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- APPSA is a non-profit organisation which exists for the benefit of its members. This is accomplished by way of congresses, local meetings and travel grants, with the express goal of raising the standard of peri-operative practice in South Africa

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Association for Peri-operative Practitioners in South Africa

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**CHAPTERS:**

| | |
|---|---|
| *Mrs G Botha* | Freestate/Northern Cape |
| *Mrs S Rohit* | KwaZulu Natal |
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| *Mrs D Kisten* | Pta/Limpopo/North West |





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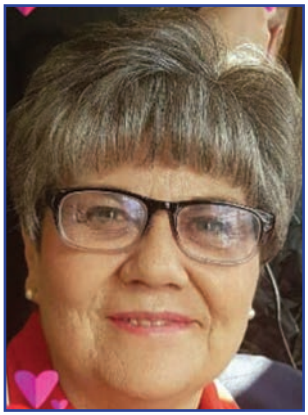
# Contents




## REGULAR FEATURES



# From The President

Goodness gracious, it is already the middle of February 2025! It seems like only yesterday when we were planning what we were going to serve at our Christmas lunch and, before we had time to wipe the sleep out of the corners of our eyes, it's February. For those of you who had a break, I am sure it is long forgotten, but I hope the memories you made with loved ones are still fresh in you heart. Keep them close - because when you have rough days (and sadly, that is the reality called LIFE) these are the things that sustain us.

I don't know about you, but I am very excited about our up-coming *A Time For Excellence* APPSA Congress, taking place in May in Johannesburg. It's a very apt theme - because that is what we should be striving for in everything we do. Our patients' lives depend on it! Every one of us - especially those in management roles - know how hospital management boards expect more from less. Budgets are tighter and yet expectations are greater. You are having to do more with less ... and excellence becomes harder to 'manufacture'. This is where WE, as the glue in the hospital, have to come to the fore. Our expertise has to shine in everything we do. Our commitment to our patients - first and foremost - needs to shine as a beacon. There can be no 'second best'. There can be no 'near misses'. There can be no 'mistakes'. Our patients depend on us to be their advocates. We are an integral part of the team that keeps them alive when they cannot fend - or speak - for themselves.

The looming concept of NHI is at the forefront of every South African's mind. The Government is sabre-rattling about its 'imminent implementation' but the reality is there is just no money to make it a happen in the near future. There are far too few staff, too few NHI-ready facilities to implement what is needed, and with the recent developments and the massive cutting of aid by the US Government to South Africa - across the majority of departments, but especially in healthcare - it is not feasible in the short term. Vital programmes across healthcare - including jobs for healthcare professionals - have already been affected. The long-term implications are still to be felt. That is why I say I doubt NHI will become a reality as a Government policy in the near future. In reality, we are already implementing NHI in primary healthcare and in government-run facilities. No one is denied emergency treatment, and access to healthcare. It is just in non-emergency situations that the need is dire because of delays, postponements and cancellations. And that is where the bottlenecks come in. These are the BAD days I was talking about. When patients get angry because their surgery is cancelled and we have to send them home - again - in pain because resources are depleted. This is when resilience (on our part) becomes so difficult to manage. But we have to stay strong - for ourselves, our families, and our patients.

On a positive note, we hope to have a FULL complement of updated APPSA Guidelines at the APPSA Congress. I would like to express my thanks and appreciation for the hard work of the APPSA Chapter Presidents who worked on the updates; and to and Carma Design who sourced advertising from our trade partners, and then designed and printed the Guidelines that will be on sale at the up-coming APPSA Congress and beyond. We look forward to seeing you in May. As always, our Congress is guaranteed to inspire and empower you for the year ahead. Until then, be strong and be safe.

**Marilyn de Meyer**
**APPSA President**

# From The Editor

**Happy, Happy Twenty, Twenty THRIVE!**

I hope this year will bring us all renewed energy, determination, commitment and happiness: energy to take life by the horns and make the best of it; determination to be better today than you were yesterday; commitment to being kind to yourself before anyone else because, if the past couple of years has taught me anything it is that you cannot pour from an empty cup; and happiness in everything you do and undertake - professionally and personally.

All too often, as members of a caring profession, you put the interests of patients, colleagues and employers before your own selves. Especially their happiness. That leaves you depleted and empty. And if one is depleted and empty, one cannot do one's job effectively - as I said: you cannot pour from an empty cup. So, my appeal to each and every APPSA member is this: if only for a few minutes EVERY DAY, exercise a bit of self love, self care, self interest and self reflection. Look after YOU before you try and look after others, so that your cup never gets completely empty.

In the November APPSA Journal *Editor's Letter* I spoke about the trepidation I had about the swearing in of the Trump administration in the United States. People asked me why I was obsessed with US politics when we have so many problems in South Africa. And on 26 January 2025, one of my worst nightmares became a catastrophic reality to global healthcare: Donald Trump decided to halt ALL foreign aid for healthcare, food aid and maternal and childcare grants outside of the United States for a period of 90 days. USAID and PEPFAR aid was stopped by the stroke of a pen, completely stopping this country's HIV/AIDs, TB, Malaria, maternal health and gender-reassignment hormone replacement therapy programmes overnight. According to a report printed in the *Daily Maverick*, South Africa has the largest PEPFAR portfolio in the world. For the US financial year from October 2024 to September 2025, South Africa received about $440-million for its HIV/AIDS programme. According to the Andelson Office of Public Policy at the Foundation for AIDS Research, PEPFAR supported 13 815 individual direct clinical providers in South Africa in 2024, including 178 doctors or clinical officers; 1 984 nurses and midwives; and 199 pharmacists or pharmacy assistants. According to the Executive Order, medication cannot be dispensed; patients cannot be seen; and care cannot be provided. It takes just one week of no medication for an HIV-positive patient whose viral load has been almost completely suppressed to spiral out of control. It takes just one week for a breast-feeding mother who stops her ARVs to transmit HIV to her baby. It takes just one week to reverse 20 years of medical gains and return South Africa to the dark days of the 1980s when contracting HIV/AIDS was a death sentence.

And Donald Trump signed the Executive Order without batting an eyelid. His Secretary of State, Marco Rubio, managed to get an interdict halting the Order until Monday 03 February 'while alternatives are being investigated' but there was no time to prepare patients with enough medication. And what if - on 03 February - Trump still determines the Order holds? What then? This doesn't only affect HIV/AIDS programmes. In Ethopia, thousands of children under the age of five getting food aid through Action Against Hunger suddenly had their grants stopped - effectively taking their only source of food ... out of their hands. My heart is heavy. We could be in for a very rough ride and all we can do is pray for a miracle on the horizon.

**Editor**
**Madeleine Hicklin**

# Discharge Delay From The Post Anaesthesia Care Unit: A Nursing Perspective

**By Ruowen Peng BNHons, RN; Farida Saghafi PhD, RN; Hazel Maxwell, PhD**

**BACKGROUND**

The Post-Anaesthesia Care Unit (PACU) is a critical junction between the operating room (OR) and the wards. It is essential for the close monitoring of patients before they are discharged to their destination wards for recovery. Many clinical and non-clinical factors influence the flow of patient discharge from the PACU to the wards. This study explores PACU nurses' perceptions of non-clinical factors causing discharge delays and how these impact the work of nurses.

**INTRODUCTION**

The (PACU) is where post-operative patients recover from the effects of anaesthesia. As a significant part of the peri-operative setting, the PACU works as a critical junction between the OR and surgical wards. Patients who receive general and regional anaesthesia are transferred to the PACU after surgeries for close monitoring of haemodynamic status and signs of deterioration[1]. Timely patient discharge from the PACU to surgical wards is crucial in maintaining patient flow[2]. Implementing an effective PACU discharge flow ensures that space is available in the PACU to receive new patients. This means patients' discharge from the OR is not delayed; instead, they can be transferred to the PACU promptly[2, 3].

Previous studies demonstrate that discharge delays impact patients, clinicians and the health system. The impact on the patient's psychological and physical recovery has been well researched[4, 5]. Observing an emergency event or another patient in a critical condition in the PACU may cause anxiety and stress for patients[4]. Discharge delays from the PACU to the wards may also delay the patients' early mobilisation process[5]. For instance, patients who had joint replacement surgery need early mobilisation to minimise post-operative complications, and discharge delays would impact post-operative physiotherapy evaluation[5]. Furthermore, the impact of discharge delay on clinicians has been highlighted in various studies[6, 7, 8].

Due to the critical condition of PACU patients, the patient-nurse ratio needs to be maintained at a standard level. As a result, having a higher number of patients than scheduled is not ideal[6, 7, 8]. This could affect staff workload as they need to closely monitor patients who cannot be discharged on time, as well as provide care to the new, immediately post-operative patients transferred to the PACU. The prolonged stay in the PACU also impacts the healthcare system by affecting patient flow and delaying the surgical schedule[2, 3, 5, 9,10]. Timely PACU discharge, on the other hand, reduces the waiting time between each surgery and the risk of cancellations. Discharge on time also helps with PACU staff rosters, reduces hospital costs and minimises risk to patient safety[9, 10].

PACU discharge delays occur due to both clinical and non-clinical factors. Discharge delays associated with clinical factors have been widely discussed in the literature[11, 12, 13] but there is limited evidence concerning non-clinical factors causing discharge delays in the PACU. Non-clinical factors account for 25% to 30% of prolonged stays in the PACU[14]. Three main non-clinical factors have been established: they are bed blocks, lack of available nurses at the clinical destination areas, and patient transport shortages[5, 9, 14, 15, 16].

This study will explore the gap in knowledge concerning the experience of registered nurses working in the PACU and focus on non-clinical factors related to discharge delay. The research explores how discharge delay influences nurses' thoughts, feelings, daily work routines and practices. This study fills a research gap by investigating the impacts of discharge delay on PACU nurses and exploring nurses' perspective on this issue, which influences their work on a daily basis. These insights will inform nurse managers and administrative processes regarding these on-going issues.

## AIM

The aim of this study is to explore registered nurses' perspectives regarding non-clinical factors influencing patients' length of stay in the PACU.

## METHODS

*Design*

This study used an exploratory qualitative research design to investigate PACU nurses' perspectives on their experience with discharge delays related to non-clinical factors. Exploratory research helps specify a challenge or problem and guide future study[17]. This methodology is widely used in nursing and healthcare research as it is suitable for exploring essential healthcare questions and defining critical clinical issues[18]. It can provide a descriptive analysis of a phenomenon with straightforward descriptions of experiences and perceptions[19]. This methodology involves the collection and analysis of individual interview data to get a better understanding of perspectives, views or experiences. In this study, using exploratory qualitative methodology assisted in recognising the phenomenon of PACU discharge delay due to non-clinical factors as perceived by participants.

Ethics approval was granted by the University Health and Medical Human Research Ethics Committees (HREC) (*Reference: H0023729*). Ethics approval was also provided by the HREC of the Department of Health and Human Services (Victoria) and the study site.

## SETTING AND PARTICIPANTS

The study was conducted at an acute private hospital in Victoria, Australia. The hospital provides an extensive range of healthcare services, including a 24-hour emergency department, intensive care, coronary care, integrated theatres, cardiac catheterisation laboratory and oncology services. Integrated theatres comprise seven ORs, one cardiac catheterisation laboratory and one PACU. The PACU has 14 bays receiving between 60 and 70 post-operative patients daily, excluding public holidays and weekends, from the day surgery centre and surgical wards. The study population consisted of 10 registered nurses

who work full-time or part-time with at least 12 months of experience working in the PACU. As qualitative research explores the 'why' and 'how' of a phenomenon or behaviour, this number of participants was deemed satisfactory for answering the research question. A smaller number of participants serves the purpose of the research, providing rich content analyses, and can lead to profound insight into a phenomenon[20]. Participants were approached via email by the researcher, who is a colleague with an equal position to the other registered nurses. Invitation emails were sent through the hospital emailing system with the participant information sheet and consent form. All participants were given pseudonyms.

*Data collection*

Face-to-face interviews were organised after the information sheet and consent form were signed. The interviews were conducted in the OR office, where participants felt comfortable talking openly with the interviewer. The OR office was selected as the interview site as the location is separated from the PACU and privacy can be ensured. COVID-safe protocols were followed during data collection, including using N95 face masks and 1.5m social distance. Semi-structured interviews were recorded and lasted for approximately 40 minutes. At the time of data collection, 10 PACU nurses signed the written consent form to participate in this study. Participants were asked to describe their interactions with patients and the effects these experiences had on the nurses when patient stay in PACU was prolonged.Interviews were recorded using a digital recorder and manually transcribed into text verbatim, ensuring the findings' accuracy, credibility and reliability.

*Data analysis*

The researchers used Braun and Clarke's thematic analysis framework[21] to identify patterns and themes from interview transcripts. The thematic analysis approach provides rich and detailed data about people's views, mentality, experiences and values, and involves identifying recurring themes across various interviews[22]. Data collected from audio recordings and interview transcripts were examined closely using NVivo, which assisted with grouping responses to each question, then initial codes were generated. Common threads, such as topics, ideas and patterns of meaning, were searched and found. Researchers then interpreted data and determined themes to fit the research questions[21, 22].

*Findings*

The data concerning the nursing experience of patient discharge delay about non-clinical factors was organised under four themes: 'accepted as part of the day', 'wards are never ready', 'feeling frustrated, powerless and stressed' and 'empathy for patients'.

***Accepted as part of the day***

All participants described experiences of discharge delay caused by non-clinical factors as a regular event, and part of their day. They believed that as it happened every day and they had no control over it, they would accept it as part of their work. One of the participants claimed that discharge delay from non-clinical factors was happening every single day.

*I would say every day, but I don't know the exact number of statistics. But every single day, there are definite delays from non-clinical reasons. Because at that moment, our computer has the registration of the time starting from when we called. Then if they get delayed, it will pop up on a screen to ask you the reason for the delay. So, I would say it is every day when I work - Ivy*

One participant (Olivia) explained that although discharge delays depended on the OR list, they usually happened daily. This daily occurrence was then confirmed by another participant (Skyla). Six out of 10 participants claimed that this issue had become a part of their work routine. One participant commented that as it happens so often, she is not surprised when she rings the ward and is told the bed is not ready.

*Everyone is complaining about it. No one really copes with it. We all get really frustrated when we are waiting for patients to be discharged ... I think we are all the same, the same attitude too, like, we cannot do anything about it or change anything. You just kind of roll your eyes, and that is what it is - Tammy*

***Wards are never ready***

All participants had experienced the situation when the destination clinical area was not ready to receive the patient. This was due to multiple factors, listed by participants as lack of available beds (also known as bed block), unavailability of nurses in the wards, and communication friction between PACU and ward staff. All participants identified bed block as one of the main factors leading to patients' prolonged stay in the PACU. Participants explained that patients needed to wait longer than expected to be discharged because the bed in the destination ward was unavailable.

*A) The ward bed is not ready as the patient in that room is not ready for discharge and [out of] the room for it to be cleaned. The bed is not being cleared and not unoccupied for theatre patients, which is one of the biggest delays in hospitals - Lin*

*B) The major factor to bed block is the ward expects a certain amount of discharges. Many patients are elderly, so they do not move out quickly. However, theatres keep moving, so you have patients having a prolonged stay in recovery because the ward beds are not emptied yet - Nina*

Another important factor mentioned by most participants was the delay caused by nurses being unavailable on the ward to receive the patient. One of the participants empathised with ward nurses who were also under high stress as they were trying to organise their break time while patients were due to arrive at the ward, and fewer nurses were working on the floor. One participant (Helen) explained that finding available ward nurses to transfer patients from the PACU was challenging. Other factors related to the lack of available nurses were ward nurses having breaks, shift handovers and the Medical Emergency Team (MET) being called to help with deteriorated patients.

*A) Good instances are that the staff has breaks, and the handover, so they take like an hour for doing a handover ... we just have to wait for them to be ready - Olivia*

*B) I do not think that patients should wait for the nurses because they have to do a handover because surely not everyone is in the handover, and they need to help each other to pick up patients ... Handover time, I found, is a very regular time to have ward delay - Ivy*

*C) There is a funny thing on the wards when there is a MET call. The whole ward seems to shut down and, like, even though the nurses might not be [with] their patients, the ward refuses to take any other patients during that time - Tammy*

***Feeling frustrated, powerless and stressed***

PACU nurses in this study expressed frustration as they felt powerless to prevent discharge delays. Half of the participants felt the delay was out of their control, making them feel frustrated and powerless. One participant (Helen) expressed that when a discharge delay happened, all she could do was make the patient comfortable for as long as necessary because it was a situation outside of her control. Other participants expressed frustration.

*A) From being frustrated to getting used to it. Everybody is trying their best to do it, but it just does not seem to solve the problem - Ivy*

*B) Personally, I feel frustrated that we are failing. I do not like to not do a good job. So, we are not doing a good job with discharge delays. It feels like ... it is reflective of us, even though it is not a nursing issue, and we cannot do anything about it - Janice*

PACU nurses' frustration also resulted from feeling upset and embarrassed when patients had no choice but to stay in PACU for hours. All participants mentioned they felt stressed due to frequent delays in discharging their patients from the PACU. The discharge delay caused bed blocks from the OR to the PACU and, as a result, PACU nurses felt stressed as they had to refuse and delay taking new patients from the OR. Furthermore, they stated that additional tasks while the patient remained in the PACU requiring their attention caused them to feel stressed. They were concerned that the increased workload could cause a delay in attending to haemodynamically unstable patients post-anaesthesia. They reported feeling embarrassed about patients' discharge delays. Participants explained that they felt under pressure when the OR flow slowed down due to bed blocks in the PACU.

*A) You get pressures from the OR ... the OR keeps ringing wanting to bring a new patient out of recovery. You have told them that we are not ready as there is no bay or no nurses to look after another post-anaesthetic patient, but they will still show up in recovery. So it just gets messy, and everyone gets stressed - Olivia*

B) *We cannot leave patients unattended, so we have to block them even though this OR is ready to come out. And they will be pressuring you to come to take the patient because they need to start the next case to continue the workflow. So, it is quite stressful - Janice*

The PACU nurse-patient ratio is one-to-one for all unconscious patients, children and patients with pain protocol; two nurses to one patient for unstable patients; and one nurse to two patients ready to return to the ward[1]. Therefore, the problem occurs when stable patients remain in the PACU longer than expected, as the nurse-patient ratio is affected. When the patient remains in the PACU, the nurses are required to continue providing care for them; this increases the nurses' workloads and takes them away from unstable patients, inducing stress.

*A) It is very stressful when there are so many delays, and then your patients start to want to go to the toilet, or they start to want to drink and eat. Sometimes they wait for two or three hours; of course, they will start to feel sore again. Then we have to treat their pain management again from the beginning - Skyla*

*B) Sometimes we can even have six, seven patients waiting. Then my staff cannot even go for breaks, because everyone has two patients. They have all reached the limit of nurse-patient ratios, so it is tough to organise people for breaks - Ivy*

The tense atmosphere was also identified by participants feeling stressed, as the tension was elevated in the PACU. One participant (Lin) recognised that non-clinical delays cause stress in the PACU environment. PACU nurses were working between other units (OR and wards) and this caused friction between staff. The conflict originated from the OR staff trying to send new patients to the PACU. Then the problem could worsen when the PACU attempted to push stable post-operative patients to destination wards. Peoples' stress escalates everyone else's stress.

Two participants (Helen and Skyla) believed they were stressed by everything else around them. However, another participant (Lin) thought this kind of conflict in the workplace should not be there in the first place.

***Empathy for patients***

All participants expressed empathy for patients who experienced a discharge delay from the PACU. They were concerned that discharge delay would impact patients' surgical experience. They believed that patients' clinical conditions might not change but their well-being would be affected. The participants believed patients in the PACU could become frustrated as they were limited - they did not have their belongings, they could not relax by enjoying entertainment on TV or calling or seeing their family - or they could feel isolated because their loved ones could not accompany them.

*Patients are wide awake, but they do not have a TV. They do not have phones or anything that will pass the time. Yeah, they can sometimes lie there for hours, just watching everything else in the room, which is not fair for other patients. They are waking up, but it is just not what they need. It is a private hospital – they should be moved on nice and quickly - Tammy*

One participant (Ran) felt terrible and embarrassed that she was not providing the service she had promised patients.

*You get frustrated. And yeah, you do. You get upset. You can't. It's not good caring to have someone sitting there for hours. Just lying there like, yeah, and the only reason they're here is that you can't move them on - Ran*

Another participant (Skyla) also expressed feeling upset because patients should not wait so long. She believed patients expected that they could come in for a procedure without delay. PACU nurses consider discharge delay as being unfair to patients.

I*t is unfair to patients to get exposure to noise and stimulation that they do not need. It is unfair to see other sick patients suffering from pain or unconscious patients intubated with a breathing tube - Lin*

This participant (Lin) also believed the PACU was unsuitable for patients after they had recovered from the immediate post-anaesthetic phase. Another participant (Skyla) had a similar view.

*The whole patient journey should be considered, and being discharged from recovery to the ward is a part of their care because you do not want to have an unhappy patient. That just takes away from the whole experience of being in hospital - Skyla*

Other participants (Olivia and Jennifer) reported frustration because, as nurses, they believe they are supposed to be the patient's advocate and focus on their primary care responsibilities.

*Although you need to focus on a new unconscious patient, you are still trying to make the [earlier] patient feel that they are cared for and getting everything they need in the PACU environment. It is not really the right environment for patients ready to be discharged - Jennifer*

The patients' holistic healthcare needs were another concern discussed by PACU nurses. Participants stated that the PACU is designed for the first phase after anaesthesia and as a quick turnover, critical department. Therefore, the setting of the PACU is not intended to meet all patients' physical and emotional needs. Hence, when a patient stayed longer than expected, while they were haemodynamically stable, their other needs would not have been met. This was a concern for participants in this study. For example, one participant commented that PACU nurses could only offer patients bedpans. Another participant empathised with patients' concerns if their next of kin had already been updated with their status. The PACU nurses believed the patient experienced anxiety if their family waited outside while they could not be with them or when they saw other patients being discharged and still waiting to transfer to another clinical area.

*I think because we give higher level care in recovery, that care is not compromised. The only thing is their physical needs, to feel normal to go to the toilet in the ward or have things even to drink. And maybe they just want to watch TV or so in their room. They finished their surgery, and they are awake. They want to go back to normal, you know, at least a bit normal to be in the room. So that part of the more emotional needs, you know, and they can see their family in the room too - Ivy*

## DISCUSSION

This study's findings have uncovered PACU nurses' experiences regarding delayed patient discharge from the PACU to in-patient wards caused by non-clinical factors. The analysis of the interviews demonstrates that the experience of discharge delay for PACU nurses appears to be closely related to the lack of available beds and staffing in destination wards as this results in delayed transfer of patients from the PACU. All participants expressed concerns about the lack of available ward beds, or ward nurses causing discharge delays in the PACU. The interviews also reveal PACU nurses' perception of non-clinical discharge delays and how this event would induce feelings of stress, frustration and hopelessness at work.

Australian studies conducted by Cobbe and Barford[9] and Cowie and Corcoran[14] discuss how nonclinical factors impact discharge flow. However, only one study in Pakistan examines nurses' general experiences related to the effects of prolonged PACU stays[23]. Compared with previous studies, the current study focused on non-clinical factors that cause discharge delays. It explored PACU nurses' experiences and the impact that discharge delays have on their thoughts, feelings and daily work. Despite being a daily

event, PACU nurses felt stressed about discharge delays and frustrated because they could not do anything to prevent the problem. The participant narratives reveal that discharge delays from non-clinical factors constantly happen in the PACU, causing the work environment to become stressful. PACU nurses believe they are powerless to change the situation and accept it as a part of their work. The delays induce stress and negative emotions in PACU nurses which stretches and challenges their compassion for their patients and, if accumulated, can further exacerbate burnout and compassion fatigue[24, 25]. Studies in other nursing areas identified that burnout and compassion fatigue might negatively affect nurses' professional performance and psychological security at work.[8 ,24, 25, 26, 27]

***Stress and negative emotions***

PACU nurses in this study articulated that they experienced stress and negative emotions from the repeated discharge delays. Based on Lazarus's work on psychological stress and coping, Du *et al.* define stress as `as a relationship between individuals and environment that is appraised as personally significant and as taxing or exceeding resources for coping'[28]. A person is likely to experience high levels of stress when they can't control something that is significant to them[28]. All participants in this research expressed feeling stressed when stable patients could not be transferred out of the PACU as they knew that more patients would be leaving the ORs and would need to be cared for in the PACU. Their stress level increased as the delays frequently happened. Furthermore, PACU nurses experienced high stress when they felt pressured to receive new patients from the OR to the PACU despite a lack of available PACU bays. This experience of increased stress levels has been observed in primary healthcare, where nurses lack control in some situations[29].

In addition, PACU nurses in this study experienced feeling stressed when they needed to fit other tasks in with patient care. The primary role of PACU nurses is to monitor respiratory deterioration and examine the patient's respiratory, cardiovascular and neurological systems after anaesthesia and surgery[1]. However, it is difficult for PACU nurses to focus on their primary duties and responsibilities when patients cannot be discharged on time as PACU nurses need to attend to them. For example, PACU nurses need to ring catering and organise food for patients who have fasted for a long time before having surgery, as the PACU does not have proper food storage. In addition, PACU nurses need to contact the patients' destination ward to organise their discharge and get updates on when the ward can accept and pick the patients up from the PACU. These indirect care tasks increased workload and re-orientated PACU nurses' focus away from critical care, which is a nursing priority. As a result, PACU nurses feel frustrated as they cannot give patients appropriate care, making them upset and disappointed. The study by Lalani *et al.*[23] found that PACU nurses' time was consumed by indirect tasks, like becoming a transport nurse to help surgical wards transfer stable patients back, resulting in direct patient care being affected and the PACU being short staffed and therefore unable to receive new patients from ORs. Similarly, in general nursing practice, where direct nursing care includes patient hygiene and medication administration, stress develops from nurses needing to complete different tasks simultaneously, and not being able to focus on the required patient care [30, 31].

Discharge delays increased the stress levels of PACU nurses in this study as they wished to advocate for patients and provide care to support their recovery after surgery. However, a prolonged stay in PACU might delay the process of post-operative recovery for a patient, specifically for those patients who need same-day physiotherapy evaluation[5]. Early ambulation on surgery day benefits patients with less post-operative pain

and greater range of motion[5]. Study participants reported that patients in pain needed to wait unnecessarily to receive pain relief medicines as other PACU nurses were not available to check and prepare scheduled narcotic drugs while they were occupied with caring for stable patients who did not need to stay in PACU. Therefore, the participants felt patient care was compromised, and this induced stress.

Du *et al.*[28] report a relationship between stress and negative emotions. Negative emotions are 'an unpleasant, often disruptive, emotional reaction designed to express a negative effect'[32]. In the present study, PACU nurses reported negative emotions such as frustration, hopelessness, embarrassment and disappointment due to discharge delays. They believed stable patients waiting for discharge become anxious if they see other patients deteriorating in the PACU. As the situation in the PACU is highly unpredictable, the critical condition of other patients can generate concerns in stable patients[4] and PACU nurses felt they needed to apologise to patients and explain the reason for the discharge delay. PACU nurses were frustrated that discharge delays happened frequently and felt powerless to change this. The accumulation of continuous stress and negative emotions could cause nurses to burnout[30]. Many general and critical care nursing studies have shown that stress-induced burnout itself can increase the risk of missing essential nursing care and even cause errors[6, 30, 33]. Increased workloads and patient acuity have been identified as the main reasons for errors or omissions and these have the potential to be followed by adverse patient outcomes[8]. Considering the increased workload due to discharge delay in the PACU, it is expected that medication error and patient care omission may occur.

***Compassion for patients and compassion fatigue***

Compassion is defined by M. Simone Roach[34], p.50 as 'a way of living born out of an awareness of one's relationship to all living creatures'. Compassion is an essential component of the nurse-patient relationship, enabling nursing care to be based on empathy, respect and dignity[35]. Also referred to as intelligent kindness, compassion is critical to how patients perceive the care they receive[35, 36]. The narrative of PACU nurses in this study demonstrated their compassion for patients. Nurses in this study felt upset with the discharge delays that patients were experiencing and felt sorry that they had to keep patients waiting for discharge longer than expected in PACU. This is an example of PACU nurses showing their consideration and empathy for patients, and is consistent with a study by Ghaedi *et al.* that indicated the level of empathy in nurses is above average[37]. All participants in our study emphasised that having patients wait longer than expected before transfer to the ward was not the appropriate care they wished to provide. The empathy of PACU nurses allowed them to put themselves in the patient's position and understand their feelings. Kieft *et al.*[38] showed that patients consider continuity of care and smooth transitions as part of the quality of care experienced in the hospital.

The PACU nurses in this study believed the patient's journey from admission to discharge should be considered holistically and demonstrated compassion by reacting to patients' emotions and communicating patients' sentiments. For example, study participants said they did not want their stable patients to observe patients in PACU suffering from pain or post-operative nausea and deteriorating rapidly from airway obstruction. PACU nurses' also demonstrate compassion by shielding patients from negative emotions the nurses may have.

Since nurses are in a unique and powerful position to enhance the patient experience and quality of care, they are expected to fulfil patients' needs[36]. In general, a nurse's role involves intense interpersonal

contact and nurses are expected to show positive emotions and hide negative emotions[39]. The expectation of PACU nurses is the same; as a result, PACU nurses strive to hide their emotional responses - such as frustration or embarrassment as described in interviews - and express positive sentiments to patients[39]. In addition, since all patients in PACU have undergone a surgical trauma, PACU nurses may experience emotional, physical and psychological distress and are vulnerable to experiencing secondary traumatic stress from looking after patients who are suffering[25]. The participants in this study wished to provide high-quality, compassionate care to improve patients' health and well-being after anaesthetic and surgery. However, PACU nurses' are over-exposed to others' suffering and recurrent discharge delays contribute to stress in their work environment so their compassion may be exhausted over time, resulting in compassion fatigue[13, 25, 26, 27].

Compassion fatigue is `the convergence of secondary traumatic stress and cumulative burnout; a state of physical and mental exhaustion caused by a depleted ability to cope with one's everyday environment'[25, p21]. It impacts professional performance and workplace stability in the peri-operative environment. It can result in lack of interest in work and frequent absenteeism from sickness in nurses, and reduced retention and high staff turnover in health service organisations[25]

***Implications for practice***

The stress and negative emotions caused by discharge delays for non-clinical reasons on top of the demands of caring for critical post-operative patients can easily lead to burnout for PACU nurses. It can also result in reduced performance because of feelings of frustration and hopelessness. Therefore, understanding the experience of PACU nurses regarding discharge delays from non-clinical factors can provide insight into the impact of discharge delays on PACU nurses' performance and mental health. Improving PACU discharge flow would enhance PACU nurses' ability to provide adequate recovery care for patients and promote patients' safety after anaesthesia and surgery. Future studies should consider ways to address individual non-clinical factors that cause discharge delays and care for PACU nurses' mental health and well-being.

One strategy to improve in-patient discharge flow from the wards is establishing a discharge lounge. A discharge lounge allows patients to leave their ward beds, have their personal needs attended to, and wait safely for discharge thereby making ward beds available for new patients and reducing PACU discharge delays from bed block. However, the cost of implementing a discharge lounge needs to be considered, and its efficient function is worth exploring in future studies, especially in the private health sector[40]. Similarly, eliminating discharge delay will require collaboration between all relevant departments. Ward nurses might not be aware that discharge delays from the PACU to the wards affects flow in the OR and the whole surgical schedule. Staff awareness of the issues related to non-clinical factors responsible for discharge delays and the impact they have on the rest of the hospital may enhance a supportive environment.

***Limitations***

This study was conducted in one Australian private, for-profit hospital. The situation may be different in other hospitals and other healthcare contexts, particularly public and private, not-for-profit settings.

## CONCLUSION

Non-clinical factors, such as bed block, influence patients' length of stay in the PACU and may cause discharge delays. Although study participants accepted discharge delays as a part of their everyday work, they experienced feelings of stress and frustration from repeated discharge delays; in particular, they felt a lack of control regarding the delays. Participants also empathised with patients waiting longer than expected for discharge, which consequently affected PACU nurses' feelings at work. Understanding PACU nurses' perspectives on discharge delays highlights the need to reduce the non-clinical factors that contribute to discharge delay. Efficient discharge within the PACU would benefit patient flow and promote quality nursing care.

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# Looking Into The Green Surgical Future

**By Kate Woodhead, RGN, DMS**

## BACKGROUND

In this third article on Greener Surgeries, Kate investigates the Green Surgical Future

## INTRODUCTION

Understanding that the health of the planet and the health of it's populations are closely linked is a realisation we are beginning to come to terms with. Previous considerations in recent articles in this journal have indicated that there is a great deal of work to do if we are to contribute effectively to a net zero NHS. We are obliged by law to respond to the challenge by ensuring that by 2040 we have achieved 'net zero' for the emissions that the NHS controls directly, and 2045 'net zero' by the emissions the NHS has the ability to influence. It is said that NHS staff overwhelmingly support a greener NHS - almost nine out of ten support the 'net zero' ambition. Since 2010, the NHS has cut it's carbon emissions by 30%.

Since the publication of the report, *Delivering A Net Zero NHS* and strategy in 2020[1], good progress has been made. The NHS has performed the first 'net zero' delivery and surgery, has launched the first 'net zero' ambulance and embedded the response to climate change into the governance and strategy of every Trust. The government has invested £550-million in energy efficiency and renewable energy as part of the government's public sector decarbonisation scheme.

The aim of the report is ambitious, and includes:

- Delivering care closer to home, avoiding the carbon cost of travelling
- Programmes to avoid less appropriate procedures and linked carbon emissions
- Switching from disposable to re-usable equipment
- Using technologies to avoid plastics in medicine supply
- Working with pharmaceutical companies to reduce emissions from high carbon medicines such as inhalers and anaesthetic gases

Looking into the future, what can we expect from different elements of healthcare delivery and it's green agenda? Each Trust and Integrated Care Board has had to produce a three-year strategy, known as a Green Plan, which should set out it's objectives, aims and delivery plans for carbon reduction. Each Trust Board is required to have a 'net zero lead' to oversee the delivery of the plan.

## TEXTILES IN SURGERY

One of the interesting challenges for Trusts with a surgical service is whether to switch away from single-use, disposable gowns and drapes used in every procedure. They create mountains of waste, much of which has to be paid for to be incinerated, as they are likely to be contaminated by blood or body fluids. The benefits of

single-use drapes and gowns are that there is no possible consideration of any microbial contamination and therefore - to both the staff and patient - any risk of surgical site infections (SSI). So, the obvious question is, is there a safe re-usable textile that can be washed and returned to use?

There are two systems which might be of interest to Trusts. One is the option to rent packed and sterilised gowns and drapes, as well as tray wraps. The company which provides this service, and there is only one in the UK, states on it's website that:

- Re-usable gowns have up to 69% less global warming potential than disposables
- Re-usable gowns use up to 66% less energy resources than disposables
- Re-usable gowns use up to 61% less water than disposables
- Re-usable gowns generate up to 84% less clinical waste than disposables
- Reduced environmental emissions translate to greater carbon savings

Life cycle assessments can be processed for 75 washes for each gown. They meet the EN standard, 13795 for protection of the user, durability, fluid repellence and strength.

The final option for Trusts making decisions about single-use or re-usable textiles for use in surgery is to re-negotiate the laundry contract. The requirement for all the theatre textiles to be laundered and sent to sterile services following their cleaning puts stress on the capacity both of the laundry to wash, dry and fold, and sterile services to accommodate greater numbers of packs to be sorted and sterilised.

**PROCUREMENT**

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

Many of the suppliers to the NHS are small and/or medium-sized businesses. They have been set a huge challenge which many may not be able to meet. From April 2023, if a potential product or medical device contract is worth more than £5-million the NHS requires that supplier provide a carbon reduction plan for their UK scope 1 and 2 emissions. These requirements will be expanded over the next few years to include all the scope 1, scope 2 and scope 3 emissions as well as new requirements by 2028. This is being introduced to identify the carbon footprint of every product being supplied to the NHS. This is a big ask for the companies.

NHS England tenders for medicines will require at the point of submission, a valid evergreen sustainable supplier assessment, as well as a compliant carbon reduction plan. The assessment serves as a mechanism to show alignment with the NHS zero target and wider sustainability efforts.

Companies that belong to the Association British Healthcare Industries have reported that to conduct a lifecycle analysis for one product would cost $30 000 and a team of people. Expanded to their whole portfolio would equate to $30-million. The time and cost to undertaking these assessments is not considered reasonable or sustainable[2].

| TABLE 1 | | | |
|---|---|---|---|
| **SCOPE** | **DEFINITION** | **EXAMPLE** | **RESPONSIBLE FOR % OF NHS ENGLAND GHG EMISSIONS** |
| Scope 1 | GHGs directly from and controlled by an organisation | Anaesthetic gases Hydrofluorcarbons or chlorofluorocarbon propellants from metered dose inhalers | 5% |
| | | Direct emissions from combustion of petrol or diesel from NHS-owned or leased vehicles | 4% |
| | | Combustion of fossil fuels on-site such as within gas boilers | |
| Scope 2 | GHGs directly emitted due to energy purchased | Purchased as electricity, steam, heating or cooling | 10% |
| Scope 3 | All other GHGs | Supply chain including pharma and chemicals, medical equipment and non-medical equipment | 62% |
| | | Patient, visitor and staff travel | 10% |
| | | Water and waste disposal | 5% |
| | | Commissioned services | 4% |

**REPROCESSING**

There are many medical devices used during surgery and healthcare procedures which, over the last 20 years, have become single-use, disposable items. To move away from them in a wholesale way is an unknown process for procurement. It also creates a challenge in terms of assessing the capacity of the reprocessing facilities - which may be very difficult. Single-use products may be the best option from many different aspects including, but not limited to, sharpness, durability, clinically and environmentally-friendly solutions. For example, many have different components that cannot be reproduced as a


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re-usable item. It is not uncommon practice in the USA, for example, to send single-use, disposable items to companies set up specifically to be experts in reprocessing of these items. Many complex instruments such as cardiac catheters - which cost a great deal of money - are re-used on a different patient when they are returned to the hospital. The UK has long standing advice that this is not acceptable practice and will not be done, due to physical changes to some inherent components, particularly to plastics within the single-use instrument during the reprocessing mechanism.

***Infection Prevention and Decontamination***

Many of the reasons cited for using single-use items is that they carry no possibility of being the cause of infections. In surgery, where SSIs can cause serious harm to patients, increased length of stay and pain and suffering, surgical teams do not want to be the originator of potential harm. They want to be certain of the ethical and moral certainty of not causing any harm to the patient, as far as is humanly possible.

In the UK, there are strict decontamination and sterilisation quality standards which are vigorously protected and verified at many different stages of a product being reprocessed through sterile services. Teams and patients can trust that an item, or tray of instruments, that has been to sterile services is fit for purpose and meets the required standards. Critical medical devices require sterilisation, semi-critical devices need high-level disinfection or sterilisation, and non- critical devices should have low to intermediate level disinfection. Healthcare associated infections (HAIs) linked to re-usable medical devices are related to a failure to comply with the reprocessing guidelines[3].

***Waste Management***

Segregation of waste occurs within hospital practice, but could be a great deal better. Particularly in operating rooms (ORs) where it is said that 80% of the waste is collected before the patient arrives in OR. This indicates then, that there could be a recycling project that could prevent much of the clean paper waste being disposed of into bags. These bags are then incinerated, at considerable financial cost. This also demands that the waste management companies enable clean domestic waste to be recycled, which is not always available. There is a 2023 NHS clinical waste strategy[4] that sets out to reform the system by eliminating unnecessary waste, finding innovative ways to re-use waste, and ensure waste is processed in the most cost-effective, efficient and sustainable way.

***Use of Energy***

One of the more abstract areas of buildings management is the heavy demand for the use of electricity 24 hours each day. Protocols to switch these systems off when they are not in use would save the planet a great deal of energy. The anaesthetic gas scavenging system that removes gas from the local area during delivery of a gas-based anaesthetic to protect staff from the gases, could be switched off when the room is not in use. This is estimated to save or the equivalent of taking 51.6 cars off the road for one year.

In future, these systems may be motion sensor automated, detecting the room occupancy and automatically switching them off. The system for heating, lighting and air conditioning could, similarly, be part of the 'shut down' of an OR with great savings made on energy use. It can also allow for the room be retrofitted with motion sensors. It is estimated that we could save 66% of the energy consumption used by these systems.

***Reviewing The Instrument Trays***

A good deal of work on the contents of each instrument tray could be done to enable smaller trays can be used with fewer costs to re-processing and sterilisation. This review should be undertaken on a regular basis in any case, and should involve the surgical lead for each speciality, the OR Complex Manager and the Manager of the Sterile Services Unit.

The first chapter of this review needs to be the scrutiny and updating of the surgeon's preference cards relating to the instruments and - where possible - digitising of the system so it can be easily updated in the future to accommodate necessary changes. However, the backlog of any additional surgery is the cause of time pressures in surgery, and few of the 'extra' tasks being asked of peri-operative practitioners are being accomplished at present. As a result, they are on the 'to-do' list.

**CONCLUSION**

There is a great deal of extra work already being undertaken with reports and strategies for action, so that we - as professionals - have some guidance on the tasks which we need to undertake to contribute to the NHS 'net zero' target. It could not be a more important task and it could be that the first undertaking within the hospital is to find some enthusiastic champions who are willing to take a lead on local actions to help to deliver reductions in the carbon footprint of the hospital. They could be a link to the Trust lead who will motivate and oversee the progress being made. That being said, without doubt it will be down to each individual to contribute to the overall effort, creating a safer service for themselves and for their patients. And the greatest benefactor will be planet health.

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Our trade partners, in conjunction with the National Executive Board, have devised a series of instructive trade talks for delegates to attend as part of the innovative academic programme on offer. The talk will be hosted by the members of the trade where detailed explanations of products on offer, or methodologies to be used, will be explained (in detail) and questions answered. This will be your 'one-on-one' introduction to the latest technology available on the African continent - and you wil get first-hand knowledge of the benefits and advantages this can offer patients in your care.

APPSA is the foremost voice of peri-operative practitioners in the country, and we need both old and new members to join us at congressess and study days at all times. **Those APPSA members whose membership is paid up between 01 January 2024 and 30 April 2025 will qualify for a discounted member registration fee for the 2025 APPSA Congress, provided that full membership payment is effected before 15 April 2025.** If you are unsure as to whether you qualify, or if you have any other questions or queries, please contact the APPSA office at: congress@internext.co.za and we will clarify your queries.

As has been the tradition in the past, the APPSA Congress is a highlight of the peri-operative calendar in South Africa - from both an academic and a social point of view. We are hoping that this congress will be no different, but confirmation of the social programme will only be made known closer to the date, once exact numbers have been finalised.

**Dates: Friday 16 May 2025 to Sunday 18 May 2025**
**Venue: Premier Hotel, OR Tambo, Johannesburg**
**Theme: A Time For Excellence**

**CONGRESS SCHEDULE**

Friday, 16 May 2025

| | |
|---|---|
| 08:00 to 12:00 | Stand build-up for exhibitors |
| 12:00 to 15:00 | Delegate registration at Premier Hotel |
| 15:00 | Official Opening of the APPSA Congress 2025 |
| 18:00 | Welcome Function |

Saturday 17 May 2025

| | |
|---|---|
| 07:00 | Breakfast |
| 08:00 to 16:00 | Lectures (lunch break approximately 12:00 to 13:00) |
| 19:00 | APPSA Dinner |

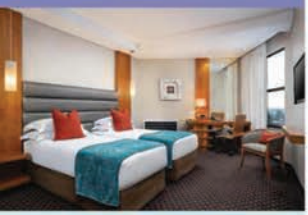
Sunday 18 May 2025

| | |
|---|---|
| 07:00 | Breakfast |
| 08:00 to 12:00 | Lectures. Packed lunch will be available for delegates to take with them |
| 12:00 | Delegates depart and exhibitors break down |

**ACCOMMODATION AND TRANSPORT**

*NOTA BENE:* ACCOMMODATION IS STRICTLY ON A 'FIRST COME, FIRST SERVED' BASIS. THE RATE IS **R1 750.00 PER PERSON PER ROOM**, OR **R2 000.00 PER ROOM FOR TWO PEOPLE SHARING**, BED AND BREAKFAST ONLY. **THE CUT OFF DATE FOR EARLY REGISTRATION AND HOTEL BOOKING IS 15 APRIL 2025.** IF THE HOTEL IS FULL, NO OTHER HOTEL ACCOMMODATION WILL BE OBTAINED. DELEGATES WILL THEN BE RESPONSIBLE FOR THEIR OWN ACCOMMODATION AND TRANSPORT TO AND FROM THE CONGRESS VENUE.







**AIRPORT TRANSPORT**

The Premier Hotel has a fleet of coaches and microbuses used for airport shuttles. Transfers to and from OR Tambo International Airport are free of charge. The Premier Hotel Shuttle can be found outside at the designated Hotel 'pick up' and 'drop off' point situated outside the terminal and Car Rental buildings. This point can be found opposite the Airport Intercontinental Hotel.

The shuttle times are as follows:

| From the Premier Hotel to the Airport | From the Airport to the Premier Hotel |
|---|---|
| 05:00 | 05:15 |
| 05:30 | 05:45 |
| 06:00 | 06:15 |
| Etc | Etc |
| Last bus: 23:45 | Last bus: 00:00 |

Directions to get to the shuttles:

1. Guests need to make their way to the entrance of the Car Rental Agencies
2. From there, you must look for the INTERCONTINENTAL HOTEL (It can be seen from across the parking lot from outside the Terminals where the flagpoles are)
3. Guests need to make their way past the Intercontinental Hotel
4. Immediately behind the hotel, delegates will find a parking area where the shuttle parks

Immediately after the congress ends on Sunday 18 May, 2025, a shuttle service will be available to transport delegates from the congress venue to the OR Tambo Airport. Please arrange your return flights to leave after 15:00 on the Sunday.

SHOULD YOU WISH TO MAKE USE OF ALTERNATIVE ACCOMMODATION OPTIONS, YOU WILL BE RESPONSIBLE FOR YOUR OWN TRANSPORT TO AND FROM THE ACCOMMODATION TO THE CONGRESS VENUE AND SOCIAL FUNCTIONS.

**APPSA CONGRESS 2025 REGISTRATION DETAILS**

**FULL REGISTRATION:**

| | **EARLY BIRD** *Before 15 April* | **STD REGISTRATION** *After 15 April* |
|---|---|---|
| APPSA Members | R3 200.00 (only paid up members 2024/25) | R3 700.00 |
| Non/New-members | R3 700.00 | R4 200.00 |
| Students* | R2 500.00 | R3 000.00 |

*To qualify for student rates, a certified statement attesting to your student status is required from your academic institution

**Full registration fee includes:**

- Attendance of all academic sessions
- Congress bag, including the Trade Feature and programme
- Lunch on each day of the congress
- Tea and refreshments
- Welcome function and Dinner

**DAY REGISTRATION**

| | |
|---|---|
| Friday | R1 100.00 |
| Saturday | R1 500.00 |
| Sunday | R1 100.00 |

**Day registration fee includes:**

- Admission to all academic sessions on the day of choice
- Congress bag, including the Trade Feature and programme
- Lunch on the day of attendance
- Tea and refreshments
- **EXCLUDES** the social function of the day on which you attend, the additional cost of the Welcome function is R500.00 and the additional cost of the Dinner is R600.00

On the accompanying APPSA Congress Registration Form, please indicate which day you will be joining us.

**REGISTRATION PROCEDURE:**

- The Registration Form must be completed in full
- The Congress Organisers will issue an invoice - in your name - upon receipt of your Registration Form. Payment must be effected against this invoice







- If you want the congress office to make out the invoice in your company/institution name, please supply the full details of how the invoice must be made out
- To avoid errors, please write your account number (which appears on the invoice) or initials and surname in the deposit reference block on the deposit slip or bank transfer
- Once you have submitted your Registration Form, you will receive email confirmation of your registration. You will also receive an invoice, for your records
- Any amendments to registration must be made in writing and directed to the Congress Organisers

**NO registration will be confirmed until the completed Registration Form and FULL payment has been received.** Electronic transfers should be made in favour of APPSA Congress trading as SATS Congress. Please note: The bank account details are the same as for the previous congresses and will appear on the invoice.

Unfortunately we DO NOT accept Government orders.

**BANK ACCOUNT DETAILS:**

| | |
|---|---|
| Account name: | APPSA trading as SATS Congress |
| Bank: | ABSA Bank |
| Account number: | 405 982 5362 |
| Branch code: | 632 005 |
| Type of Account: | Cheque |

**CANCELLATION POLICY:**

When effecting payment, please use your name and surname or account number (which appears on the invoice) as the reference. Only 50% of the registration fee will be refunded in the case of cancellations after 01 May 2025. No refunds will be made after 08 May 2025.

***Please Note:*** **If your accommodation and registration is not paid by15 April both your registration and accommodation will be cancelled without further notice.**

## We look forward to welcoming you

# EN13795 - Do your surgical drapes and gowns comply to the right quality standards?

Drapes and gowns provide an essential barrier to help preserve the sterile field during surgery. They protect healthcare workers' exposure to body fluids and potential infectious material, while preventing bacterial contamination of the surgical site.

With Hospital-Acquired Infections (HAI) affecting many patients at high cost to the healthcare system, it is vital to ensure that surgical drapes and gowns offer the best possible barrier protection.
**How do we ensure this?**

**EN 13795** is the European standards relating to general requirements, testing methods and specific performance levels for single-use and multiple-use surgical drapes, gowns and clean air suits. The standard is designed to ensure that a basic level of performance has been achieved in order for a surgical gown or drape to be classed as fit to use for a surgery.

**EN 13795** consists of three parts:
**Part 1: General requirements for manufacturers, processors and products**
- The scope includes testing requirements as follows:

| CHARACTERISTICS TO BE TESTED | GOWNS | DRAPES |
|---|---|---|
| Resistance to microbial penetration - Dry | ✓ | ✓ |
| Resistance to microbial penetration - Wet | ✓ | ✓ |
| Cleanliness - Microbial | ✓ | ✓ |
| Cleanliness - Particulate matter | ✓ | ✓ |
| Linting | ✓ | ✓ |
| Resistance to liquid penetration | ✓ | ✓ |
| Adhesion for fixation for the purpose of wound isolation | | ✓ |
| Busting strength - Dry and wet | ✓ | ✓ |
| Tensile strength - Dry and wet | ✓ | ✓ |

**Part 2: Test methods**
- This section stipulates the test methods that manufacturers or processors will have to complete in order to ensure that the device will comply with the requirements in parts 1 and 3 of the standard.

**Part 3: Performance requirements and performance levels**
- The levels of performance are selected as **'standard'** or **'high performance'** and are differentiated by critical and less critical areas on drapes or gowns.
- Standard Performance addresses the minimum performance requirements of medical devices, while High Performance addresses elevated performance requirements. These differ according to levels of mechanical stress, fluid levels and durations of surgical procedures.

**How is EN13795 relevant in choosing a theatre textile?**
This European standard lists uniform testing methods enabling you to compare material performances from the testing report and make an informative pre-selection of the available fabrics.

To arrange a consultation with PrionTex call the Cape Town office on 021 797 1878, Johannesburg on 011 237 5900 or visit www.priontex.com for more information.

PrionTex Healthcare Solutions

# Prevalence Of Surgical Site Infection Among Adult Patients At A Rural District Hospital In Southern Province, Rwanda

**By Deborah Mukamuhirwa, Omondi Lilian, Vedaste Baziga, Cecile Ingabire, Christian Ntakirutimana, Joselyne Mukantwari, Emerthe Nyirasafari, Vedaste Bagweneza, Innocent Ngerageze, Marie Christine Umutesi**

## INTRODUCTION

Globally, surgical site infections (SSIs) continue to cause morbidity and mortality to patients who have undergone surgical procedures[1]. Post-operative deaths related to SSI occur in more than one-third of post-operative patients globally[2]. The effects of SSI on the patients include discomfort, delayed wound healing, wound dehiscence, gas gangrene, and tetanus. The SSIs prolong the duration of hospital stay, place a high demand on medical resources, increase healthcare costs, and increase a financial burden to providers of healthcare services and the patients' families[1, 3]. Patients without any health insurance can be impacted by losing much money due to hospital bills.[3]

In the USA, an epidemic study done in 2010 in acute care hospitals showed that about 16-million surgical operations were performed, and SSI was the most common medical-related infection, accounting for 31% of all hospitalised patients with healthcare-associated Infection (HAI)[4]. The CDC HAI prevalence survey found 157 500 SSIs associated with in-patient surgeries in 2013[4]. In Europe, SSIs' prevalence ranged between 3.5% to 14.8%, with an average of 7.1% in 2008, which was the cause of an economic burden of €7-billion per year[5].

According to WHO results, developing countries, especially those in sub-Saharan Africa, are at a higher risk of developing SSI than developed countries[6]. The study done in Algeria and Tanzania found that in 2011, SSI incidence was 11.9% and 19.4% of operated patients, respectively. Another study in Tanzania identified that 35.6% of 118 surgical patients developed post-operative SSIs[10]. In Nigeria, the incidence of SSIs was 13% in 2012 at a tertiary hospital[6, 3]. The prevalence of SSI was 2.5% among patients who underwent orthopaedic surgery at King Fahd Hospital of a University in Saudi Arabia[9].

A study conducted at three public hospitals in Cameroon showed that the prevalence of SSI was 9.2% among patients who had underwent surgery, and the predominant SSI type was superficial[10]. The study done in sub-Saharan Africa at Nnamdi Azikiwe University Teaching Hospital, Nnewi, Nigeria revealed SSI prevalence of 15.5%[3]. In Rwanda, a study done in a teaching hospital in 2015 among women with Caesarean section, SSI prevalence was at 4.9%[8], and the rate increases to almost 11% if the late SSIs are included[12].

The commonly identified risk factors for SSIs increased morbidity and mortality among operated patients were diabetes and obesity (1.95 times) in the USA[9], and HIV/AIDS in Tanzania[10]. Other factors may be associated with the surgeon's skill, like poor operation procedures, improper haemostasis, and the existence of dead space[9].

The studies looking for SSI should be done periodically to identify associated risk factors and enhance national prevention measures[6]. In Rwanda, 32 944 patients underwent surgery at the district level in 2010[11], and SSI cannot be ruled out. The Kabgayi annual report of 2015/2016 shows that about 2 521 patients underwent surgery, but no retrieved study addressed SSI. That is why this study aimed to determine the prevalence of SSI among adult patients who underwent surgery at Kabgayi hospital.

## METHODS

*Study design and setting*

We conducted a two-month cross-sectional study at the Kabgayi District Hospital from 13 February to 12 April 2017 to determine the prevalence of SSIs among adults who underwent surgery. The study took place in the gynaeco-obstetrical and surgical units at the Kabgayi District Hospital located in the Southern Province of Rwanda, Muhanga District. Kabgayi District Hospital is a Muhanga District Hospital.

The hospital provides different services, including out-patient consultation for surgery; maternity; dentistry; mental health; ophthalmology and other pathologies; and hospitalisation. There are surgical, paediatric, emergency, maternity, neonate and internal medicine wards. The hospital also has paraclinical services catering to GBV, physiotherapy, medical imagery, and laboratory services. Other units include administration, social service, and hygiene and nutrition services.

The hospital has a bed capacity is 372; two operating theatres, one reserved for general cases and the other reserved for gynaeco-obstetric patients. It has capacity to carry out 210 surgical operation per month. The Kabgayi District Hospital's annual report of 2015/2016 showed that 2 521 patients underwent surgery. Among them 1 965 were of gynaecology and obstetrics, while 556 were general surgeries.

*Study population and sample size*

The study population included patients who underwent surgery at Kabgayi District Hospital. The target population was 420 patients, corresponding with the number of surgeries that the hospital expected to do. To be included in the study, the respondent had to meet the following criteria:

- Have undergone surgery
- Be aged 18 years and above
- Accepted to voluntarily participate in the study
- Be fully aware and understand the concept of informed consent

The patients were excluded if they were under 18 years, critically sick and unconscious, or refused to participate. A sample size was calculated using the formula $N=(Z)^2. p .q/(d)^2$ [15]. A sample size of 135 participants was obtained where N = wanted sample size; Z = standard deviation 1.96 at 5% level, which is equivalent to 95% level of confidence; p= expected proportion of SSI in population-based on previous

studies. In this study, P was 15.5% (in other words, 0.155)[2]; q = 1- p= 1-0.155=0.845, d = Absolute error and in this study it was 5% (i.e., 0.05). Estimated sample size therefore, was: N=(1.96)2.(0.155).(0.845)/(0.05)2=201.

As the study population was less than 10 000 to adjust sample size the following formula was used nf=n/1+(n)/(N) Where,

- nf = wanted sample size, if size of population N < 10,000
- n = wanted sample size, when size of population, N > 10,000
- N = estimated size of population

In this study estimation population will be 420 and the sample size will be nf=420/[1+(420/201)]=135[15].

*Sampling technique*

Convenient sampling strategy was used where the researcher picked population who met the criteria. During data collection, the number of patients admitted in the surgical unit was slightly lower than expected due to the unprecedented ill health of the surgeon. The surgeon's ill health led to a higher number of surgical cancellations and referral of emergence cases to other hospitals for a period of three weeks during the time of data collection. Therefore, we recruited all the available patients who met the inclusion criteria for the study. This totalled 122 patients.

*Data collection instrument and procedure*

We used a questionnaire specifically prepared to collect the data from patients and records in their medical files. The questionnaire was developed by Surgical Site Infection Surveillance Service in England[12] and validated by the European Centre for Disease Prevention and Control (ECDC) in 2012.

This tool contained several sections; the first section contained the general information regarding the patient's demographic data and health condition (co-morbidities). The second section dealt with the American Society of Anaesthesiology (ASA) score[17] and the CDC wound classifications[18]. The third section was concerned with collecting data related to surgery, including type of surgery, duration of surgery, type of anaesthesia given, and amount of blood lost. The last section described SSIs. The questionnaire content validity was established through the a team meeting that evaluated its completeness to answer the study objectives.

We conducted a pilot study among patients who had undergone surgery in surgical and maternity wards for questionnaire reliability. 10 patients were used for the pilot study. The reliability of the tool was measured by the author and had a 0.73 Cronbach alpha score. The data from the pilot study was not included in the final analysis.

After getting administrative permits and individual consent, we conducted interviews directly with the surgical patients using the structured questionnaire, complemented with the patients' records in the medical files.

*Data analysis*

SPSS version 20 was used to summarise and analyse the collected data. The first step was a descriptive

presentation of data with frequencies and percentages. The second step was to test the association between having an SSI and demographic and surgical characteristics using Fisher's exact test. Multivariable logistic regression was used to determine independent factors for post-operative SSIs.

*Ethics considerations*

This study was approved by the Institutional Review Board (IRB) of the University of Rwanda, College of Medicine and Health Sciences (CMHS/IRB/039/2017). Participation in this study was voluntary. Data collection from selected patients started after receiving signed informed consent from the patients. Neither name nor location of the participants was mentioned on the questionnaire, and the recorded electronic data were protected with a password.

*Results*

One hundred and twenty two (122) surgical patients responded to the study. As shown in Table 1, close to half of the respondents (48.4%) were aged between 28 and 37 years old, and 86.1% were females. The majority of them had stayed in hospital for less than five days before the surgery and one-to-five days after the surgery.

The majority (92.6%) of the patients had been referred, and most participants were HIV-negative (96.7%); 97.5% did not smoke; and 75.4% of patients were in normal nutritional status. In addition, 91.8% of the patients were in normal health status (ASA score 1); 77% had wounds in the clean-contaminated category at the end of the surgery. According to surgical characteristics, 63.9% of the patients were emergency cases; 91% of the surgeries were non-traumatic, 87.7% and abdominal; 97.5%, operated under a local anaesthesia; and 59.8% had lasted less than one hour. All the patients had received antibiotic prophylaxis within 60 minutes before surgery, and 85.2% had lost less than 500ml of blood (See Tables 1A & B).

Among 122 respondents, the study identified SSIs among 10 cases (8.2%), and the patients who underwent Caesarean section were more affected - 9 (90%).

**FIGURE 1. Prevalence of surgical site infection**

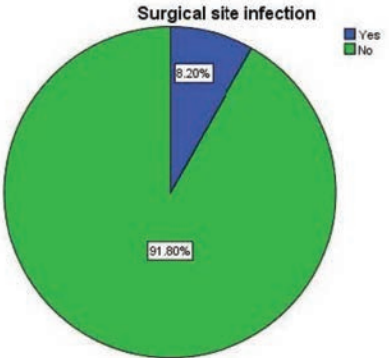


**TABLE 1A. DEMOGRAPHIC CHARACTERISTICS**

| Patients characteristics | Frequency | Percentage (%) |
|---|---|---|
| **Age** | | |
| 18-27 | 39 | 32.0 |
| 28-37 | 59 | 48.4 |
| 38-47 | 16 | 13.1 |
| 48-57 | 7 | 5.7 |
| >57 | 1 | 0.8 |
| **Total** | **122** | **100.0** |
| **Sex** | | |
| Male | 17 | 13.9 |
| Female | 105 | 86.1 |
| **Total** | **122** | **100.0** |
| **Hospital stay before operation** | | |
| <1 day | 55 | 45.1 |
| 1-5 days | 56 | 45.9 |
| >5 days | 11 | 9.0 |
| **Total** | **122** | **100.0** |
| **Days post-operation** | | |
| 1-5 days | 108 | 88.5 |
| 6-10 days | 6 | 4.9 |
| >10 days | 8 | 6.6 |
| **Total** | **122** | **100.0** |
| **Referred** | | |
| Yes | 113 | 92.6 |
| No | 9 | 7.4 |
| **Total** | **122** | **100.0** |
| **Patient HIV status** | | |
| Positive | 4 | 3.3 |
| Negative | 118 | 96.7 |
| **Total** | **122** | **100.0** |
| **Patient nicotine use** | | |
| Yes | 3 | 2.5 |
| No | 119 | 97.5 |
| **Total** | **122** | **100.0** |
| **Patient nutritional status** | | |
| Normal | 92 | 75.4 |
| Obesity | 28 | 23.0 |
| Malnutrition | 2 | 1.6 |
| **Total** | **122** | **100.0** |

**TABLE 1B. SURGICAL CHARACTERISTICS**

| Patients characteristics | Frequency | Percentage (%) |
|---|---|---|
| **ASA Score** | | |
| ASA 1 | 112 | 91 |
| ASA 2 | 9 | 7.4 |
| ASA 3 | 1 | 0.8 |
| **Total** | **122** | **100.0** |
| **Class of wound** | | |
| Clean | 17 | 13.9 |
| Clean–contaminated | 94 | 77.0 |
| Contaminated | 4 | 3.3 |
| Dirty or infected | 7 | 5.7 |
| **Total** | **122** | **100.0** |
| **SURGICAL FACTORS** | | |
| **Type of surgery** | | |
| Elective | 44 | 36.1 |
| Other | 78 | 63.9 |
| **Total** | **122** | **100.0** |
| **Area of surgery** | | |
| Abdomen | 107 | 87.7 |
| Limb | 15 | 12.3 |
| **Total** | **122** | **100.0** |
| **Prophylaxis within 60 minutes** | | |
| Yes | 122 | 100.0 |
| **Total** | **122** | **100.0** |
| **Procedure** | | |
| Appendectomy | 1 | 0.8 |
| Osteosynthesis | 8 | 6.6 |
| Hernia | 8 | 6.6 |
| Caesarean section | 93 | 76.2 |
| Hysterectomy | 1 | 0.8 |
| Laparotomy | 1 | 0.8 |
| Other | 10 | 8.2 |
| **Total** | **122** | **100.0** |
| **Bleeding** | | |
| Normal(<500 ml) | 104 | 85.2 |
| Abnormal (>500ml) | 18 | 14.8 |
| Hernia | 8 | 6.6 |
| **Total** | **122** | **100.0** |
| **Type of anaesthesia** | | |
| General anaesthesia | 3 | 2.5 |
| Local anaesthesia | 119 | 97.5 |
| **Total** | **122** | **100.0** |

*Association between patients'characteristics and SSIs*

Factors associated with SSI were determined using chi-square statistics, and only HIV status was also found to be associated with SSI (Fisher's exact test: 9.604; P-value: 0.033). As the sample size was small, Fisher's exact test was used to check the association between SSI and related risk factors (See Table 2)

**TABLE 2. BIVARIATE ANALYSIS TO DETERMINE SURGICAL AND PATIENTS' FACTORS ASSOCIATED WITH SURGICAL SITE INFECTION**

| **Patients factors** | **SSI** | | | |
|---|---|---|---|---|
| | **Yes (%)** | **No (%)** | **Chi-square*** | **P-value** |
| **Age** | | | 4.402 | 0.325 |
| 18-27 | 6(15.54) | 33(84.6) | | |
| 28-37 | 4(6.8%) | 55(93.2) | | |
| 38-47 | 0(0.0) | 16(100) | | |
| 48-57 | 0(0.0) | 7(100) | | |
| >57 | 0(0.0) | 1(100) | | |
| **Hospitalisation days before operation (df:2)** | | | 0.438 | 0.896 |
| <1 day | 5(9.1) | 50(90.9) | | |
| 1-5 days | 4(7.1) | 52(92.9) | | |
| >5 days | 1(9.1) | 10(90.9) | | |
| **Patients HIV status** | | | 9.604 | 0.033* |
| Positive | 2(50) | 2(50) | | |
| Negative | 8(6.8) | 110(93.2) | | |
| **Patient nicotine use** | | | 0.275 | 1.000 |
| Yes | 0(0.0) | 3(100) | | |
| No | 10(8.4) | 109(91.6) | | |
| **Patient nutritional status** | | | 4.456 | 0.116 |
| Normal | 5(5.4) | 87(94.6) | | |
| Overweight or obese | 5(17.9) | 23(83.1) | | |
| Underweight or malnutrition | 0 | 2(100) | | |
| **ASA Score** | | | 3.558 | 0.231 |
| ASA 1 | 8(7.1) | 104(92.9) | | |
| ASA 2 | 2(22.2) | 7(77.8) | | |
| ASA 3 | 0(0.0) | 1(100) | | |
| **Wound class** | | | 2.179 | 0.472 |
| Clean | 0(0.0) | 17(100) | | |
| Clean – contaminated | 9(9.6) | 85(90.4) | | |
| Contaminated | 0(0.0) | 4(100) | | |
| Dirty or infected | 1(14.3) | 6(85.7) | | |
| **SURGICAL FACTORS** | | | | |
| **Type of surgery** | | | 0.073 | 0.787 |
| Elective | 4(9.1) | 40(90.9) | | |
| Emergency | 6(7.7) | 72(92.3) | | |

**#= Fisher's exact test; *P<0.05**

**TABLE 2. BIVARIATE ANALYSIS TO DETERMINE SURGICAL AND PATIENTS' FACTORS ASSOCIATED WITH SURGICAL SITE INFECTION**

| Patients factors | SSI | | | |
|---|---|---|---|---|
| | Yes (%) | No (%) | Chi-square* | P-value |
| **SURGICAL FACTORS** | | | | |
| **Area of surgery** | | | 0.053 | 0.818 |
| Abdomen | 9(8.4) | 98(91.6) | | |
| Limb | 1(6.7) | 14(93.3) | | |
| **Operation due to trauma** | | | 1.079 | 0.299 |
| Yes | 0(0.0) | 11(100) | | |
| No | 10(9) | 101(91) | | |
| **Procedure** | | | 3.629 | 1.000 |
| Appendectomy | 0(0.0) | 1(100) | | |
| Osteosynthesis | 0(0.0) | 8(100) | | |
| Hernia | 0(0.0) | 8(100) | | |
| Caesarean section | 9(9.7) | 84(90.3) | | |
| Hysterectomy | 0(0.0) | 1(100) | | |
| Laparotomy | 0(0.0) | 1(100) | | |
| Other | 1(10) | 9(90) | | |
| **Blood loss** | | | 1.885 | 0.17 |
| Normal (-<500ml) | 10(9.6) | 94(90.4) | | |
| Abnormal (>500 ml) | 0(0.0) | 18(100) | | |
| **Type of anaesthesia** | | | ** | 1.00 |
| General anaesthesia | 0(0.0) | 3(100) | | |
| Local anaesthesia | 10(8.4) | 109(91.6) | | |
| **Duration of operation** | | | 1.671 | 0.47 |
| <1hour | 8(11) | 65(89) | | |
| 1-2 hours | 2(4.3) | 44(95.7) | | |
| >2 hours | 0 | 3(100 | | |

**#= Fisher's exact test; *p<0.05**

*Multivariable analysis for factors associated with SSI.*
The risk of developing SSI for the patients with HIV-positive status was found to be 14 times compared to those with HIV-negative status (OR: 13.7, P-value: 0.014, CI: 1.7053; 19.8652)

## DISCUSSION

In this study, the analysis of the demographic variables of the patients revealed that the females operated on were the majority, at 105 (86.1%) out of 122 participants. This may be partially explained by the fact that the number of patients recruited from the gynaeco-obstetrics unit was more than those recruited from the other surgery units. These results were similar to what were found in the study conducted at

Alshaab Teaching Hospital in Khartoum, Sudan[12]. In addition, Caesarean deliveries accounted for more than 60% of surgeries that took place at district level hospitals in Rwanda[20]. The higher number of gynaecology and obstetrics surgeries in the present study explains why the majority of respondents were 18 to 47 years old, corresponding to childbearing age (between 15 and 49)[21]. Therefore, differences in surgical procedures on patients may partly explain age differences among Iranian[13], Cameroonian[14], and Ethiopian[13] studies.

The rate of SSIs in the present study was found to be 8.2%, which was slightly similar to the results found in a study done in Cameroon (9.16%)[14], on the prevalence of SSIs and the evaluation of risk factors after surgery.

**TABLE 3. MULTIVARIABLE ANALYSIS FOR FACTORS ASSOCIATED TO SSI AMONG PATIENTS WHO UNDERWENT SURGERY AT KABGAYI HOSPITAL**

| Variable | OR | 95% CI | p-Value |
|---|---|---|---|
| **HIV status** | | | |
| Negative | 1 | | |
| Positive | 13.7 | [1.7053; 19.8652] | 0.014 |
| **Operation due to trauma** | | | |
| No | 1 | | |
| Yes | 0.368 | [0.044; 3.038] | 0.299 |
| **Blood loss** | | | |
| Normal (-<500ml) | 1 | | |
| Abnormal (>500 ml) | 0.269 | [0.048; 1.516] | 0.17 |

**N= 122, outcome : SSI , *p<0.05, OR: odd ratio**

A lower rate of infection (2.5%) was reported in a study conducted at King Abdulaziz Airbase Hospital, Dhahran in Saudi Arabia, on the prevalence of SSIs in orthopaedic surgery[16]. The highest SSI risk was reported in a study conducted at Osaka City University Hospital in Japan on the Nutritional Risk Index as an independent predictive factor for the development of an SSI after parathyroidectomising. In this study, most of the patients stayed in the hospital for between one day to five days before operation (45.9%); and an SSI was predominant in the patients hospitalised less than one day and those hospitalised over five days with 9.1% for each. Pre-operation hospital stay was not found to be associated with increased risk of SSI; this was different from the results found in the study conducted at a tertiary care hospital in Western India[18]. However, some factors such as prolonged post-operative follow up that helped capture late SSIs symptoms, prolonged hospitalisations before surgery, health status differences in study participants contribute so much to the differences[11, 24]. The study identified the majority of SSI (79%) after discharge, and yet the current study focused on hospitalised patients, and the majority had stayed one to five days after surgery[25].

HIV-positive status was found to increase the risk for an SSI. The results were similar to the study done on predictors of SSIs among patients undergoing major surgery at Bugando Medical Centre in North-Western Tanzania and the study conducted on risk factors of an SSI at Muhimbili National Hospital, Dar es Salaam,

Tanzania, where it was found that the rate of an SSI was significantly higher in HIV-positive patients than patients with HIV-negative status[19, 20]. It is clear that HIV increases the susceptibility to infection as it plays a vital role in weakening the host immune system. This study revealed that nutritional status (obesity or malnutrition), was not associated with increasing the risk of SSI. These results were similar to the results found in the study done about SSI risk factors on abdominal surgery, where they found that there was no significant association between obesity, malnutrition and SSI ($p = 0.692$)[13]. Contrary results were found in another study done on predisposing factors of SSI after heart surgery, where they found that obesity and malnutrition increased the risk for an SSI[21].

According to the ASA score, most of the patients with SSI had ASA score 1, 112 (91.8%) out of 122. These findings were similar to the findings of the study done on risk factors and the cost of developing an SSI after primary hip arthroplasty in Norway. Maybe this was due to the area of surgery[22],but the association between ASA score and SSI were statistically insignificant (p value> 0.05). Contrary results were found in the study conducted in Cameroon on risk factors of SSI where there was a significant association between SSI rate and ASA score[14].

Most of the wounds in the current study (77%) were classified as clean-contaminated, out of which only 9 (9.6%) had SSI, and wound class was not found to increase a risk to SSI. Elsewhere, contrary results were found in the study assessing risk factors of SSI after abdominal surgery[13]. This may be due to a systematic administration of antibiotics within 60 minutes before surgery. In addition, the study focused only on abdominal sites, contrary to the present study that involved various operation sites.

In this study, most patients underwent emergency surgery 78 (63.9%), and SSI among patients who underwent elective surgery was found to be 4 (9.1%) out of 44 cases. However, the association between type of surgery and SSI was insignificant (P value >0.05). Similar results were found in a study done in Cameroon on risk factors of SSI[14]. In this study, a small number (9%) of respondents underwent surgery due to trauma, and the association with SSI was not significant. The contrary results were found in a study done in England in Royal Surrey County Hospital, on SSI after arthroplasty of the hip, where they reported a significant association between operation due to trauma and SSI[23]. The explanation is that most orthopaedic cases resulted from physical harm, injured by dirty objects and skin openings are likely to last longer compared to surgically created wounds, which make them vulnerable to infections. Unlike the present study, the most performed procedures were not due to trauma. Therefore, all of the participants received antibiotics prophylaxis within 60 minutes before their operation and good preparation before their operation.

Caesarean section was the most performed procedure at 76.2% of the122 participants. This finding was similar to the findings in a retrospective review of national data in Rwanda on Surgical Volumes at a District Hospital[25], but the association between surgical procedure and SSI was not significant (p value>0.05). In this study, blood loss during surgery in all the cases of SSI was in the normal range (≤ 500ml), and the association between SSI and blood loss was not statistically significant (p >0.05). Different results were found in the study conducted at a university-affiliated tertiary care centre in China on Risk Factors For SSI[22]. In this study, most patients were operated on under local anaesthesia (97.5%), and there was no association found between the type of anaesthesia used and SSI. These results were similar to the results found in a study conducted at a university-affiliated tertiary care centre in China on

Risk Factors For SSI[22]. Most (59.8%) operations were performed in less than an hour, and this is attributed to the great number of patients who underwent Caesarean section compared to other procedures. Patients with SSI were 8 (11%) among patients with the operation of less than one hour, but the association between the duration of operation and SSI was not significant. These results were different from the results found in the study done on incidence and risk factors for SSI after gastric surgery, where prolonged operation time was a risk factor for SSI after gastric surgery[26].

*Limitations of the study*

This study was limited only to patients and risk factors for SSI. A small and non-probability sample limits the generalisation of study findings to other hospitals in Rwanda. In addition, the study did not follow up the study respondents after discharge. The numbers of reported SSIs are likely to increase about 60% if post-discharge surveillance lasts up to 30 post-operative days[11].

## CONCLUSION

In this study, the prevalence of SSI was 8.2% before patients discharge. HIV positivity was found to be a risk factor for SSI. It is observed that the prevalence of SSI is high as it is likely to increase with post-discharge surveillance. Therefore, there is a need for enhancement of prevention measures, early detection, and treatment will reduce the co-morbidities for infected patients.

Special consideration to HIV-positive patients would reduce the risk for SSIs morbidity, mortality and associated financial costs.

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# MEDICINE AND THE LAW:

## What's In and What's Out? Recommendations for developing a legally-sound health technology assessment for South Africa's National Health Insurance

**By Professor Salim Abdool Karim**

**BACKGROUND**

On 15 May 2024, the National Health Insurance Act No. 20 of 2023 was signed into law, and South Africa officially adopted a National Health Insurance (NHI) system as part of its efforts to achieve universal healthcare across the country. While NHI has been controversial and much talked about, plenty of how the scheme will operate remains an unknown, and has not been defined within the Act. However, it is evident that, with SA's limited healthcare budget, the NHI scheme is not going to cover everything for everyone.

Some decisions will need to be made about what kinds of healthcare and other benefits South Africans can expect to have covered by the scheme - in other words, decisions about what will be included under NHI and what will be excluded. This paper does not aim to discuss the constitutionality or legality of the NHI Act, but focuses only on the issue of how Government ought to consider making decisions about what services the NHI covers.

The National Health Insurance Act No. 20 of 2023[1] proposes to make decisions about what services to cover using a mechanism called Health Technology Assessment (HTA). This article will explain what HTA is, and what HTA system the NHI Act envisages. It will then analyse the HTA system in the Act to outline some of the shortcomings in the HTA process from a legal perspective, and present recommendations of how to create a legally robust HTA scheme for NHI in South Africa.

**WHAT IS HTA?**

HTA is often relied upon to make a range of decisions about healthcare. This is not unique or specific to NHI schemes and, in South Africa, is currently used to determine, for example, what the prescribed minimum benefits (PMB) under medical aid schemes should be or which medicines should be included on the essential medicines list[2]. When employed, HTA systems have a significant impact of the kind and type of healthcare people receive[3]. However, the current system of fragmented and *ad hoc* HTA would not be fit for purpose in use for the NHI scheme.

Consequently, the Act proposes the creation of a dedicated HTA Agency for NHI services. This is in line with the approach adopted in a number of other countries that have, in the process of implementing universal health coverage, created semi or completely independent bodies to conduct HTA to determine which healthcare interventions ought to be provided to patients[3]. Under NHI, this HTA Agency will 'review the range of health interventions and technology by using the best available evidence on cost-

effectiveness, allocative, productive and technical efficiency and health technology assessment.[4'] In layman's terms, the NHI HTA Agency will determine, among other things, whether specific health technologies should be included or excluded from the NHI benefits package. The kinds of criteria the proposed NHI Advisory Council and agency will use to make decisions represent a significant departure from the status quo of *ad hoc* HTA used elsewhere in South Africa. The anticipated powers of this HTA Agency will have more far-reaching impact than simply allowing a technology or service to be provided - it will determine what kinds of healthcare South Africans have access to. This article now turns to discuss the HTA process outlined in the Act.

**WHAT DO WE NOW ABOUT HTA FOR THE NHI SCHEME?**

The criteria and process for HTA bodies are variable, and not much is known about the proposed NHI HTA system[3, 5]. Internationally, the considerations in HTA may be limited to the safety and efficacy of the intervention and burden of diseases, or include more expansive criteria such as cost-effectiveness, socio-economic impact and ethical implications[5].

A typical HTA process consists of four phases:

(i) topic selection, which is the process of determining which technologies and services will go through an HTA process for inclusion or removal from the scheme;
(ii) analysis, which would involve gathering data on the technology, including its effectiveness, cost, budget impact and cost-effectiveness;
(iii) appraisal, which is the process of evaluating the technology against a set of criteria to assess how it performs; and
(iv) decision-making, where a final decision is made on whether the technology or service should be provided or removed from the healthcare system[2].

It should be noted that the Act does not provide detail of what the NHI's HTA process would look like. This article seeks to provide a suggested model adapted from a traditional HTA process.

Details on the role of HTA in the NHI scheme and, more importantly, the specific criteria to be used to evaluate interventions, are outlined to a limited degree in the NHI Act. The Act envisages the establishment of an HTA Committee that will advise the Minister of Health, but this committee will be a precursor to a formal HTA Agency. The White Paper on NHI provides slightly more background to the intended purpose and role of an HTA body. Specifically, the White Paper contemplates a multi-disciplinary team that will review health interventions for cost-effectiveness, a range of efficiencies as well as HTA[6]. The White Paper defined HTA 'as a systematic evaluation of properties, effects, and/or impacts of health technology' that evaluates the 'social, economic, organisational and ethical issues of a health intervention or health technology.[6']' The role of HTA is highlighted as being critical to mitigating corruption and ensuring that healthcare services are affordable, cost-effective and supported by scientific evidence, as well as ensuring the sustainability of the NHI by ensuring efficient use of resources.

In both the White Paper and Act, the HTA process considers traditional criteria of efficacy and safety of interventions, as well as cost-effectiveness. Although these criteria are the cornerstone of an HTA process, they are insufficient on their own. Specifically, the current conceptualisation of HTA fails to account for

some the legal, and specifically human rights, implications of an HTA decision, and the potential consequences of decision-making. This poses a significant risk to both the robustness of the HTA system and, more importantly, to the sustainability and feasibility of the NHI scheme. This article now turns to discuss the legal issues that should be considered in developing an HTA process.

## LEGAL CONSIDERATIONS IN HTA DECISION MAKING

A handful of studies have included consideration of the legal dimensions of an HTA, and these recognise that the legal issues that arise in HTA are both significant and context-specific[7, 8, 9]. When an HTA body makes a decision, it is susceptible to being reviewed and even set aside by a court. **This has meant that, in some countries, priority-setting and allocation decisions taken by HTA bodies and governments have been challenged and set aside through legal action.**

This poses significant risks to the feasibility and budget allocation process as, in some cases, governments have been forced to budget the funding of expensive drugs and technologies, resulting in less funding available for other essential services[10, 11]. For this reason, the standard HTA process should be adapted to include three legal dimensions: the consideration of constitutional rights; the principles of good decision-making; and the procedural requirements of the Promotion of Administrative Justice Act[12] (PAJA), which are added to the standard HTA process in Figure 1. Each of these additions will be discussed in further detail.

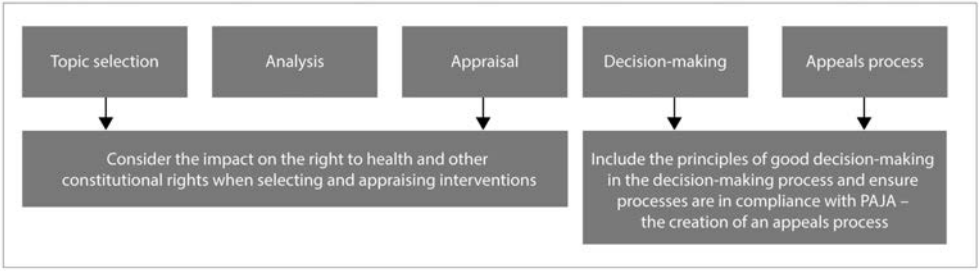


*Fig. 1. A proposed process for a legally compliant health technology assessment process. (PAJA = Promotion of Administrative Justice Act No. 3 of 2000.)*

### *Constitutional considerations*

Since the HTA process will decide what healthcare services are made available or removed, the process will have a significant impact on the right to health[11]. Under SA's constitutional dispensation, the Constitution[13] is the supreme law of the land. This means that decisions will have to align with the Government's obligations under the Right to Health, and the Constitution more broadly. For example, under Section 27 of the Constitution, the Government has an obligation to progressively realise the right to access healthcare - this requires that the Government work towards increasing access to healthcare, and cannot take away existing access people may have. In addition, there is a particular mention of reproductive healthcare.

When healthcare technologies, treatments or interventions are excluded from the NHI benefits packages, it means that they will not be provided at state expense. This has the effect of making these interventions inaccessible, either physically or economically, to a large portion of the South African population.

Exclusion decisions, particularly as a result of a review by the HTA Committee, could undo existing access to healthcare and so infringe on an individual's rights. In particular, the Government will need to justify why the removal of services people already have access to is not regressive, or those decisions may be found to be unconstitutional and invalidated by the courts[14]. Conversely, rights can be equally important in guiding inclusion decisions. Looking at whether a decision that supports the positive obligations imposed by Section 27 could be used to ensure that healthcare decisions lead to progressive realisation of a right. The effect of this is that, from the outset of the HTA process, topic selection of the technologies must ensure that the technologies being selected for evaluation progress rather than regress the right to health. For this reason, how the decision impacts people's rights should be considered as a component of the appraisal process.

In addition, a constitutionally-compliant HTA system will also need to ensure that decisions are rational and reasonable - which requires that decisions be evidence-based and not discriminatory[14, 15]. This impacts the kinds of considerations that may be factored in when appraising the technology. In particular, it may not be sufficient to consider only the cost of a product: the Government may also need to consider whether the kinds of technologies being considered favour particular groups, and whether the distribution and type of healthcare services being offered as a whole are equitable. For example, where an intervention is not as cost-effective but leads to a more equitable distribution of healthcare services and lessens inequality, including it can assist the state in meeting its right to equality obligations[15]. In addition, explicitly including consideration of the rights implications of an exclusion or inclusion decision can assist in justifying the decision if it is later challenged.

Consequently, there is a strong case for including the constitutional rights implications as part of the topic selection and appraisal criteria to not only support the realisation of constitutional rights, but also to improve the robustness of the HTA process.

***Principles of decision-making***

Beyond drawing on our legal framework to ensure that the substantive decisions align with Government's constitutional obligations, our legal system also imposes certain procedural and process requirements on decision-making. Irrespective of whether the NHI HTA body is an independent decision-maker or provides recommendations for the Minister of Health to act upon, HTA decisions will be subject to the principles for good administrative decision-making contained in Section 195 of the Constitution[13],[13] which states:

*'Public administration must be governed by the democratic values and principles enshrined in the Constitution, including the following principles:*

*(a) A high standard of professional ethics must be promoted and maintained*
*(b) Efficient, economic and effective use of resources must be promoted*
*(c) Public administration must be development oriented*
*(d) Services must be provided impartially, fairly, equitably and without bias*
*(e) People's needs must be responded to, and the public must be encouraged to participate in policy-making*
*(f) Public administration must be accountable*
*(g) Transparency must be fostered by providing the public with timely, accessible and accurate information*

*(h) Good human resource management and career development practices, to maximise human potential, must be cultivated. Public administration must be broadly representative of the South African people, with employment and personnel management practices based on ability, objectivity, fairness, and the need to redress the imbalances of the past to achieve broad representation.'*

There is some overlap between these principles and the criteria that the NHI has already outlined for the HTA body. In particular, the obligation to ensure efficient and effective use of resources aligns neatly with the overall objectives of an HTA body in evaluating the effectiveness and cost-effectiveness of interventions. However, the current process leaves little room for public participation in decision-making. This can be rectified by including public comments in the appraisal process or allowing community representatives to participate in decision-making.

An additional shortfall of the current NHI Bill is that there are no mechanisms for dissemination of determinations and reasons for decisions that could improve transparency. A number of HTA bodies, including those in Germany and Sweden, make the appraisal documentation or their determinations, with reasons, publicly available[5]. Following a similar process would improve compliance with legal obligations. However, these principles are not limited to the appraisal process, but could also be fulfilled post appraisal, before a decision is taken.

These requirements of good decision-making and efficient use of resources apply equally to both topic selection and implementation. It is possible to challenge the use of specific service providers or even why certain health technologies are being prioritised for consideration. As a consequence, the HTA body must not only ensure good administrative decision-making through the appraisal process, but also include features to ensure that proper processes are followed both when choosing what interventions to review and determining who will be tasked with implementing them.

***Procedurally robust decision-making***

Section 33 of the Constitution[13], coupled with PAJA, entitles everyone to lawful, reasonable and procedurally fair decision-making. This means that the HTA decision-making process will need to comply with PAJA, which imposes certain process requirements on any decision-making process, including procedural fairness and reasonable decision-making.

This carries with it a host of obligations for decision-makers to not only take lawful and fair decisions, but also to provide mechanisms for these decisions to be reviewed. This means that decision-makers in the context of HTA must ensure that their decisions are reasonable and within the bounds of what the law allows. In addition, where a person's right is affected, a decision-maker may be required to provide reasons for taking a particular decision. As discussed above, this will likely always be the case for decisions related to healthcare. In addition to the above, there must be mechanisms to review the decision internally - using either the National Department of Health or HTA body's infrastructure - and through the court system.

Most significantly, the requirements of fair administrative decisions require a level of standardisation in decision-making to ensure that the same sorts of criteria are applied consistently through evaluations. If an HTA body is the decision-maker, this is limited to ensuring that the correct criteria are assessed in a

consistent manner. However, if the HTA body makes recommendations that a decision-maker, such as the Minister of Health, may choose to follow, the process is more complicated, as the Minister may opt to go against the recommendations of the HTA body, provided he has valid reasons to do so.

## CONCLUSION

In conclusion, the introduction of the NHI Act in South Africa marks a significant step towards achieving universal healthcare in the country. The Act proposes the use of HTA to make decisions about the inclusion or exclusion of healthcare interventions in the NHI benefits package. However, as this article highlights, there is a need for legal considerations to be integrated into any HTA process adopted to ensure the robustness of decisions on what services are included or excluded from the NHI, and compliance with legal requirements.

The HTA process, as outlined in the NHI Act, lacks clarity on the specific criteria and processes that will be used to make critical decisions about what the NHI will cover. This poses a significant risk to any decisions made about what to cover, leaving the scheme's coverage susceptible to legal challenges. The present article underscores the importance of incorporating three crucial legal dimensions into the HTA decision-making process.

Firstly, constitutional rights, especially the right to health, must be considered to avoid decisions that may infringe on individuals' access to healthcare. Secondly, principles of good decision-making, including transparency, accountability and public participation, should be integral to the HTA process. Lastly, procedural fairness, as mandated by the Constitution and PAJA, is essential for lawful and reasonable decision-making to improve the rigour of decisions on what the NHI will cover.

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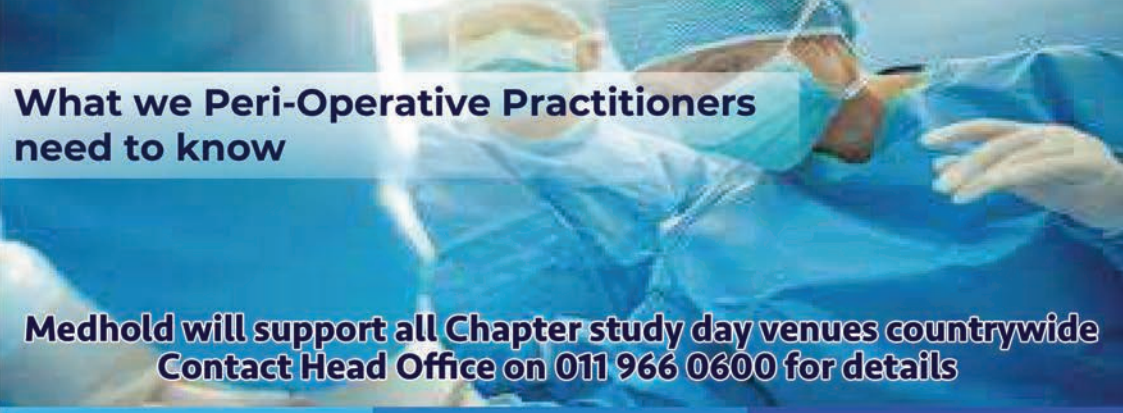

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