

# Environmental sustainability and procurement: purchasing products for the dental setting

Brett Duane,<sup>1\*</sup> Darshini Ramasubbu,<sup>2</sup> Sara Harford,<sup>2</sup> Inge Steinbach,<sup>2</sup> Rachel Stancliffe,<sup>2</sup> Kim Croasdale<sup>3</sup> and Eleni Pasdeki-Clewer<sup>3</sup>

## Key points

Highlights that around one fifth of the dental footprint is embedded within the goods and services that the dental team buys.

Suggests the dental team should not consider single-use goods unless mandated through patient safety and/or legislation.

Suggests the dental profession needs to influence suppliers to become more environmentally sustainable in manufacturing, packaging, travel, recycling and reuse.

## Abstract

Sustainable procurement, when applied to dentistry, is the practice by which the dental surgery addresses environmental, social and ethical considerations when purchasing goods or services. This paper focuses on procurement and how the dental team can influence what is purchased in order to become more sustainable. It is the authors' hope that this series of papers will stimulate interest, debate and discussion and, as well as being economically responsible, ultimately motivate or inspire dentistry to be more socially and environmentally sustainable which in turn will help promote health and illness prevention.

## Introduction

Sustainable procurement is a process 'whereby organisations meet their needs for goods, services, works and utilities in a way that achieves value for money on a whole life basis in terms of generating benefits not only to the organisation, but also to society and the economy, while minimising damage to the environment.'<sup>1</sup>

Within NHS England, procurement accounted for 19% of the carbon footprint of dentistry.<sup>2</sup> Analysing and reducing our procurement, or what we buy, is an integral part of any carbon reduction strategy. This paper focuses on purchasing products for the dental setting and is written for the person who purchases equipment and stock for the practice or group of practices. The paper is also useful when considering procurement of NHS dental services by NHS England commissioners.

Sustainable procurement, when applied to dentistry, is the practice by which the dental surgery addresses environmental and social/ethical considerations when they purchase goods or services. By implementing these strategies, dental care professionals can improve their overall sustainability and, in doing so, become more socially responsible. 'Green procurement' is a process whereby public authorities meet their procurement needs by choosing solutions 'that have a reduced impact on the environment throughout their life-cycle, as compared to alternative products/solutions.'<sup>3</sup> Procurement activities that promote the use of fewer resources, and/or efficient use of resources, reduce waste and prioritise products with low carbon footprints do not need to be expensive. In fact, developing sustainable solutions can create cost savings, and environmental and health benefits.

When one looks across Europe, the healthcare sector currently has 2.8 million beds in approximately 13,000 hospitals. In providing this care, the different healthcare sectors purchase, use and dispose of a considerable amount of disposable products, building materials, pharmaceuticals and medical devices. Many of these products have components or by-products that are quite toxic to workers and patients and can have serious environmental impacts (for example hazardous

drugs, chemicals, radiation, environmental and infectious hazards, air and water pollution).<sup>4</sup>

## Ethical procurement

In addition to environmental procurement, there is the ethical component of responsible procurement to consider. There is increasing evidence that how healthcare systems purchase healthcare goods, usually via a global supply chain, may not always be ethical and that some of the products purchased are to the detriment of basic labour, safety and human rights of workers, often within the developing world.<sup>5,6</sup> For more information on ethical procurement, refer to the British Medical Association (BMA) document on fair medical trade.<sup>7</sup> Within dentistry, the BDA has published a useful guide on sustainable and ethical procurement.<sup>8</sup> There is also practical guidance for larger health and social care organisations to consider labour standards in the supplier chain.<sup>9</sup>

## Stock management

Appropriate stock management should be considered by the dental team. A hospital in Australia, for example, implemented a stock management system to provide staff with efficient access to products to deliver safe patient care in the right place, at the right

<sup>1</sup>Dublin Dental University Hospital, Department of Child and Public Dental Health, Dublin, Ireland; <sup>2</sup>Centre for Sustainable Healthcare, Cranbrook House, Oxford, UK; <sup>3</sup>Sustainable Development Unit, Victoria House, Cambridge, UK.  
Correspondence to: Brett Duane  
Email: Brett.Duane@dental.tcd.ie

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**Table 1 Suggested questionnaire for manufacturers**

Nos	Sustainability question	Score = 0	Score = 1	Score = 2
1a	Does the supplier have an approach to manage their environmental impact?	No	In progress	Yes*
1b	If no, are they willing to put one in place?	No	Unsure	Yes
2a	Can the supplier trace the product back to the original country of origin?	No		Yes
2b	If yes, please state the country of origin			
3	Are substantial amounts of activity in the supply chain undertaken where no effective labour standards legislation (or enforcement of these standards) exists?	Yes or no, and the product is produced in a country which ranks poorly on the ITUS list (see notes)	No. The product is produced in the following country_____, a country which ranks moderately on the ITUC list (see notes).	No. The product is produced in the following country_____, a country which ranks highly on the ITUC list (see notes below)
4a	Is the product content: (please tick all that apply)	None of this content		Biodegradable Recyclable Contains recycled content Reusable Remanufactured
4b	If no, is the supplier/manufacturer willing to change their product content?	No		Yes
5	Is the delivery of the product undertaken in an efficient manner to reduce emissions to the local environment?	No	Sometimes	Yes
6a	Is the product's packaging: (please tick all that apply) content/reusable/remanufactured?	No, this does not apply to this product's packaging		Biodegradable Recyclable Contains recycled content Reusable Remanufactured
6b	If no, is the supplier/manufacturer willing to change their packaging?	No		Yes
7	Would the supplier be prepared to collect all packaging from their products?	No		Yes

- 1 Generally, it is useful for a supplier to have a policy with a robust implementation plan supported by a measurement and public reporting structure. A dental practice should consider whether it has its own policy and plan first in order that it can 'practice what it preaches' (see Duane for advice.)
- 2 This question can be useful for dental practices to help them understand the environmental and social requirements within the country. There are a number of ways dental practices can consider different countries. The Environmental Performance Index ranks a country's performance in sustainability related matters.<sup>48</sup> Within this index Switzerland ranks highest, with the UK having a score of 6 and China a score of 120. Although this index is a broad-brush approach to determining the sustainability of products, countries who score highly exhibit excellent commitment to public health protection, the preservation of natural resources and reductions in greenhouse gases.
- 3 Similar to other areas of healthcare, information relating to ethical manufacturers of dental products is hard to find.<sup>49</sup> There is, however, a useful index of countries produced by the International Trade Union Confederation (2018) which ranks countries for worker's rights. This may assist dental practices when considering where they purchase products from.
- 4 The terms reduce, reuse and recycle all help to cut down on the amount of waste that is produced. The ideal product/packaging would conserve as much as possible natural resources, landfill, space and energy.<sup>50</sup> The manufacturing/packaging sector can be innovative and materials, such as biological based materials, may partially replace crude oil as an input material for plastics in the future.
- 5 The SDU's (Sustainable Development Unit) Health Outcomes of Travel Tool (HOTT) will assist organisations to measure the impact their travel has on environmental indices, including air and noise pollutions.<sup>51</sup> This can assist suppliers in helping reduce the NHS impact on the environment from travel associated emissions.
- 6 See 4
- 7 In some French supermarkets recycling bins are placed at exits with a view to encouraging consumers to remove packaging from items purchased before they leave the supermarket.<sup>52</sup> Increasingly some companies are taking back their own products to recycle or repurpose and this can include their packaging.<sup>53</sup>

time.<sup>10</sup> For economic and environmental reasons, the dental team need to ensure stock is not available for use beyond its expiry date and that they only order the amount of supplies needed. Consideration should also be given to the environmental consequences of transporting the supplies to the practice.

**Choice of products**

The types of products purchased specifically to restore teeth are all likely to have environmental consequences.

**Single-use devices**




























Many healthcare practitioners now choose, or are compelled to use, single-use devices. Some of these single-use devices, such as endodontic files, are mandatory; while others, such as disposable gowns, are chosen for convenience. Though some are medically necessary to reduce infection risks, others are not. It seems to make sense that single-use instruments, and the need to produce, package, transport and then dispose of them, would be less ecologically sound. The evidence for reusing or recycling seems to be dependent on the product and the life-cycle

assessment (LCA) undertaken (the technique used to understand how much energy, carbon and resources each product uses). Until environmental guidance in this area is available, dentists need to consider the appropriate cross-infection and decontamination guidance, for example, 'HTM-01-05: Decontamination in primary care dental practices', when choosing instruments.<sup>11</sup>

**Amalgam**

From an environmental perspective, the use of amalgam has been further restricted

Fig. 1 Action on procurement

		£		
Buy less. It's often that easy	☺☺☺	£		
Avoid where appropriate single use device	☺☺☺	££		
Choose the chemicals you use carefully	☺☺☺			
Use social media and online tools to communicate with your patients	☺☺	£		
Choose where appropriate, recyclable, reusable, products especially in your stationary items	☺☺☺	£		
Consider fairtrade type items for your grocery items	☺☺☺	££		
Choose 2-3 of your most used products and get your supplier to complete a sustainability/ethical questionnaire	☺	£		
Choose suppliers who use minimal/ environmental friendly packaging	☺	£		
Manage your stock to reduce purchasing products you don't need and may waste	☺☺	£		
Implementation:				
Easy  ... Less easy 				
Investment costs: low £ ... high £££				
Financial return on investment (ROI)				
Low  ... High 				
Environmental benefit:				
Small  ... Large 				

products online, with government buying standards available for cleaning products.<sup>19,20</sup> Alternatives include the use of vinegar, baking soda, lemon juice and plain soap.

Oral health promotion messages

From an oral health education perspective, there are a number of things a dental practice can do to reduce its environmental impact. For example, practices could consider sending emails with links to appropriate educational videos, using platforms such as YouTube,<sup>21</sup> instead of handing out leaflets and paper-based information.

Grocery items

When purchasing items from the supermarket, like tea and coffee, the dental team should consider purchasing items with social or environmental accreditation such as Fairtrade or Rainforest Alliance items.<sup>22,23</sup> Fairtrade is a governance system designed to deliver sustainable livelihoods and development opportunities to small-scale independent farmers, who often struggle to gain fair access to markets. The Fairtrade system guarantees a fair price to farmers and includes participatory governance, capacity building and long-term performance goals for buyers.<sup>24</sup>

Stationery

When the practice considers stationery, there are a number of products thought to be more environmentally sustainable and many options for a practice to implement paper reduction programmes; the WWF (World Wildlife Fund) and the UK government have useful online resources which explain this in detail.<sup>19,25</sup> Practice staff should consider carefully before they print, ensuring black and white and double-sided printing is a default and remind other staff of this. Systems which measure how many print copies per staff member can be effective and staff meetings can become paperless. Paper with non-patient identifiable information can be reused for other things, such as 'to do' notes or paper for children to draw on in the waiting room. Printing in a smaller font size and using thinner paper will not only improve environmental sustainability but also save money.

There are also significant gains to be made both by reducing procurement of paper and by preferentially purchasing recycled paper or sustainably-produced paper, such as FSC (Forest Stewardship Council) certified paper.<sup>26</sup> Only 0.08% of the paper procured for the

following European regulations, including the requirement for appropriate waste management.<sup>12</sup> Most dental practitioners are already using composite or other, perhaps more environmentally acceptable, products as alternatives to amalgam but should continue to follow the evidence behind these products too. As the American Dental Association highlights, though the utility of composite is well established, the health risks are not.<sup>13</sup> There is also environmental concern regarding composites, with their waste products entering the waste streams at various different points.<sup>14</sup>

Choice of chemicals

In the UK, COSHH (Control of Substances Hazardous to Health) regulations requires dental employers to control exposure to hazardous substances in order to prevent ill health.<sup>15</sup> According to Kaiser Permanente, there are, globally, over 80,000 different chemicals used commercially but little research into their effects on human health.<sup>16</sup> In 2011, World Health Organization (WHO) scientists reported that a significant percentage

of global deaths and disability-adjusted life years (DALYs) in 2004 could be attributed to chemicals. However, the 2011 review focused only on certain specific chemicals, and concluded that the global burden of disease was underestimated because of serious data gaps.<sup>17</sup> Large health organisations such as Kaiser Permanente are considering the chemicals they use, including alternatives in areas including detergents, solvents and disinfectants.<sup>16</sup> A review of cleaners showed a deterioration in lung function in people who cleaned domestically, with a need to prevent exposure of cleaning agents to reduce this deterioration in lung function.<sup>18</sup> Significantly more research is needed to help healthcare professionals understand which products are safe and which are less safe. Until this happens, dental teams should reduce the amount of chemicals being used and consider training staff about the chemicals that are purchased. There are often alternatives to the cleaning products we use in the non-clinical areas of dental practices. Healthcare Without Harm provides a good description of alternatives to many household

NHS through the NHS supply chain core was produced from recycled sources. The carbon dioxide equivalent emissions could have been halved if recycled paper had been purchased. Unfortunately, through the NHS supply chain and for various reasons, the price of recycled paper is twice that of non-recycled paper. Such barriers need to be removed to make this a feasible option.<sup>27,28</sup> As well as reducing the amount of paper the practice purchases, the practice should try not to buy glossy, coloured or plastic-coated paper. Patients may also prefer electronic communication to reduce paper use, although practices will need to consider General Data Protection Regulations (GDPR) when introducing these schemes.<sup>29</sup> It is possible to use electronic data interchange (EDI) technologies, such as web-based secure credit card transfers and order forms, to prevent the need for paper invoices. It is also useful to consider how the practice might reduce the amount of unsolicited mail they receive.

In addition to paper, the practice should consider more environmentally sustainable furniture and writing supplies. When purchasing wood products, for example, medium density fibreboard (MDF), furniture, or pencils, practices should ensure that the products are from forestry certification programmes. Three popular ones are the FSC, DEFRA's timber and procurement policy, and the Programme for the Endorsement of Forest Certification (PEFC).<sup>30,31</sup> When considering other writing instruments, preference should be given to reusable or refillable products, or products made from post-consumer production.<sup>32</sup> More guidance is available for office products in a government document.<sup>19</sup> If plastic stationery is purchased, make sure it has appropriate labelling to recycle it. The Mobius loop (the recycling symbol indicating that the products packaging can be recycled) should contain a specific number which identifies which plastic is used and how it can be recycled. Correction fluid used to be high in volatile organic solvents but environmental concerns have led to the development of formulae which use little or no volatile organic solvents.<sup>33</sup>

### Plastic

Using the 'reduce, reuse and recycle' model can help in the reduction of overall plastic use. Preferential purchasing by dental practices will optimistically help impact on demand, resulting in an increase in the supply of

sustainable items. Some suppliers offer refills for plastic wipe containers, allowing the large plastic containers to be reused.<sup>34</sup> Alternatives to plastic toothbrushes could be sold or promoted, for example, bamboo toothbrushes or toothbrushes with replaceable heads.<sup>35</sup>

### Recycling and packaging

The dental team should also consider how manufacturers manage both packaging and recycling, that is, do they consider the fundamental principles of 'reduce, reuse and recycle'? This might include consolidation of delivery, reusing packaging and the quality of the packaging itself.<sup>36</sup> Ideally, manufacturers should provide recycling information for medical equipment components in user manuals and/or offer to recycle the equipment they produce. Requesting such information might encourage manufacturers to manufacture products that are easily recyclable, can be upcycled, or repurposed. Some companies have programmes that take back and recycle their own equipment to ensure the disposal of all electronic products and materials are managed appropriately eg Amazon, Apple.<sup>37</sup> Recycling would in turn generate cost savings for dental practices; see waste within the dental practice, in this article series for more information.<sup>38</sup> One example in the UK is the partnership between the single-use instrument manufacturer (Robinson Healthcare Ltd) and the Healthcare Environmental Group (HEG). HEG provides practices with specifically designed sharps bins, and recycles single-use instruments back to a product able to be reused with possible financial rewards for the dental practice.<sup>39,40</sup>

### Influencing manufacturers

Globally, the dental profession needs to consider how it can influence manufacturers to become more environmentally sustainable. Activism may be a way for the dental team to influence procurement. Activism has been successful in a number of campaigns to improve working conditions; one example being the successful pressure put on Nike to change its employees' working conditions. Other successful campaigns by Greenpeace have encouraged companies such as Nike and Adidas to stop dumping toxic chemical waste into waterways.<sup>41</sup> The dental team need to question the industry regarding the sustainability of their products. The 'Green

Impact' tool encourages the dental team to engage manufacturers and communicate their sustainability, ethical and labour commitments.<sup>42</sup> In larger healthcare settings in the NHS, healthcare professionals are bound by procurement regulations, however, most dental teams are free to source from whichever supplier they choose.<sup>43</sup>

### Sustainability and ethical procurement questionnaire

In some areas of healthcare, ethical sourcing questionnaires have been developed to question manufacturers about where a product is sourced, under what conditions it has been produced, its component materials, packaging, recycling and carbon footprint. Such questionnaires have been developed in a number of fields including eye health (with a 20% response rate by suppliers in this field) and those conducted by Kaiser Permanente.<sup>44</sup> One optometrist publishes his suppliers' questionnaire responses on his website in order to allow consumers to make an informed choice when selecting their eyewear.<sup>45</sup> If dental practices consider using only companies who provide sustainable and ethical products, a significant change could result. Practices could also set up form buying cooperatives with other practices in order to increase their influence in this process. The following questionnaire (Table 1) has been designed for dental practices to help them consider the sustainability of simple products that are frequently used such as gloves, paper bibs, local anaesthetic supplies, and steel (or equivalent burs). The vision is that a large quantity of dental products would be produced sustainably and ethically, and that the dental team have the knowledge to be able to demand ethical and sustainable products. A scoring system is also suggested to rank viable alternatives. Products which score more highly on this table could be prioritised against others.

It is understood that a number of larger dental suppliers, and certainly NHS England, procure items via tender. Procurement consists of a series of stages including planning, supplier sourcing, preparation of documents, invitation to tender, evaluation and contract management. There are opportunities to influence each stage of the procurement process, however, the most significant opportunities for sustainable procurement are in the earliest stages of the process, when the type of product is identified and defined. At this stage, it is important to ensure there are environmental and social criteria built into

the purchasing process. Within the planning stage, the specification should be detailed and include technical environmental specifications, with minimum standards set for inclusion or exclusion of a tender. When the supplier is selected, the evaluation criteria need to include, for example, those listed in the questionnaire within this paper. As part of the evaluation process these elements all need to be weighted. The social value calculator can assist procurers and commissioners to determine the value of social contributions made through contracts, for example, creating jobs or apprenticeships.<sup>46</sup>

## Influencing commissioners of NHS dental services

The majority of NHS England dentistry is commissioned directly by NHS England, with English oral health promotion and epidemiology commissioned by the relevant local authorities. The Public Services (Social Value) Act 2012 requires public authorities such as NHS England commissioners and local authorities to 'have regard to economic, social and environmental well-being in connection with public services contracts'.<sup>47</sup> Under the act, the authority must consider how the dental services that are being procured might improve the economic, social and environmental well-being of the relevant area, and how in procuring dental services it might act to secure that improvement. As part of the procurement of dental services, commissioners use Public Health England advice to ensure the economic and social well-being of the area is considered, using health impact assessments; however, there is very little work undertaken to understand the environmental consequences of commissioning in dentistry. It is recommended that all NHS commissioners of dentistry are trained to understand the impact dentistry has on the environment and how to commission services appropriately.

## Action points

The following action box (Fig. 1) provides some summary for readers to consider to improve the environmental sustainability of their procurement. The reader should be advised that the judgement of ease, cost and impact is subjective, and more evidence is needed.

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