

# ENVIRONMENTALLY SUSTAINABLE SKIN SURGERY: STAFF PERCEPTION, ATTITUDE AND PRACTICES AT A DERMATOLOGY DEPARTMENT IN THE UNITED KINGDOM

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## ABSTRACT

*Introduction:* The National Health Service (NHS) has set the goal of reaching net zero emissions by 2040. Within dermatology, minor skin surgery is particularly energy- and resource-intensive. As we approach the 1-year mark since the publication of the British Society for Dermatological Surgery (BSDS) sustainability guidance 2022, there is a need to assess dermatology staff's awareness, attitudes and practice towards environmentally sustainable minor skin surgery.

*Methods:* A single-centre service evaluation study was conducted at South Warwickshire University NHS Foundation Trust (SWFT). A 12-question structured questionnaire was distributed to all medical and nursing staff that undertake skin surgery (n = 14 medical and n = 5 nursing staff) between 10 and 21 July 2023, with a response rate of 11 out of 19 (58%). The skin surgery waste disposal practices were evaluated between 14 June and 11 July 2023 where the weights of waste generated from seven skin surgery lists (each lasting 4 h) involving a total of 29 procedures were evaluated using a digital scale accurate to the nearest 100 g.

*Results:* Out of 11 respondents, 9 (82%) stated that they were aware of the BSDS sustainability guidance 2022, but only 4 (36%) respondents had read the guidance. Seven (64%) stated that they used absorbable and non-absorbable sutures for surface wound closure, whereas 4 (36%) respondents stated that they exclusively used non-absorbable sutures for surface wound closure. Eight (73%) stated that they exclusively used sterile gloves for skin surgery, and 3 (27%) stated using a mixture of sterile and non-sterile nitrile gloves depending on the situation. In the free text responses, 8 (73%) respondents stated they exclusively used sterile gloves for all skin surgery procedures, and 3 (27%) stated using both sterile and non-sterile nitrile gloves depending on the

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situation. Waste generated per procedure averaged 0.54 kg (0.05 kg sharps waste, 0.36 kg clinical waste, and 0.13 kg recycling waste). The recycling rate averaged 24.0%.

*Conclusions:* Our study identified a high level of awareness of the BSDS sustainability guidance, but few had actually read the guidance itself. Staff is engaging with recycling of waste from minor skin surgery. Staff education on National Institute for Health and Care Excellence (NICE) guidance on hand disinfection in minor procedures and the BSDS sustainability guidance could further promote staff transition into more environmentally sustainable minor skin surgery practices.

**Keywords:** sustainability, skin surgery, waste disposal, recycling

## INTRODUCTION

The National Health Service (NHS) comprises an estimated 4% of total United Kingdom (UK) carbon emissions. The NHS has made a commitment to improve its environmental sustainability and set the goal of reaching net zero emissions (direct emissions) by 2040 (NHS England, 2022). Both regulatory and professional guidance (Ali et al., 2022; General Medical Council, 2023) promote engagement with environmental sustainability in our role as medical professionals. Within dermatology, minor skin surgery is an area considered to be particularly energy- and resource-intensive. The British Society for Dermatological Surgery (BSDS) published its first sustainability guidance for minor skin surgery in 2022, providing much-needed evidence-based recommendations on green transformation of skin surgery with an emphasis on preventive measures and promoting low-carbon alternatives (Ali et al., 2022). As we approach the 1-year mark since the publication of this guidance, there is a need to assess dermatology staff's awareness, attitudes and practices towards environmentally sustainable minor skin surgery.

## METHODS

This is a single-centre, registered service evaluation study carried out at the dermatology department at the South Warwickshire University Hospital NHS Foundation Trust (SWFT), UK.

A 12-question structured questionnaire was piloted, tested for its face validity with two dermatology doctors and then further refined prior to distribution to all medical and nursing staff that undertake skin surgery at SWFT (total staff number = 19; 14 medical and 5 nursing staff) between 10 and 21 July 2023.

The skin surgery waste disposal practice was evaluated between 14 June 2023 and 11 July 2023 where the weights of waste generated from seven

minor skin surgery lists (each list lasting up to 4 h; outpatient lists only and excluding day surgery lists; all procedures performed under local anaesthetic; no Mohs' micrographic surgery included in the list) involving a total of 29 procedures were evaluated using a hospital calibrated digital scale accurate to the nearest 100 g. Data were analysed using Microsoft Excel. Descriptive statistics such as mean and range were reported. Free text response from the questionnaire was analysed using descriptive thematic analysis (Braun and Clarke, 2006).

## RESULTS

### *QUESTIONNAIRE RESULTS*

The questionnaire response rate was 58% (11/19). Table 1 shows the demographics of questionnaire respondents.

Out of 11 respondents, 9 (82%) stated that they were aware of the BSDS sustainability guidance 2022, but only 4 (36%) respondents had read the guidance.

Seven (64%) stated that they used absorbable and non-absorbable sutures for surface wound closure, whereas 4 (36%) respondents stated that they exclusively used non-absorbable sutures for surface wound closure. Respondents provided free text responses about the use of absorbable sutures for surface wound closure. Respondents stated patient factors such as patients going away on a holiday, housebound patients or those with difficulty travelling were potential reasons for selecting absorbable sutures for surface wound closure. Respondents reported absorbable sutures as surface wound closure would be used on all body sites and on a wide range of procedures including punch, incision and excision biopsies.

On personal protective equipment (PPE) use, for eye protection, 6 (55%) reported they wore spectacles, 2 (18%) stated using reusable eye protection, 1 (9%) stated using used single-use eye/face shield and 3 (27%) stated that they do not routinely use eye protection. For hair protection, 3 (27%) stated

**Table 1. Demographics of respondents**

<b>Job Role</b>	<b>Number of Respondents</b>
Consultant	2
Registrar	3
IMT	1
GPST	2
Specialty Nurse	3

that they used single-use hairnet, and 8 (73%) stated no routine hairnet use. For face protection, 1 (9%) stated using reusable face masks, 9 (82%) stated using single-use face masks and 1 (9%) stated no routine use of face masks. For aprons and gowns, 10 (91%) stated wearing single-use plastic aprons and 1 (9%) reported using single-use surgical gowns. For gloves, 8 (73%) stated that they exclusively used sterile gloves for skin surgery, and 3 (27%) stated using a mixture of sterile and non-sterile nitrile gloves depending on the situation. In the free text responses, 8 (73%) respondents stated they exclusively used sterile gloves for all skin surgery procedures, and 3 (27%) stated using both sterile and non-sterile nitrile gloves depending on the situation.

Seven (64%) reported disposing of surplus local anaesthetic liquid already drawn up in a syringe into a sharps bin, 2 (18%) reported disposing of it in the orange clinical waste bin and 2 (18%) reported disposing of the liquid down the surgical sink.

Two (18%) reported using reusable skin surgery equipment only, and 9 (82%) reported using a mixture of single-use and reusable skin surgical equipment.

On hand washing, 2 (18%) respondents stated that they exclusively followed the National Institute for Clinical Excellence (NICE) guidelines for hand disinfection (i.e., disinfecting hands with soap and water before the first procedure and when the hands are visibly soiled; using alcohol gels in-between cases), 8 (73%) stated that they mostly disinfect their hands using soap and water and 1 (9%) stated mostly using alcohol gel.

### *MINOR SKIN SURGERY WASTE DISPOSAL PRACTICE*

Twenty-nine procedures (including excisions with direct closure, incisions, curette and cautery, shave and punch biopsies) generated a total of 15.7 kg of waste disposed into waste bins within the procedure room (1.53 kg shapes waste, 10.4 kg clinical waste, and 3.8 kg recycling waste). Waste generated per procedure averaged 0.54 kg (0.05 kg sharps waste, 0.36 kg clinical waste and 0.13 kg recycling waste). The recycling rate averaged 24.0%. There is no general waste bin in the procedure rooms.

## **DISCUSSION**

Findings from our single-centre study indicated a high level of awareness of the BSDS sustainability guidance 2022 among dermatology staff involved in minor skin surgery. One of the consultants at the study site is an advocate of environmentally sustainable skin surgery and this could potentially impact local awareness and engagement with the BSDS sustainability guidance. Indeed, a third of the questionnaire respondents stated that they had actually read the guidance, which highlighted the need for further efforts to publicise and educate staff about the guidance.

In contrast to the BSDS sustainability guidance which recommended the routine use of absorbable sutures in preference to non-absorbable sutures if deemed appropriate for surface wound closure, only a minority of respondents in our study stated that they exclusively use absorbable sutures for wound surface closure. Potential explanations could include a lack of awareness of the guidance, perceived infection control concerns and practitioner preference. Staff transition to using absorbable sutures for wound surface closure could potentially reduce the carbon footprint from patients travelling to healthcare facilities for the removal of non-absorbable sutures.

Respondents reported using a range of reusable and single-use PPE. We would encourage staff to transition to BSDS sustainability guidance and use reusable PPE when appropriate, such as using home-laundried reusable surgical cloth caps and cotton face masks (Ali et al., 2022).

Majority of study respondents reported exclusive use of sterile gloves for all minor skin surgery and expressed a preference for the use of sterile gloves over non-sterile gloves for performing procedures. The BSDS sustainability guidance had considered the literature on surgical site infection rate for minor skin surgery performed with sterile gloves and non-sterile gloves in different settings and encouraged staff to consider using non-sterile gloves in diagnostic biopsies, curettage and simple excisions when appropriate (Ali et al., 2022; Brewer et al., 2016; Rietz et al., 2015). Potential explanation towards respondents' preference for using sterile gloves could include local infection control policies, their valid concerns about surgical site infection rate and lack of awareness of the evidence from the sustainability guidance.

Our study identified the weight of waste generated per procedure as 0.54 kg and a waste recycling rate of 24.0%. This was compared unfavourable against the mean waste generated per procedure of 0.52 kg but favourable against the recycling rate of 16% in a UK-wide 12-site study examining skin surgery waste disposal practices (Shearman et al., 2023). The UK-wide study considered Mohs micrographic surgery and procedures carried out in day surgery unit. Despite being in the outpatient setting, our study was associated with a higher volume of waste generated per procedure. Our site lacked access to a general waste bin, and the introduction of a general waste bin in skin surgery procedure rooms could potentially reduce the amount of waste disposed as clinical waste (which has a higher carbon footprint than general waste).

This single-centre study had limitations. It has a small sample size and our findings could not be generalised to other centres. The use of a more accurate calibrated weighing scale (e.g., accurate to the nearest 1 g) could improve the accuracy of our calculation of the weight of waste and recycling rate. Future larger-scale studies could explore staff perception and engagement with environmentally sustainable skin surgery and the BSDS sustainability guidance.

## CONCLUSION

Our study identified a high level of awareness of the BSDS sustainability guidance, but few had actually read the guidance itself. Staff is engaging with recycling of waste from minor skin surgery and most used reusable PPE. Staff education on NICE guidance on hand disinfection in minor procedures and the BSDS sustainability guidance could further promote staff transition into more environmentally sustainable minor skin surgery practices.

## ETHICS AND CONSENT TO PARTICIPATE

This study was registered and assessed by the audit and clinical effectiveness department.

## COMPETING OF INTEREST

The author declares that they have no competing interests.

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