**Enhancing Sustainability in Endoscopy: Findings from a Waste Reduction Feasibility Study**

Background:

The NHS in UK aims to reduce carbon emissions by 80% before 2028. This study, conducted in Queen Alexandra Hospital’s Endoscopy Department (UK), evaluated waste generation during endoscopy procedures and explored methods for improvement.

Methods:

A total of 52 gastroscopies (OGD), were observed and the impact in terms of CO2 estimation and quantity of water used was calculated per standard endoscopic list (~10 patients). Based on these findings, an educational intervention was created to increase the awareness and instruct the staff about the correct waste differentiation. Impact of this intervention was then prospectively measured.

Results:

The carbon footprint of a standard endoscopy list was estimated based on the CO2 produced during manufacturing and transportation of the endoscopy consumables (including endoscopic devices and medical equipment), the cleaning process and electricity used by the medical equipment.

The water used for the cleaning process per 10 patients was estimated ~659.500 L and the electrical power consumption was ~52000 kWh. The estimated CO2 production for 10 Gastroscopy procedures is ~10. 6 kg. Moreover, medical devices are manufactured mainly outside of EU resulting in around 120 tonnes of CO2 produced per 500kg of medical devices transported to UK.

Additionally, an inaccurate waste differentiation was observed with a total of 15.6 kg/10 patients of waste disposed in clinical waste bags and processed with incineration and only 0.45kg/10 patients of waste disposed in recyclable waste bag. The educational intervention focused on the correct classification of the waste and the recognition of recyclable waste. Small changes in the room setting were also made including the location and type of bins available with the introduction of the dual-bin system. The waste in clinical bags was decreased from 15.6 kg to 9.5 kg per room per list, saving 6.1 kg per list of recyclable material from being incinerated and £ 1281 per list. This equates to 610 gm per endoscopy procedure at a cost of £ 128.00 per procedure. The same has been estimated in 1 year on a local and national scale considering ~7200 procedures/year in our center and 2.133.541 in UK (data from JAG 2019 / pre-pandemic numbers). This shift represents an annual departmental saving of approximately 4.45 tonnes of recyclable material being wrongly incinerated. This can result in a saving of £ 934,000.00 in processing costs. Scaled nationally, this simple approach alone could save 1.28 million tonnes of recyclable waste at a cost of £276 million annually.

Conclusions:

Our data demonstrates that a simple procedure like diagnostic Gastroscopy is associated with significant carbon footprint even without taking disinfection into account. Encouragingly, we also demonstrate that a sinple intervention and education can have a significant impact on the carbon footprint of endoscopy and also result in significant cost saving,