

# Post-surgical incision care across the Asia-Pacific region: current practice and perceptions

### Authors:

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**Background and Aims:** Post-surgical incision care is a critical component in optimising patient outcomes and has the potential to reduce the risk of infection and associated complications. Dressing characteristics, selection and change frequency are important aspects of achieving good outcomes. The aims of this study were to gain insights into the current practice of post-surgical incision care across the Asia-Pacific region and assess the potential impact of an expert panel meeting report on clinical practice.

**Methods:** During July 2021, healthcare professionals were invited to participate in an online survey of their clinical practice in surgical incision management.

**Results:** Of 1,854 mail recipients, 1,063 agreed to participate. The largest proportion of respondents were based in Greater China (n=339, 31.9%). Respondents were from a range of professional backgrounds, the largest being surgeons (n=380, 35.8%). The most common categories of post-operative wound dressings used were film and pad dressings (n=343, 32.3%) and bordered foam dressings (n=300, 28.2%). The most common dressing change frequencies were 1–2 days (n=433, 41%) and 3–4 days (n=350, 32.9%). Common reasons for changing a dressing included a need to inspect the wound (n=644), dressing leakage (n=519) and routine change (n=518). Of seven ideal post-operative dressing properties, flexibility and absorbency were rated as the most important. More than three quarters of the respondents (n=822, 77.3%) indicated that they were willing to pay more for a dressing with the ideal characteristics. Two out of five respondents (n=423, 39.8%) indicated that they managed post-operative incision site complications. Surgical site infection was the most commonly reported complication. After reading the mini-consensus meeting report, 74.1% of respondents (n=788) indicated they would consider altering dressing change frequency, and 59% (n=634) indicated that they would reduce the number of changes.

**Conclusions:** There are considerable gaps in current practice for post-surgical incision care. The concept of undisturbed wound healing, patient comfort and the role of education are areas for further consideration and are currently under investigation.

Post-surgical incision care is critical to optimising patient outcomes after surgery. A key aim of post-incision care is to reduce the risk of surgical wound complications, including surgical site infection (SSI) and surgical wound dehiscence (SWD). Surgical wound complications often result in delayed healing, can impair patients' mobility and quality of life, and present additional challenges to achieving satisfactory wound care outcomes.

Estimates of the global prevalence of SSI range from 2–15% (ECDC, 2018). SSI is a leading cause of rehospitalisation and can be fatal (Morgan-Jones et al, 2021; Minski, 2019). Other complications, such as SWD, hypergranulation, peri-wound maceration, scarring and medical adhesive-related skin injury (MARS), are also challenges to optimal outcomes after surgery. SWD, the separation of the margins of a closed surgical incision, may or may not show signs of infection,

Author details on p64

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and its incidence remains unclear (Sandy-Hodgetts et al, 2017, 2018, 2020). Hypergranulation impedes wound healing (Johnson, 2009; Stevens et al, 2009). Peri-wound maceration, as a result of excessive and poorly managed exudate, also interferes with wound healing. It is associated with infection, as well as with oedema and lymphoedema (Sandy-Hodgetts et al, 2020). Scarring can prolong recovery, reduce mobility, increase health-service use and impair quality of life (Duke et al, 2015; Marshall et al, 2018; Brown et al, 2008; Ziolkowski et al, 2019). MARSII can impair the integrity of peri-wound skin, cause pain, increase the risk of infection and delay healing (Ousey and Wasek, 2016).

Dressing selection and use play an important role in achieving optimal post-incision wound healing (WUWHS, 2016). Dressings' characteristics, the frequency of changes and healthcare professionals' knowledge of appropriate dressing use are all factors that affect outcomes. Good use of the most appropriate dressings can help prevent complications and manage them where they occur. However, the availability of dressings, the understanding of their most appropriate use and practices of dressings change frequency all vary markedly across the globe. Use depends on many factors, including local policies and protocols in healthcare institutions, as well as on patients' preferences and professionals' knowledge and practices.

A recent international panel of experts addressed post-surgical incision care practice and dressing selection across the Asia-Pacific, including China, Korea, Japan, Singapore, India, and Australia. The panel aimed to clarify views on incision care and dressing selection for surgical wounds in the Asia-Pacific region, and to discuss and reach a consensus on key recommendations (Morgan-Jones et al, 2021). The panel recommended seven 'ideal' dressing properties for managing post-surgical incisions [Table 1].

The panel also agreed that the principle of undisturbed wound healing (UWH) should guide post-surgical wound care to avoid the risk of complications (Morgan-Jones et al, 2021). UWH is defined as using a dressing with an increased wear time and keeping the dressing in situ (Morgan-Jones et al, 2019). It aims to reduce the risk of contamination of the wound. An international consensus meeting of surgeons in 2019 agreed that UWH deserves more significant consideration in incision care as a means to reduce the risk of contamination of the wound (Morgan-Jones et al, 2019).

Optimal dressing selection is essential to increasing wear time in UWH. The choice of dressings that increase wear time has been found to reduce the exposure of the wound to the risk of contamination (Morgan-Jones et al, 2019).

## Aims

The survey described in this article had two aims: to gain insights from a variety of surgical specialities into the current practice of post-surgical incision care, and to review whether the Asia-Pacific expert panel meeting report (Morgan-Jones et al, 2021) has influenced surgical wound management practice since its publication.

## Methods

The questions were designed by Mölnlycke Health Care (Gothenburg, Sweden) and were reviewed by an independent clinical specialist. The survey was generated using the online platform Survey Monkey ([www.surveymonkey.com](http://www.surveymonkey.com)), and was made available to complete in English, Korean, Japanese, Chinese and Thai. To raise awareness of the survey among wound care practitioners in the Asia-Pacific region, emails were sent out to all subscribers of Wounds International and Wounds UK journals by the publisher OmniaMed Communications (London, UK), a medical education company. Mölnlycke Health Care also directly contacted healthcare professionals in the Asia-Pacific region to invite them to complete the survey via email.

The survey comprising 17 primary questions, some requiring supplementary responses, went live on July 2, 2021. Data were collected up to and including July 20, 2021. A web link to the Asia-Pacific panel meeting report (Morgan-Jones et al, 2021) was provided in the email and in the survey itself.

Participants' current practice was assessed by asking for their most common post-surgical dressing choice, the reasons for their choice, estimates of the frequency of dressing changes, reasons for changing dressings and the incidence of SSI in their clinical setting, if known. Additional

**Table 1. Seven properties of an 'ideal' post-surgical incision wound dressing (Morgan-Jones et al, 2021).**

Flexible (not impede the patient's movement)	Providing elasticity to avoid pulling the skin or blistering (e.g. particularly over knee joints)
Well fixed	Well fixed to the skin on application even if the wound has been disinfected shortly before
Absorbent	Able to handle exudate
Skin protective	For example, reduce the risk of blistering or irritation, not excessively adhesive
Waterproof	Providing a good seal/barrier function and enabling the patient to shower
Eliminate dead space where necessary	Not leaving a gap between the dressing and the wound bed where blood/exudate can pool, potentially causing maceration and increasing infection risk
Patient comfort and atraumatic removal	Reducing the risk of compromising skin integrity

questions sought more detail about their experience of post-surgical complications and the factors that contribute to MARS and SSI. Respondents were also asked about their perception of the ideal properties of a post-surgical dressing, and whether they would be willing to pay more for such a dressing. Finally, respondents were asked to read the Asia-Pacific expert panel meeting report (Morgan-Jones et al, 2021) and consider whether it would change their practice regarding dressing choice and the frequency of dressing changes.

The statistical analysis tabulated responses by number, and percentages were calculated for questions with single-option responses.

## Results

### Demographics

Of 1,854 mail recipients, 1,063 agreed to participate in the survey, a response rate of 57%. The largest proportion of respondents was based in Greater China ( $n=339$ , 32%), followed by Korea ( $n=167$ , 15.7%) and Singapore ( $n=139$ , 13%) [Figure 1].

Surgeons accounted for the largest group of respondents by profession ( $n=380$ , 36%), followed by nurse or nurse manager ( $n=277$ , 26%), and wound care/nurse manager ( $n=150$ , 14%) [Figure 2]. By specialism, general surgery, and orthopaedic specialists accounted for more than one quarter of respondents each ( $n=289$ , 27%) [Figure 3].

### Current practice

The most common categories of post-operative wound dressings used were film and pad dressings ( $n=343$ , 32.3%) and bordered foam dressings ( $n=300$ , 28.2%) [Figure 4 and Table 2].

The most common dressing change frequency was 1–2 days ( $n=433$ , 41%). Changes at 3–4 days ( $n=350$ , 32.9%) and 5–7 days ( $n=228$ , 21.5%) were also common.

The most common reasons for changing a dressing were a need to inspect the wound ( $n=644$ ), dressing leakage ( $n=519$ ), routine change ( $n=518$ ), and a failure of the dressing to stay in place ( $n=429$ ). Dressing saturation ( $n=385$ ) and SSI ( $n=344$ ) were also important reasons.

Two out of five respondents ( $n=423$ , 39.8%) indicated that they managed post-operative incision site complications. They were asked what they perceived to be the most significant factor in preventing SSI on a scale of 1–8. Good surgical technique was rated to have the most significant impact by the greatest number of respondents ( $n=262$ , 27.8%), followed by patient hygiene ( $n=220$ , 23.3%) [Figure 5].

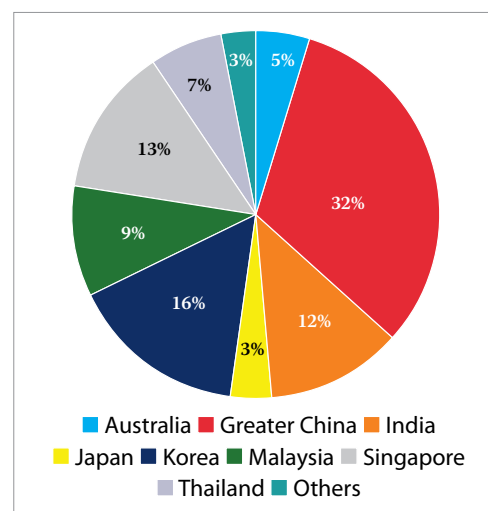


Figure 1. Geographic distribution of respondents ( $n=1,063$ )

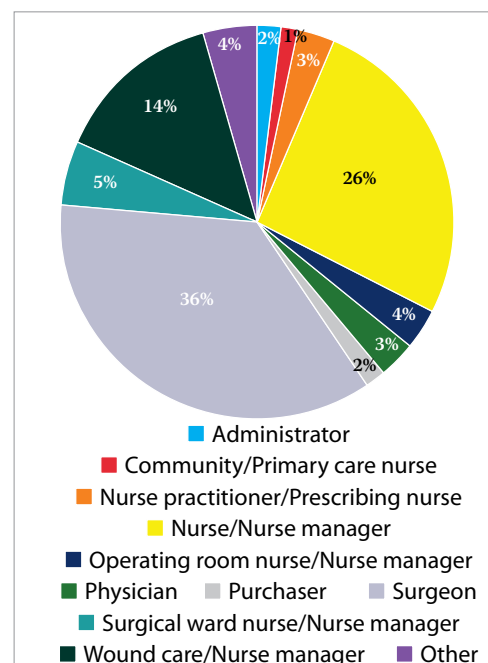


Figure 2. Distribution of respondents profession ( $n=1,063$ )

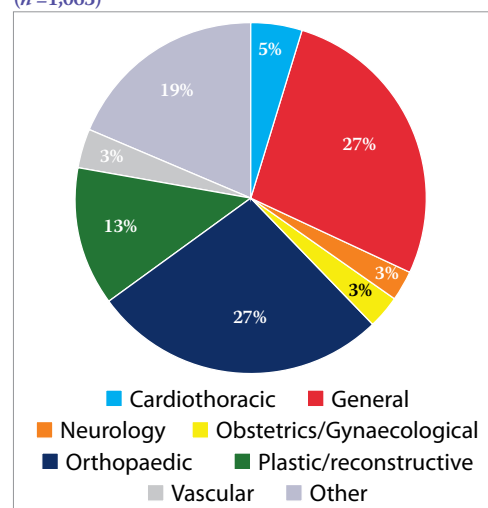
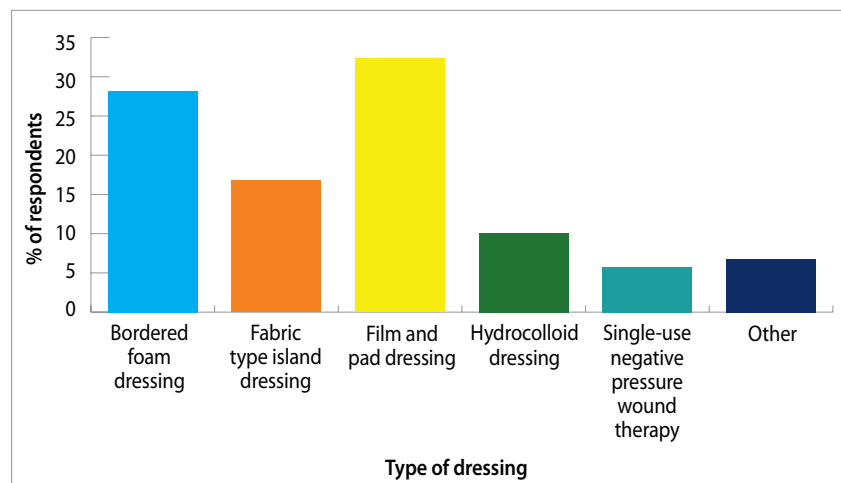


Figure 3. Distribution of respondents by speciality ( $n=1,063$ )

**Table 2. Most common post-operative dressing used, reason for choice, estimated frequency of changes, and presence of surgical site infection**

		Film and pad dressing		Bordered foam dressing		Fabric type island dressing		Hydrocolloid dressing		Single-use negative pressure wound therapy		Other or 'no response'	
		n.	%	n.	%	n.	%	n.	%	n.	%	n.	%
Most commonly used		343	32.3	300	28.2	178	16.8	107	10.1	62	5.8	73	6.9
Reason for choice (more than one response possible)	Product/treatment readily available	178		134		128		43		11			
	Product/treatment included in clinical protocol	71		60		45		16		16			
	Cost of product/treatment	145		65		102		29		12			
	Performance of product/treatment	153		197		55		60		35			
	Personal preference	37		67		22		19		8			
	Surgeon's preference	162		99		58		34		17			
	Clinical evidence	47		88		20		19		29			
	Economic evidence	38		23		43		10		6			
Patient comfort	89		97		34		22		18				
Frequency of change	1-2 days	125	36.4	114	38.0	99	55.6	35	32.7	21	33.9		
	3-4 days	124	36.2	109	36.3	42	23.6	43	40.2	20	32.3		
	5-7 days	72	21.0	70	23.3	28	15.7	26	24.3	18	29.0		
	8-10 days	12	3.5	5	1.7	2	1.1	1	0.9	2	3.2		
	≥11 days	8	2.3	1	0.3	7	3.9	2	1.9	0	0.0		
	No response	2	0.6	1	0.3	0	0.0	0	0.0	1	1.6		
	<b>Subtotal</b>	<b>343</b>	<b>100.0</b>	<b>300</b>	<b>99.9</b>	<b>178</b>	<b>99.9</b>	<b>107</b>	<b>100.0</b>	<b>62</b>	<b>100.0</b>		



**Figure 4. Common post-operative dressing in current practice.**

### The "ideal dressing"

The participants rated flexibility and absorbency as the most important in the prevention of SSI, among the seven properties of an ideal post-operative dressing, as defined in the Asia-Pacific panel meeting report (Morgan-Jones et al, 2021) [Table 1]. Flexibility was regarded as most important by almost one third ( $n=292$ , 31%), and absorbency by one in five respondents ( $n=205$ , 21.7%). The others, in order of importance, were elimination of dead space ( $n=196$ , 20.8%),

protection ( $n=104$ , 11%), adherence ( $n=93$ , 9.9%), waterproof capacity ( $n=30$ , 3.2%), and patient comfort and atraumatic removal ( $n=23$ , 2.4%).

A separate question asked respondents to identify the characteristics of the ideal post-operative dressing in more detail. The properties considered to be most important were ability to absorb/retain exudate/and or blood ( $n=733$ ), ability to stay securely in place ( $n=633$ ), suitability for extended wear time ( $n=423$ ), flexibility ( $n=578$ ), degree of stretch to reduce blistering ( $n=529$ ) and ability to conform to different anatomical locations ( $n=544$ ).

More than three quarters of the respondents ( $n=822$ , 77.3%) indicated that they would be willing to pay more for a dressing with the ideal characteristics [Figure 6].

### Impact of Asia-Pacific panel meeting report on dressing choice and frequency of change

After survey respondents read the Asia-Pacific panel meeting report (Morgan-Jones et al, 2021), three-quarters of respondents ( $n=788$ , 74.1%) reported that they would consider changing the frequency of post-operative dressing changes. Although a majority said they would not change their choice of dressings after reading the Asia-Pacific meeting report ( $n=612$ , 57.6%), a

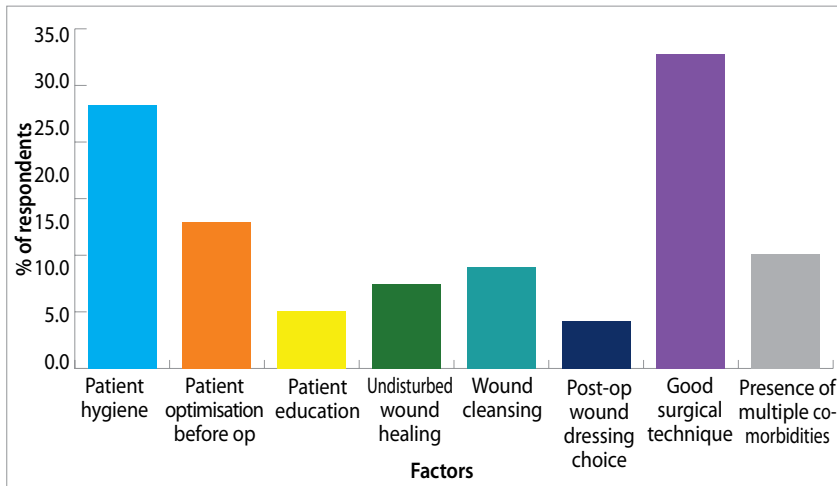


Figure 5. Perceived key factors in SSI prevention

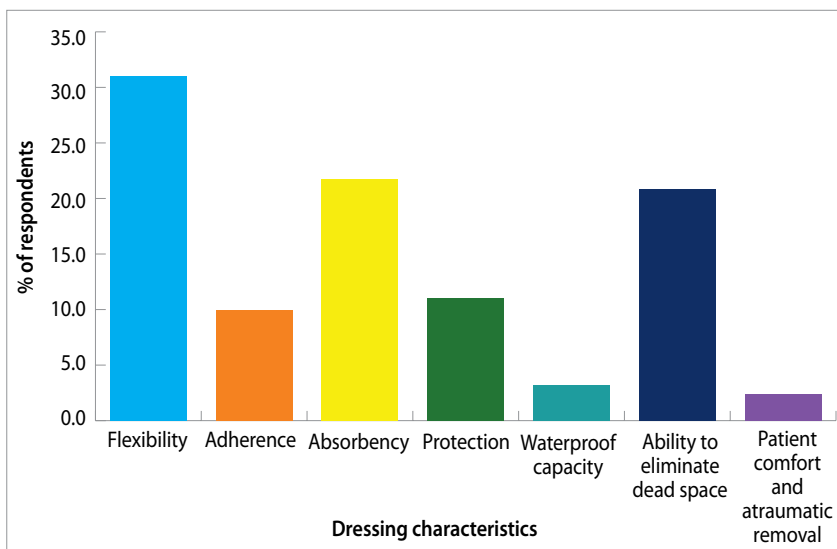


Figure 6. Characteristics of ideal post-operative dressing

considerable portion of respondents specified that they would consider extended dressing wear times by changing post-surgical dressings less frequently ( $n=634$ , 59.6%).

## Discussion

### Gaps in practice

Improving wound healing times and reducing the incidence of complications following surgery remain considerable challenges for healthcare professionals involved in post-surgical incision care, spanning the surgical, acute, primary and community nursing sectors. Complications such as SSI, SWD, scarring and MARS can delay healing, reduce patients' quality of life and impair outcomes (Sandy-Hodgetts et al, 2020). For optimal healing outcomes after surgery, the delivery of surgical wound care should ideally synchronise across sectors in provision of care for the patient; essentially a wound care plan devised with a multidisciplinary approach and followed consistently after each clinical review.

Dressing changes are necessary for clinical assessment and management of the wound, to treat infection and other complications. However, they also expose the wound to new risks of contamination, as well as the potential for damage to the peri-wound skin caused by dressing removal.

These survey results highlight there are many factors that determine dressing change frequency, including the type of dressing used, the condition of the wound and signs of infection or other post-surgical complications, local availability of dressing types, local policies on dressing use and change frequency. Patient preference is also important and might be considered differently in different regions, depending on healthcare culture and protocols.

Attention to signs of possible infection is critically important in the assessment of post-surgical wounds. An international consensus report on incision care and dressing selection in surgical wounds recommends specific criteria for post-operative dressing change, including changing the dressing in the presence of wound dressing material saturation, excessive bleeding, suspected local or systemic infection and potential wound dehiscence (Morgan-Jones et al, 2019).

However, inflammation in the first days after surgery is more likely to result from normal wound healing than of SSI (Morgan-Jones et al, 2021). An over-focus on infection may result in overlooking other complications in surgical wound healing (Sandy-Hodgetts et al, 2020). Complications such as SWD can occur in the absence of infection, so that there is a need to carefully weigh the signs of complications, the risks of infection and contamination of the wound, with patient history and dressing selection when considering dressing changes.

### Undisturbed wound healing

Important benefits can be gained by extending dressing wear times, where appropriate.

In the past, many surgeons advocated keeping dressings in place for 7 days after surgery, but wear times today are typically much shorter (Brindle and Farmer, 2019; Morgan-Jones et al, 2019). The results from the survey suggest there is a correlation between higher frequency of dressing change and a higher potential risk of post-operative incision site complications [Figure 7]. In the current survey, two in five respondents estimated dressing change frequency at 1–2 days ( $n=433$ , 41%), although a majority showed a willingness to change practice if presented with good evidence to do so. UWH has a number of benefits, including optimising the healing environment for the wound by reducing the risk of contamination and potential infection

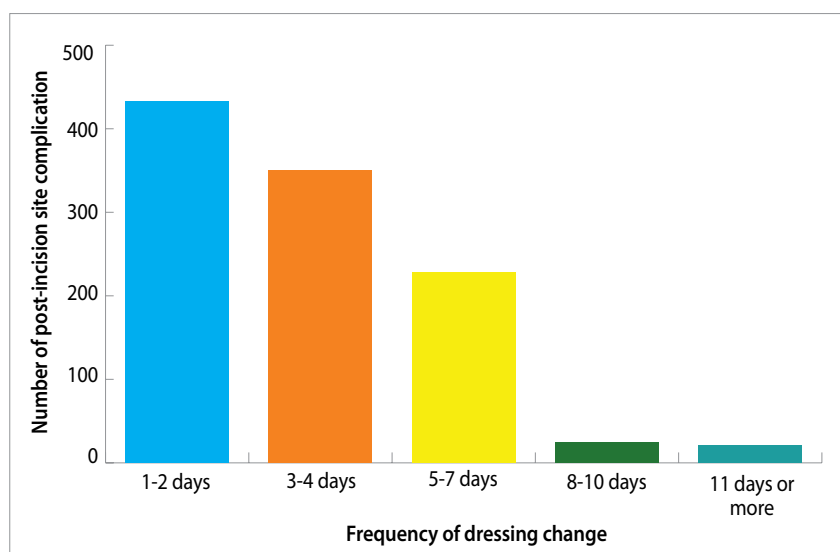


Figure 7. Frequency of dressing change and post-incision site complications

(Brindle and Farmer, 2019). Extending dressing wear time may also reduce the potential risk of MARSIs, such as damage to the peri-wound skin from dressing removal, and help reduce patients' apprehension about dressing changes (Morgan-Jones et al, 2019). UWH can also offer potential savings in dressing costs and clinician time (Brindle and Farmer, 2019).

#### Holistic care and patient preference

Morgan-Jones et al (2019) emphasised the importance of holistic assessment of the patient. It is essential to fully assess a patient's surgical and medical history, comorbidities and their infection risk as part of a complete holistic assessment.

Geographical factors and professional competency might be reasons not to extend dressing wear times, where travel to reach healthcare facilities is long or difficult for the patient, or where professional care cannot be provided in the home, for example. Some patients may prefer more frequent dressing changes, to meet social or personal preferences or because of comorbidities (Morgan-Jones et al, 2021).

#### Cost and product availability

The finding that 77.3% of respondents would be willing to pay more for a dressing with the ideal characteristics provides evidence that cost does not influence clinical decision-making in choosing the ideal post-surgical dressing. However, the availability of appropriate dressings was identified as a problem. Many respondents wanted improved product availability ( $n=340$ ).

#### Impact of Asia-Pacific panel meeting report

Many respondents indicated they might alter their practice in terms of dressing change frequency as

a result of reading the Asia-Pacific panel meeting report (Morgan-Jones et al, 2021). While two out of five respondents estimated that the overall frequency of dressing change in their current practice was every 1–2 days, three out of five said they would consider extending wear time after reading the meeting report. This finding indicates an appreciation of the principles of UWH among the respondents and a willingness to consider adopting them.

#### Role of education

Respondents were willing to change their practice in response to new evidence. A majority said they would consider changing their practice after reading the mini-consensus meeting report. Many also wanted more clinical research data to help change their dressing selection ( $n=397$ ). These findings suggest that respondents would welcome further research evidence, demonstrating the value of UWH principles in practice and the potential of specific dressing types to extend wear time and reduce the risk of wound contamination. Morgan-Jones et al (2021) cited the need for more evidence to inform guidelines for reducing dressing changes.

#### Limitations

One limitation of this survey is that differences in surgical and wound care practice, standards and professional status across such a diverse group of professionals from many different countries might lead to varying interpretations of the questions and skew the responses. In addition, although the survey was available in five languages (English, Chinese, Japanese, Thai and Korean), it is likely that some respondents used a language that was not their native one, which increases the chance of misinterpretations of the survey questions. Therefore, caution is needed to generalise the findings, which might not be fully representative of practice in post-surgical wound care in all these countries.

#### Conclusions

The achievement of optimal post-surgical incision care demands attention to the signs of wound complications of the incision site itself, but also of patient-related symptoms. Care to minimise the risk of SSI and other complications and deliver an effective response when they occur depends upon a number of factors: the selection of appropriate dressings for the care goals of the patient and the optimal timing for dressing changes. Optimal outcomes also depend on patients' access to competent and capable healthcare professionals with up-to-date

knowledge of holistic assessment of the patient's history and needs and appropriate dressing use.

The results of this survey suggest the need for further research, currently underway, to demonstrate the value of UWH principles in practice, and to demonstrate the potential of different dressing types to extend wear time and reduce the risk of wound contamination. UWH has the potential to optimise post-surgical wound healing and guide the clinician in selecting appropriate dressings in clinical management of the patient.

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