investigating.² Helminths might have a role in modulating cardiovascular burden via caloric costs of immune activation, altered lipid and glucose metabolism, T-helper-2 cell-biased immunomodulation, and direct costs of lipophilic helminths. Among Tsimane adults, immune indicators of

helminth infection are associated with lower body-mass index, systolic blood pressure, total cholesterol, low-density lipoprotein, high-density lipoprotein, blood glucose, and triglycerides.²

Masterson and colleagues' observation that adolescent Tsimane diets include processed foods reinforces our reports that Tsimane lifestyle is rapidly changing. As noted in our Article,¹ total cholesterol and LDL have increased in recent years. Our unpublished analysis of 1404 dietary recall records indicated that, between 2011 and 2016, sugar consumption increased by six-times from 3.4 g (13.6 kcals) to 23.6 g (94.2 kcals) per adult per day. American adults consume an average of 59.8–83.8 g (239–335 kcals) processed sugar per day.³ Over the same time period, overall market food in the diet increased from 6.1% in 2011 to 10.6% by 2016. Since these changes have occurred in the past decade, older adults in our study have lived most of their lives with low exposure to circulating lipids. We hypothesise that this low exposure resulted in delayed coronary artery calcium formation.

The inclusion of processed foods in the Tsimane diet is still highly variable among Tsimane villages, and their net effect on health is unclear. Rosinger and colleagues' research⁴ cited by Masterson and colleagues focused on a younger sample of Tsimane individuals (median age in years, mid-30s) from more easily accessible Tsimane communities. Furthermore, Rosinger and colleagues⁴ did not investigate many of the remote communities (which have little access to market goods) included in our study, and they found only a 1% difference in body fat between men consuming the highest to lowest quartile of market foods. Furthermore, adult dental decay is probably caused more by poor oral hygiene and a diet high in carbohydrates (eg, rice, fermented manioc, honey), as opposed to market goods. Unpublished dental exams (n=1564) indicate that the average Tsimane adult has lost 15.2 teeth

by age 57.6 years (the mean age in our study). Thus, despite high levels of inflammation and poor dental hygiene, Tsimane individuals have little coronary artery calcium, indicating a need to re-examine these two commonly identified correlates of atherosclerosis.

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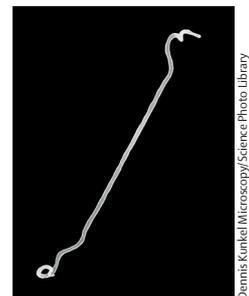
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Syphilis in children

The Seminar on syphilis by Edward W Hook 3rd (April 15, p 1550)¹ is interesting; however, it does not adequately address the disease characteristics and management in children and therefore should rather have been entitled "syphilis in adults".

Although congenital syphilis is briefly mentioned in the Seminar (and accompanying editorial),¹ details are absent about its characteristics and management, and the aspects of *Treponema pallidum* transmission



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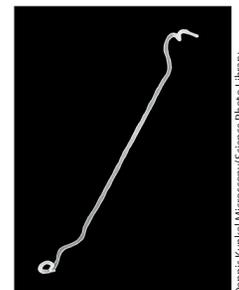
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