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IPAC Versus the Planet?

I am clearly trying to be provocative with this editorial's title. I don't mean to question the science or wisdom behind our new Infection Prevention and Control (IPAC) guidelines, but I do want us to engage in a conversation that is important to dentistry and society; namely, the amount and environmental impacts of the plastic and other solid waste produced by dental practices every day and every year.

Early discussion on this front focused on: mercury from dental amalgam waste products; silver from radiographic fixer; lead from radiographic film packets; anesthetic gases; disinfectants; monomers and associated reagents; drugs; and biomedical waste (non-sharp and sharp) (1,2). While some focus was placed on "general office waste" (e.g. paper and plastics) as well (1-3), it's not until recently that this type of waste has received more attention, given the general increase in concern over our environment.

There doesn't appear to be informationavailable for the U.S. or Canada in the academic literature, but there is for other developed and developing nations (e.g. Australia, Greece, Brazil, Iran, India) (3-8). In general, these studies note a "significant increase in the generation of dental solid waste [...] over the past decades, [which can be] attributed to the increased use of plastic barriers, gloves, and masks, which, collectively, are believed to comprise about 90% of the solid waste generated currently in dentistry clinics" (7, p. 155).

Waste from dental clinics occurs in many forms (e.g. gypsum, silicones/acrylics, alginate, masks, gloves, aprons, syringes, needles, tools, saliva ejectors, cotton/gauzes, teeth and other tissues, paper, plastic, anesthetic cartridges, etc.), and can be generally characterized as: non-combustible and combustible material; or as infectious and potentially infectious, toxic, and domestic-type waste (4,7). The amount of waste can vary, too, meaning some practices produce more waste than others, which seems logical (5,8).

In short, given the risk of global warming and climate change, and its impact on human health — and, if we believe the pundits, human viability on this planet — we cannot ignore our contribution to plastic and other solid waste.

Such concerns are even driving old and new players in the oral-hygiene industry to innovate through the introduction of toothbrush and toothpaste-tube recycling programs, or through toothbrushes that are compostable, toothpaste-like substitutes that are tubeless, and zero-waste silk floss coated in beeswax (9-12). Dentists have even monikered something in "green dentistry," which focuses on the environmental sustainability of clinical practice (13,14).

In the U.K., "green dentistry" is apparently being taken very seriously. Dentistry's carbon footprint has been estimated by the National Health Service and, in 2019, the *British Dental Journal* published a seven-paper series on the topic, providing dentists strategies for more sustainable practices (14).

In Canada and here in Ontario, we might need to focus in on this issue sooner rather than later, too, given that legislators in the province and federally are now acting to ban single-use plastics (15,16), whose use has arguably grown substantially in clinical practice over the last two decades.

Ultimately, by positioning IPAC and clinical practice more generally in this way, a clear trade-off is produced: keep the incidence of transmissible infection as low as possible and single-use packaging at a maximum, or reap the hazards of the environmental impacts associated with the waste produced in dental practice. Unfortunately, this appears to be a zero-sum game at the moment, but it doesn't have to be. A concerted effort needs to be made by policymakers, regulators, associations and, more importantly, manufacturers, to find a solution to a problem that is arguably now stressing environmental and human health. OD

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