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International survey on surgeon's attitudes and perceptions of surgical wound complications: navigating the challenges

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Abstract

Introduction: Surgical wound complications (SWCs), including surgical site infections (SSIs) and wound dehiscence (SWD), significantly impact postoperative recovery, contributing to morbidity and reduced quality of life. The prevalence of SSIs ranges from 2% to 38%, with higher rates in low-resource settings. This study explores surgeons' perceptions of SWCs, prevention protocols, and the use of advanced therapies such as negative pressure wound therapy (NPWT).

Methods: An online survey of surgeons from Europe and the UK was conducted to examine their experiences with surgical wound management. The 36-question survey included topics such as SWC prevention strategies, dressing selection criteria, and the application of NPWT. Respondents ranked challenges in surgical care and reflected on responsibilities for postoperative wound care tasks. Quantitative data were collected through closed- and open-ended questions.

Results: From 244 respondents, over 55% of respondents identified SWCs as a top challenge, followed by resource constraints (41%) and antimicrobial resistance (36%). Respondents indicated that surgeons are primarily responsible for SWC risk assessment (80%), while nurses often handle dressing applications (62%). 24% of surgeons identified SWC as a primary challenged and 16% reported a lack of professional training for wound care as a top 10 challenge. NPWT was used by 91% of respondents, with 68% citing faster wound healing as the primary factor for its use. Hospital protocols were the most common influence on dressing selection, with only 21% referring to international guidelines.

Discussion: These findings highlight key challenges in the surgical arena related to the clinical management of incisional wounds. Additionally, a gap in wound care education within the medical domain was identified, highlighting an educational deficit and creating an opportunity for the development of enhanced medical training and education focused on skin integrity and wound care. The results indicate that the delivery of surgical wound care relies on a multidisciplinary approach, emphasising the need for collaboration across healthcare professionals.

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Introduction

While most surgeries are safe, surgical wound complications (SWCs) compromise recovery and delay return to normal activities, impacting physical, emotional, and financial well-being[1, 2, 3, 4]. SWCs, such as surgical site infection (SSI) and surgical wound dehiscence (SWD), can occur after any procedure, disrupting healing through skin flora or external contamination[5-7]. SSI prevalence ranges from 2% to 38%, with higher rates in low-resource settings[8-11]. Postoperative mortality accounts for 7.7% of global deaths, primarily from circulatory failure, failure to rescue, and sepsis[10,12]. Chronic diseases and cancer increase SWC risks, delaying or canceling therapies and impacting oncological outcomes [13-17].

Clinical management of SWCs engages a team-based approach including surgeons, acute and community nurses, infection control specialists, and primary health care physicians[18, 19]. Surgeons play a crucial role in patients' surgical journeys and are traditionally responsible for governance and care decisions within a team [20-22]. Often, SWC care involves nursing interventions requiring specialist wound care supported by evidence-based practice[23]. Central to this is regular education on advances in wound healing, including interactive dressings and negative pressure wound therapy (NPWT) [24-26]. There is considerable debate about NPWT for surgical wounds, with studies showing conflicting evidence for SSI prevention [27-35]. Despite ongoing research, NPWT is widely used in clinical practice, with approaches differing by discipline and surgeon preference[36]. Surgeons' perceptions of factors influencing NPWT use remain to be elucidated. Continual professional education is needed not only for nursing and allied health teams but also for medical and surgical disciplines regarding wound care and advanced healing modalities. Medical education on skin integrity and wound healing after surgery is critical for improved outcomes[37, 38]. Understanding contemporary challenges faced by surgeons in this area is central to improving education and patient outcomes.

Methods

Quantitative methodology

An electronic survey investigating surgeons' perceptions regarding surgical wound management was conducted between 16th August and 7th September 2023. Survey participants were identified and recruited from Sermo ® online healthcare professionals from Europe and UK, who have opted in to taking part in surveys for market research. The survey was an online self-completion survey, which took approximately 20 minutes to complete. Due to the nature of a market-based survey, the survey used was non validated and was not piloted. Furthermore, no restrictions were placed to reduce survey bias. The market research was commissioned by Smith & Nephew and conducted by The Nursery Research and Planning Ltd, London, UK. The survey was completed in a digital format via a web browser on a desktop or mobile device. Survey respondents were asked a total of 36 questions regarding their perceptions about surgical wound complications and some of the key contemporary challenges facing healthcare institutions and professionals. The question formats included a combination of either open (free text) or close ended (Y/N), a scale/ranking for choices and free text options where applicable.

Prevention protocols and surgical care bundles

Survey participants were asked to rank the 5 most important challenge in their role according to their experience (1being the most important and 5 being least important) out of 11 choices (table 1). Following initial screening, survey respondents were asked to consider their responses with reference to non-emergency (elective only) procedures and closed incisions for primary intentional healing. Open wounds and wounds healing by secondary intention were excluded from consideration during all survey responses. The survey questions considered several different topics regarding surgical wound management. Topics included the use of risk management protocols for prevention of surgical site infection (local, hospital, international guidelines), the use of surveillance following discharge, dressing selection and responsibilities for tasks regarding post operative wound care. Respondents were asked to rank according

Table 1. Top 5 perceived challenges in contemporary surgical practice

Rank in Order (1-5, 1 most important, 5 least important)
SSI and SWD
Obesity and impact on patients
Increase in digital technologies in surgery
Lack of professional training for fellows in wound care
Waiting lists
Lack of access to latest technology and products
Antimicrobial resistance
Constrained resources (staff & budgets)
Awareness of protocols for prevention and management
Inconsistencies in acute wound care practice
Sepsis

Table 2. Survey respondents demographics

Country	Number of respondents
UK	61
France	61
Germany	61
Spain	61
Total	244

to a scale on their perception on prevention strategies for surgical site infection (0 being little attention to 10 being extra attention).

Table 3. Surgical specialty of respondents

Specialty	N
Orthopaedic*	42
Cardiac	40
Vascular	40
Plastic / Breast	36
Colorectal / Digestive**	46
Obstetrics and Gynaecology	40
Total	244

*Includes trauma **Includes bariatric and general surgery

Further to this survey respondents were asked to select which protocols they use in clinical practice for prevention of surgical site infection. Respondents were able to choose all that applies in their practice: peak body guidelines for speciality; hospital defined protocols; Enhanced Recovery After Surgery (ERAS) protocols; surgical association guidelines; nursing association guidelines; no specific protocol/guideline.

Further questions also explored the use of advanced dressings and the processes regarding decision making on dressing selections. Respondents were asked to reflect on factors relating to decisions regarding dressing selection and were able to select from; hospital protocol, patient experience or international/national guideline/s. Survey respondents were also asked to provide their perception on the allocation of specific tasks regarding post operative care. This included the following: patient risk profile assessment; decision on type of dressing to use; application of dressing; monitoring healing; management of exudate; diagnosis of wound complication; clinical management of complication; patient follow-up. Respondents could choose from the following: me (survey respondent); another surgeon; operating room nurse/surgical nurse; specialist wound care nurse; hospital nurse/other nurse; outpatient department; primary care; district/community nursing; not sure; not applicable. Survey participants were asked whether post discharge surveillance is used in their setting (Y/N).

Advanced wound dressings

There is a plethora of advanced wound dressings available, with a considerable range of features and benefits and indications for use. Advanced wound dressings use differing modalities that provide unique benefits to wound healing. These characteristics derive from the materials and methods used to construct the dressing, impregnated agents into the fabric such as silver, bioactive dressings the features of the dressing such as antimicrobial, antibacterial, bacterial sequestration, absorptive capacity, moisture vapour transmission rate and devices such as negative pressure wound therapy. The use of wound dressings after surgery serves not only to protect the incision from contamination and manage any fluid such as bleeding, but to provide an optimal environment conducive to incisional healing [38,39]. Despite the variety of the types of advanced dressings available for incisional wounds, there is discourse among surgeons regarding their use and ideal properties for incision care [38,40,41].Moreover the evidence base for the use of advanced dressings compared to standard dressings to prevent SWCs after surgery remains in deficit [29,42].

Factors influencing decision making

Survey respondents were asked to reflect on factors influencing their decision-making regarding dressing selection for closed incisions. Respondents were asked to select from a range of options regarding considerations when selecting a dressing. Respondents were able to select from a range of factors: hospital protocols, patient experience, national and/or international guidelines. Respondents were asked to provide their perception of the use of negative pressure wound therapy (NPWT) in clinical practice, their decision process regarding its use, and whether they use NPWT as a preventative measure for incisional wound complications. Survey participants were asked whether they used disposable single negative pressure wound therapy (sNPWT) or traditional or non-disposable negative pressure wound therapy (tNPWT) and the factors influencing their decision making regarding this therapy. Survey participants were also asked to reflect upon their anecdotal experience regarding primary reasons for selecting NPWT for incisional wounds. Respondents were able to select from the following; faster wound healing; improve exudate management; prevent SSI; prevent SWCs; prevent seroma; prevent local skin issues; reduced burden for patient; reduced occurrence of scarring.

Table 4. Top 8 challenges rankings

Challenge (Rank)	Frequency (n=244)
Surgical wound complications (1)	55
Constrained resources (2)	41
Antimicrobial resistance (3)	36
Obesity (4)	34
Waiting lists (5)	30
Inconsistencies in care (6)	28
Sepsis (7)	18
Lack of professional wound care training for fellows (8)	16

Results

A total of 244 respondents completed the questionnaire (Table 2) and were surveyed to explore attitudes and perceptions regarding surgical wound care. A range of surgical specialities consented to participate in the survey and included obstetrics, orthopaedics and colorectal specialties (Table 3). Survey respondents were asked to select from 11 choices and rank their top five challenges in clinical practice (Table 4).

Over half (55%) of the respondents ranked SSI and SWD as the top challenge followed by resource constraints (41%) and antimicrobial resistance (36%) as key contemporary issues in practice. Respondents were asked to reflect on the use of infection prevention protocols in practice (Table 5).

Table 5. Perceptions on infection prevention protocols

Choice	% (N=244)
Protocols generally work well	36
Protocols are easy to implement	30
Protocols could be improved	32
Protocols require constant updating	55

Over half of the respondents agreed that protocols require constant updating whilst 30% perceived they are easy to implement. Respondents were asked to rank in order of priority what they perceived as the most significant consequence of surgical wound complications (Table 6). Fifty eight percent responded reduced quality of life for patients as a major consequence. Negative patient experience ranked second (39%). The least ranking consequence was increased burden for patient caregivers (30%).

Survey respondents were their perceptions regarding responsibility for tasks and decisions relating to postoperative wound care (Figure 1). Respondents were asked to select whether attending surgeon or nurse is responsible for delivery of a range of task specific interventions relating to incision care.

Respondents chose from one of two options: surgeon or nurse, who carried out tasks related to incision care after surgery. Over 80% of respondents perceived that surgeons are responsible for risk assessment, while 22% of respondents perceived that nurses are responsible for SWC risk assessment. Sixty-two of respondents perceived that nurses are responsible for dressing applications, whereas 80% of respondents perceived that surgeons are responsible for decisions regarding dressing selection.

Participants were asked to select from a choice of three factors regarding decision making in dressing selection (Table 7). A total of 232 responses were recorded (95% response rate), with over 50% participants in Germany and Spain choosing hospital protocols as a driver in decision making. Forty percent of the respondents reported the use of international or national guidelines as a factor in the decision process with 18% of UK respondents opting for this factor. Resource constraints were only reported for 8% (n=20) of the sample.

Table 6. Ranking of consequences of SWCs

Consequence of SWCs (ranking)	(%)
Reduced quality of life (1)	58
Negative patient experience (2)	39
Increased patient mortality (3)	35
Increased time and resources (4)	34
Risk of antimicrobial resistance (5)	34
Increased burden for patient caregivers (6)	30

Use of NPWT

Survey respondents were asked whether they use NPWT as part of routine practice after surgery. A total of 223 (91%) from the sample reported they use NPWT in clinical practice. Of the 244, a total of 168 respondents (68%) reflected on their use of NPWT for incision care. Survey participants were able to select whether they used single use or traditional negative pressure wound therapy in their clinical practice. A total 168 respondents (75%) reported they used disposable single use devices, whereas 91% reported using traditional (non-disposable) NPWT devices.

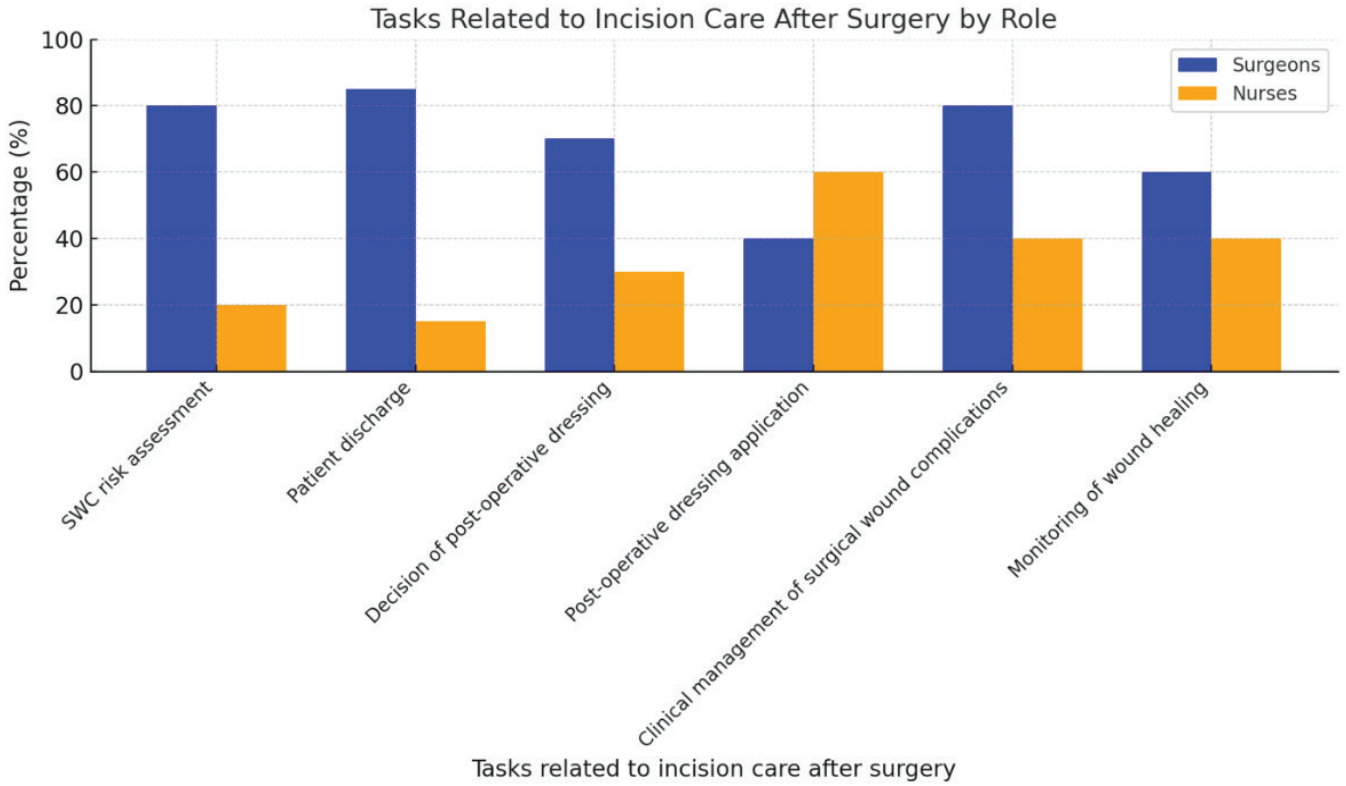
Respondents were also asked whether they used NPWT in treatment of SWCs. A total of 192 (78%) reported they use NPWT for management of SWCs. Furthermore, 66% (n=112) reported their perceptions of criteria their base their decisions for sNPWT use (Table 8). Respondents were able to select more than one criterion in response to this question.

A total of 168 respondents selected criteria

Table 7. Factors influencing postoperative dressing selection

Factor	UK	France	Germany	Spain
Hospital protocols	23 (38%)	25 (41%)	32 (52%)	33 (54%)
Patient experience	15 (26%)	16 (26%)	14 (23%)	3 (5%)
National/international guidelines	11 (18%)	12 (20%)	12 (20%)	16 (26%)
Resource constraints	9 (15%)	5 (8%)	0 (0%)	6 (10%)

Figure 1. Surgeon's perceptions on responsibility of tasks related to incision care



for decision making regarding sNPWT, selections included more than one choice of factors. A portion of respondents (37%) reported the ease of use as a primary criterion for using sNPWT. Protection from contamination was the second most frequently chosen criterion for the use of sNPWT and the third was evidenced based outcomes (35%). Survey participants were asked to reflect on the primary reason/s for using NPWT in relation to incision care. A total 168 respondents chose from a number of factors regarding decision making in choosing NPWT as an advanced wound therapy (Figure 2).

Of the 168 respondent who report using NPWT for incision care, 68% chose faster wound healing as a factor in selecting NPWT. Exudate management and prevention of SSI ranked second and third respectively. Reduced patients burden was a factor for 21% of respondents and reduced scarring was a factor for 14% respondents.

Table 8. Criteria for use of sNPWT

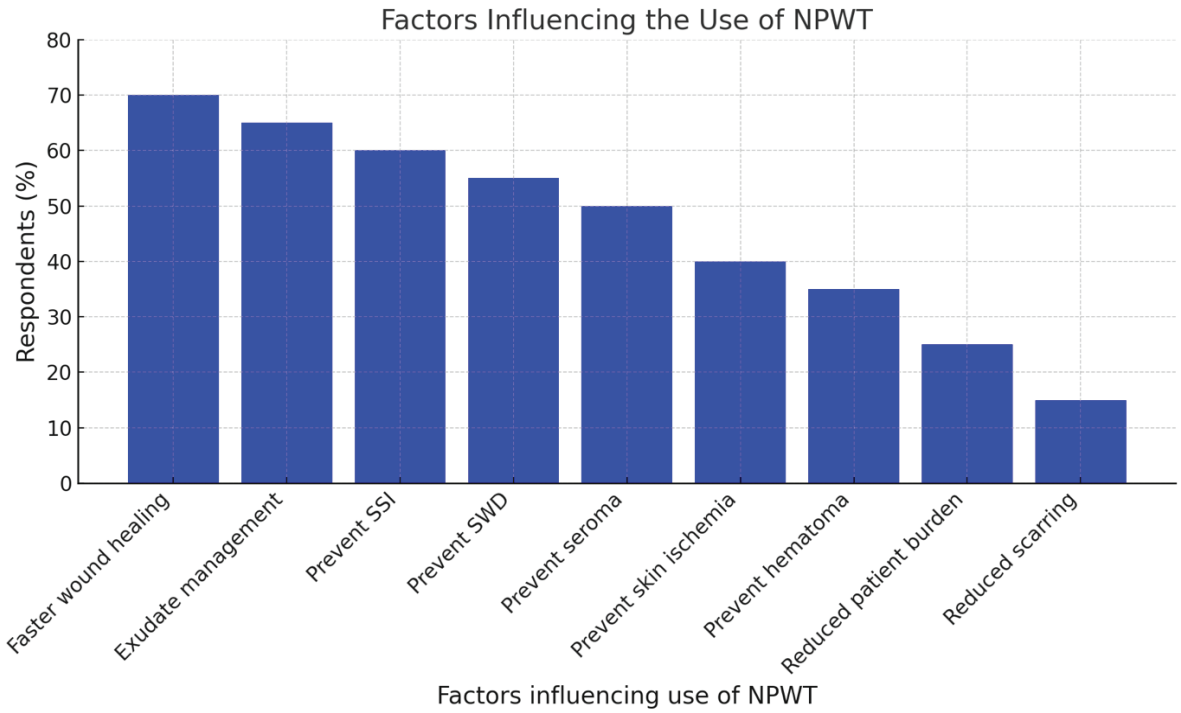
Criteria for selecting sNPWT	Responses (total =168)
Ease of use	
Protection from contamination	61
Evidence-based clinical outcomes	60
Undisturbed wound healing (7-day wear time)	59
Fluid management	56
Reduce occurrence of peri wound maceration	52
Type of dressings used with NPWT system	42
Evidence-based health-economic outcomes	41
Types of negative pressure settings and mode	39
Cost of dressing	39
Patient pain management	32

Discussion

SWCs significantly impact recovery and well-being after surgery, highlighting challenges in incisional wound care and gaps in medical education on wound management. Findings emphasize the need for improved training in skin integrity and wound care, with results suggesting that successful management requires a multidisciplinary approach. Patient outcomes, safety, and precision are deeply interconnected, with SWCs such as SSI and SWD contributing to morbidity and poor healing [25, 39, 43]. Addressing surgeons' perceptions of these challenges presents opportunities to enhance learning and drive sustainable improvements.

More than half of surgeons (55%) rank SWCs among their top three challenges, with 24% identifying them as their primary concern. These complications often reflect the difficulty of managing patients with comorbidities and limited healing capacity, particularly in ageing populations with multimorbidity [16]. Resource constraints were cited by 41% of respondents, highlighting issues with staff shortages, funding limitations, and restricted access to wound care specialists. This delays timely interventions, further exacerbating systemic issues that negatively affect both patients and providers. Additionally, 30% of surgeons expressed concerns about extensive waiting lists, underscoring how these barriers impede optimal care delivery. Infection prevention protocols require constant updates, as noted by 55% of respondents, necessitating practical strategies like regular education, team collaboration, and data-driven analysis to improve

Figure 2. Surgeons perceptions influencing use of NPWT



evidence-based practices [44].

While 33% of surgeons believe existing protocols are generally effective, many expressed a need for improvements to incorporate new evidence. Strategies such as team huddles, continuous education, and leadership support are critical for protocol updates. Enhanced efforts in data tracking and root cause analysis would help identify gaps and improve outcomes across healthcare systems.

NPWT is widely used by 91% of respondents, primarily to prevent SSIs (61%), SWD (55%), and seroma formation (42%). Single-use NPWT devices are preferred in early discharge scenarios, offering convenience and reducing dressing changes at home. Ease of use and prevention of complications are key factors driving NPWT adoption, though comparative studies are needed to fully assess its effectiveness. Cost and patient comfort ranked lower as considerations for its use.

Most surgeons rely on local protocols for dressing selection, with only 21% referring to national or international guidelines. Evidence-based guidelines, grounded in rigorous research and systematic reviews, offer advanced options for postoperative care but face challenges in adoption due to resource constraints and implementation barriers [43, 45, 46, 47, 48]. Strengthening education on dressing advances and improving awareness of guideline benefits are critical for promoting evidence-based practice.

This survey, focused on European and UK surgeons, reflects regional practices that may not generalize to other settings, particularly low-resource environments with disproportionately high SSI rates [11, 49]. Multidisciplinary approaches involving nurses, infection control specialists, and wound care experts are essential for improving outcomes, especially as healthcare systems shift toward value-based care frameworks [50-53]. Future studies should explore interprofessional strategies and address disparities in healthcare resources and social determinants of health.

This study has several limitations that must be considered when interpreting the findings. Survey respondents were current practicing surgeons in Europe and the UK, which introduces sample bias and limits generalizability. Exclusion of other healthcare professionals, such as nurses and tissue viability specialists, may result in an incomplete view of multidisciplinary wound care practices. Additionally, the survey methodology was not validated, posing potential issues with reliability. While it captures surgeon perspectives, a more balanced view including other stakeholders would provide greater insight into shared care approaches.

Regional differences in healthcare systems, resource availability, and clinical practices also impact the applicability of findings. Disparities in access to advanced dressings, post-discharge surveillance, and medical education about wound care further complicate generalizability. The study offers a snapshot of surgeon perceptions in a specific context, and international comparisons may be limited by variations in care delivery. Broader interdisciplinary research, inclusive of diverse geographies and healthcare professionals, is critical

for addressing these disparities and improving surgical wound care outcomes worldwide.

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