



Association for Peri-operative Practitioners in South Africa

# Journal



Vol 7 Issue 2 May 2021

Caring. Compassion. Commitment.

## 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.

## GENERAL INFORMATION

- The Journal is the official publication of APPSA (Association for Peri-operative Practitioners in South Africa). It provides personnel in the operating room and related services with original, practical information, based on scientific fact and principle
- 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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# From The PRESIDENT



Dear APPSA members. It is hard to believe that we already four months in 2021. Our country, and especially our healthcare workers, continue to manage the COVID-19 pandemic through the vaccination roll-out programme. A lot of changes have taken place in our workplace environment in order for us to keep ourselves and our patients safe. We are still strong, determined and dedicated. As the APPSA National Executive Committee, we would like to thank each and every one of you for your continued commitment and dedication to your profession, your colleagues and most importantly, to your patients. Congratulations on a job well done!

As we approach our winter session, and what could appear to unfortunately be the beginning of the Third Wave in South Africa if we look at the statistics over the last couple of days, it is vitally important that we all take the necessary precautions seriously and continue to protect yourself, your co-workers, your families and all your patients. COVID have proven to be a very serious, battle-hardy opponent. I would like to encourage everyone to take their COVID-19 vaccination AND their flu vaccination, wherever possible. The flu vaccine is the most effective way of preventing seasonal influenza. As peri-operative practitioners, the last thing we can afford is to compromise our own immune systems any further by contracting the seasonal flu we are faced with every year. Once again, research has proven that the flu vaccine helps prevent severe flu infections. This has become increasingly more evident with the COVID-19 vaccine as well. There are currently little more 318 000 people who have been vaccinated against COVID-19 as I write. Hopefully this number will have increased by the time you read this journal.

I understand that many people are terrified about having the COVID-19 vaccine - mainly because the disease is still so young, and there is still so much we need to know about the disease and the vaccine before people feel more at ease. As a result, there are a lot of people who will tell you about others who have developed a clot from the COVID-19 vaccine. But before you panic, let us look at the FACTS: with the AstraZeneca vaccine, the statistics show about four in 1-million people COULD develop a blood clot. With the Johnson & Johnson vaccine the figure is about eight in 7-million people. **The risk of NOT being vaccinated far outweighs the risk of having the vaccine.** Let us not forget that 165 000 people who contracted COVID-19 actually developed blood clots from the disease itself! This disease is severe and anything we can do - as humanity - to prevent people getting severe COVID-19 disease must be done, by all of us. So, please keep yourself and your families safe: Sanitise; Wash your hands; Social distance; Wear your mask over your mouth AND your nose. Make a difference by leading by example.

We are still hoping to have a Mini-Congress in Gauteng in September 2021, but more about that later if we are able to get the Green Light and put a cost-effective programme into place. Stay safe, and go well. Until we can see each other again.

**Marilyn de Meyer**



# From The EDITOR'S DESK

## HAPPY INTERNATIONAL NURSES DAY!

The theme for International Nurses Day 2021 is *Nurses: A Voice To Lead* with a subtheme of *A Vision For Future Healthcare*. How appropriate a theme that is, for it is the nursing fraternity (across all spheres of nursing) who care for us when we are at our most vulnerable, in the most pain, and when we need support the most. And innovation in medical care is most visible in an OR and in the treatment we receive post-operatively in the wards in hospitals, and in step-down facilities.

When I was researching International Nurses Day, I looked up what the theme was for last year's Nurses Day. The theme for International Nurses Day 2020 was '*Nursing The World To Health*'. How ironic. Next to the Bubonic plague, I don't know a time when the worldwide healthcare profession was faced with a greater, more impossible task than the one faced by global healthcare workers during 2020. No one could have anticipated the COVID-19 pandemic, or predict just how impossible it would be to nurse humanity during 2020. It nearly broke us. It did break many. I am not talking about the financial meltdown the world has endured. I am talking about the emotional, physical and spiritual toll COVID-19 has taken on the world, and the havoc it is wrecking today, across the globe, in May 2021.

This year's theme is very apt. The International Council of Nurses' Chief Executive Officer, Howard Catton, said: "The pandemic has exposed the weaknesses in our healthcare systems and the enormous pressures our nurses are working under, as well as shining a light on their incredible commitment and courage. What the pandemic has also done is given us the opportunity to call for a reset and the opportunity to explore new models of care where nurses are at the centre of our healthcare systems." I couldn't agree more. Not all Superheroes wear capes. Well, not anymore. In the early days of modern nursing, between 1915 and 1940, a nurse wore a cape as a standard part of her uniform. It was a badge of honour. Today these capes are invisible - but they shouldn't be. We ARE heroes. We ARE saviours - for all patients in our care. Those who suffered from COVID-19, are still suffering from COVID-19, and the ordinary patient whose lives are in are hands on a daily basis.

I don't have to elaborate just how many short-comings have been exposed in South Africa's healthcare system. The COVID-19 pandemic didn't create them, they were there long before the pandemic. COVID only highlighted them, brought them to the fore: ineffective and uncaring hospital management, insufficient equipment and staffing, inadequacies in budgets, and systemic corruption in procurement processes. We know it all. But we have a chance to make a difference - by being different in the way in which we treat our patients, and by the caring way we treat our patients and their families. If you have a chance to make a difference in a patient's life, to be a leading light, and to bring some hope to a dismal situation - BE THAT DIFFERENCE. Be that Voice That Leads.

**Madeleine Hicklin**

# HELPING NURSES COPE WITH COVID-19 PANDEMIC: Evaluating Support Programmes

By Dorothy C Nwanonyiri\*, Grace Ogiehor-Enoma, Emilia Iwu, Teresa Nwaneri

## ABSTRACT

During the height of the Coronavirus Disease (COVID-19) pandemic, nurses all over the world, including members of the National Association of Nigerian Nurses in North America (NANNNA) experienced a heightened and unprecedented level of stress, anxiety, fear, uncertainty, concern for their safety and that of their loved ones. This prompted NANNNA leadership to initiate and conduct support programs for nurses - especially those on the frontline of care. This project evaluates the effectiveness of the support programs conducted by NANNNA during the early surge of COVID-19. The Centers for Disease Control's (CDC's) Framework for Evaluation in Public Health guided this evaluation. Focus group discussion and on-line survey was utilized to gather data.

While 19% of respondents reported being diagnosed with COVID-19, the majority (81%) were not. About 44% of respondents had family members who were diagnosed with COVID-19, while 18% reported loss of a close family member due to COVID-19 complications. Most respondents reported that the program was impactful in information sharing, as well as significant in helping them feel connected with other nurses. Hence, this subsequently enhanced their support networks, provided emotional and spiritual support. Survey results revealed that NANNNA support programs had positive effects in helping members mitigate the fear, anxiety and uncertainty experienced during the surge of the COVID-19.

## BACKGROUND

During the height of the Coronavirus Disease (COVID-19) pandemic, nurses all over the world, including members of the National Association of Nigerian Nurses in North America (NANNNA) experienced unprecedented levels of stress, anxiety, fear, uncertainty, concern for their safety and that of their loved ones. Although stress is part of the nursing profession<sup>1</sup>, the COVID-19 pandemic created a heightened level of stress and one that needed immediate intervention. Current literature put forward that some frontline nurses reported having trouble sleeping in addition to fear for personal and family safety<sup>2-3</sup>. Globally, this prompted many nurses, inclusive of NANNNA members especially those on the frontline of care, to consider exiting the nursing profession. Many nurses cited working in high-risk environments without adequate personal protective equipment (PPE), working long hours, and lack of support from leadership or management of their institutions as reasons for making this consideration<sup>4</sup>.

A survey conducted by the Royal College of Nurses' revealed that 36% of nurses were considering leaving the profession due to stagnant pay, treatment of nursing staff and low staffing when compared to 27% in similar report the year prior. According to NBC News, 'some front-line nurses have decided to quit their jobs, citing inadequate protection against the novel coronavirus and fear for their safety, along with that of their families'. In a recent study, it was evident that there is high concern among nurses for personal and family health during infectious disease outbreaks such as COVID-19 and this was supported by previous studies in an epidemic<sup>5,6,7</sup>.

According to Slavitt<sup>8</sup>, the pandemic actually exposed the shortcomings of the US healthcare systems, such as lack of accumulation of sufficient PPE, poor infection control protocols, lack of ability to swiftly and easily share information, shortages in key jobs such as respiratory therapists, nurses and other health practitioners, shaky supply chain of important life-saving medications, inadequate protocol for end-of-life guidance for people dying alone from highly infectious diseases. This clearly underscored the fact that the healthcare system and nursing workforce were unprepared to deal with the unprecedented challenges imposed by such public health crisis. Particularly in New York city - the epicenter of the US epidemic where the highest rate of infection and deaths was reported - many NANNNA members in the New York City areas and surroundings began to reach out for help, advice and emotional support. This led NANNNA leadership to conduct a rapid assessment through membership survey. This need assessment revealed a need for more in-depth study and programs to support nurses and other healthcare professionals during current and future infectious disease outbreak. Hence, this support program was initiated to address some of those immediate needs.

Providing support for nurses during the surge of the Coronavirus (COVID-19) pandemic aimed at enhancing access to peer and social support as well as providing opportunities to share information that will be helpful in mitigating the stressors imposed by the pandemic. Research suggests that supporting nurses during high levels of occupational stress is essential to preserving their health in the short term and over time<sup>5</sup>. As stated by Dennis<sup>9</sup>, support groups offer many advantages in mitigating the psychosocial functioning and health-related quality of life issues imposed by the stressor(s). Additionally, studies have also shown that support groups create opportunities for participants to receive social support and disease-related information<sup>10</sup>.

After six months of running the support group that started with one program but expanded to four programs to address the needs of the nurses, NANNNA Research committee implemented a program evaluation to assess the impact.

The four programs under evaluation are:

- 1) Daily Support for Nurses in the frontline of COVID-19 Care
- 2) Individual Peer-Support by COVID-19 Survivors
- 3) Bereaved Family Support
- 4) Weekly Spiritual Support/Group Prayer

These programs formed a pathway to help nurses feel less stressed, less fearful and less anxious. Evaluating these support programs will help to gather data that will inform current and future support for nurses in similar situations.

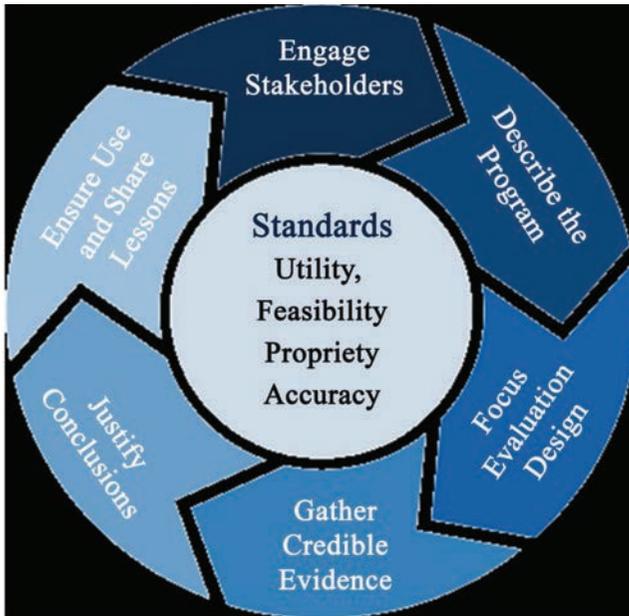
## EVALUATION DESIGN AND METHODS

The CDC's Framework for Evaluation in Public Health guided this evaluation (see Figure 1). The framework comprises of six interconnected steps which could be used to design an effective program evaluation. It summarises and organises the basic elements of a program evaluation and provides a common structure for conducting an evaluation.

The six steps are:

- 1) Engage stakeholders

- 2) Describe the program
- 3) Focus the evaluation design
- 4) Gather credible evidence
- 5) Justify conclusions
- 6) Ensure use and share lessons learned<sup>11</sup>.



**Figure 1.** CDC Framework for program evaluation in public health (<https://www.cdc.gov/eval/>).

Utilising this framework as a guide, the major stakeholders, NANNNA Board of Directors (BOD) were invited to participate in a Focus Group Discussion (FGD). The purpose of the FGD was to gather information about the genesis and objectives, plus to understand the phenomenon of interest for initiating the support group from the point of view of the BOD. Essentially, the data from the FGD provided the background for the program evaluation and focus for the evaluation design.

#### *Focus Group Discussion (FGD)*

The discussion began with formal introduction of the seven persons NANNNA BOD members and the moderators. This was followed by verbal expression of informed consent and review of conflict-of-interest declaration by each participant. The discussion was conducted virtually through Zoom<sup>®</sup> video conference platform for approximately one and half hours. Using open-ended questions, the moderators asked participants to share how the support programs originated, the objectives and expected outcomes.

#### *How It All Began*

There was a consensus that the support group was initially ran by the organisation's Executive Director (ED) and supported by other board members during the early stages of running the

groups. The ED reported that during the height of COVID-19, she received many calls at different times of the day and night from NANNNA members who were scared and overwhelmed. She shared that some expressed desire to quit their jobs. Those calls led her to believe that there was great anxiety and tension amongst the members. She believed that some level of supportive intervention would help to alleviate the nurses' anxiety. She added: "This was the genesis for the program because nurses were scared and wanted to quit nursing altogether, I thought to myself that I need to start a support group. At first, the thought was to run a support group for New York NANNNA members since they were seeing the largest cases in the country". But, she quickly realized the importance of expanding it to all NANNNA members as other states were seeing increasing cases of the COVID-19 as well. Knowing that the process will be very challenging and overwhelming to handle alone, she reached out to the board members to assist.

### *Implementing the Program*

The participants reported that they initially thought about creating a hotline for nurses to call in, but later decided to use the organisation's existing teleconference line. Information about the support programs were disseminated through the group's social media. Attendance was open to every nurse regardless of his or her membership to NANNNA. Initially the support group ran daily for two hours (from 18:00 to 20:00 Eastern US time).

The participants reported that more nurses called in the last hour than in the first hour. As a result, the timing was decreased to one hour daily from 19:00 to 20:00 Eastern US time. According to the participants, turnout was robust for the first three to four months but gradually decreased as availability of PPEs improved and nurses were becoming more knowledgeable about dealing with the challenges imposed by COVID-19 pandemic. This prompted a reassessment of the program and subsequent adjustment in the frequency and eventual reduction from daily to twice weekly on Tuesday and Thursday from 19:00 to 20:00 Eastern US time.

In terms of structure for the group sessions, one of the participants who is a global nurse expert shared: "We borrowed from experiences with running support groups for nurses caring for patients living with Human Immuno-deficiency Virus and Acquired Immuno-deficiency Syndrome (HIV and AIDS) in the early years. There were lots of similarities with what is happening now with nurses being afraid, this mirrored what we witnessed in HIV care." Using that structure, facilitators guided nurses to share their experiences in the frontline, helped them to identify their strength, discuss updates about COVID-19, dialogue about challenges and brainstorm about possible solutions, to name a few.

The main reason the support group was created for members of NANNNA was because these nurse leaders are knowledgeable about the cultural uniqueness of the group and were more sensitive to the groups' needs. As Nigerians, they also were comfortable navigating the cultural or religious nuances during the sessions. They also stated that the support group later diversified to enhance support for members who were infected with COVID-19 and others who were bereaved. As is unique with the Nigerian community, some of these nurses did not want to disclose these personal or family situations publicly during the group sessions. This led to the creation of more individualised support to ensure their needs were met.

On another note, the FGD revealed that the participants also benefited from the support program. One participant shared: "I was taking information gathered from the support group

to inform my current practice". Another participant (a retired public health practitioner) shared: "As a retired nurse, participating in the support group helped me to stay up-to-date with current and evidence-based practices instead of relying on what I hear on television." This participant further shared: "I didn't just learn from it, I used it to educate others in my inner circle and community." Another participant described how she utilised the information obtained from the support program to help develop capacity of an international organisation's COVID-19 taskforce. One participant was able to educate her church members using the coping strategies she learned from the support group.

### *Objectives of the Support Group*

As reported by the BOD, the main idea behind the initiation of the support was to give members the opportunities to share their experiences with a larger audience instead of just sharing it with the executive director alone. The other group objectives were:

- 1) Reduce the anxiety of nurses on the frontline
- 2) Preserve nurses' health and minimise the chances of infection
- 3) Educate nurses about available resources in their facilities
- 4) Teach members on how to develop plans to protect family members in the event of exposure
- 5) Teach members on how to provide support for their family when isolating at home
- 6) Promote mental wellness and resilience

### *Data Collection through Survey*

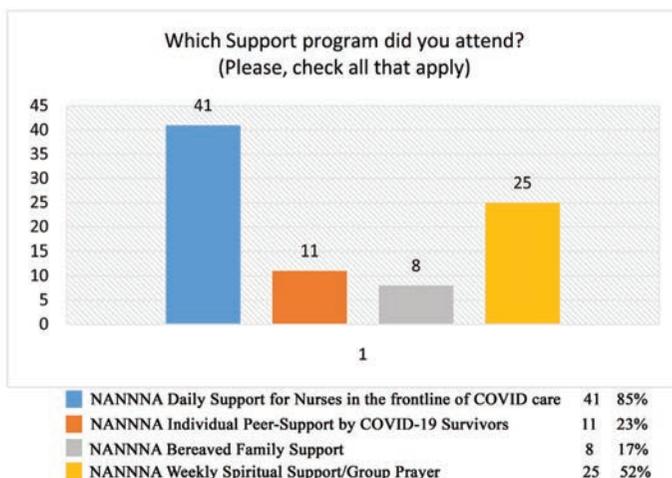
A questionnaire was developed by NANNNNA Research committee members to gather credible evidence to determine whether the objectives of the support programs were met. Using an on-line Survey Monkey platform, the questionnaire was distributed through the association's WhatsApp's groups, Emails and Website. The survey opened from 10 August to 31 August, 2020 and took approximately fifteen (15) minutes for completion. Participation was strictly voluntary and no identifying information was collected.

## **SURVEY FINDINGS**

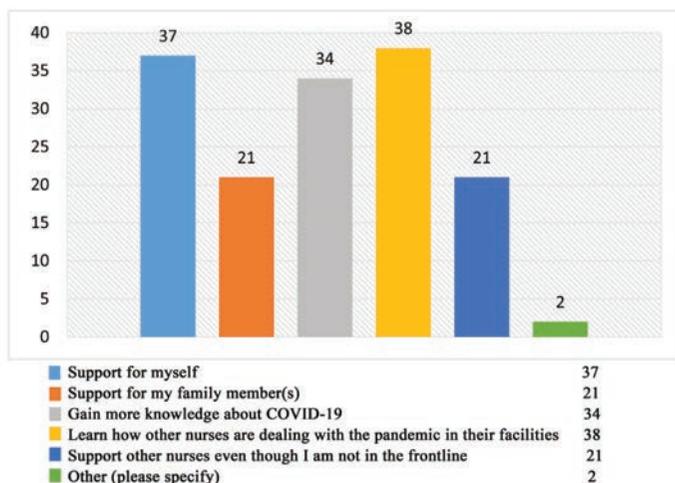
A total of 53 nurses responded to the survey, female (n = 50; 94%) and male (n = 3; 5%). Of those who responded, 94% were members of NANNNNA while 6% were non-NANNNNA members. In terms of which support programs nurses participated in, there were 48 respondents. Most nurses (n = 41; 85%) participated in the Daily Support Group for Nurses in the frontline of COVID-19 care; (n = 25; 52%) participated in the Weekly Spiritual Support/ Group Prayer; (n = 11; 23%) participated in the Individual Peer-Support by COVID-19 Survivors, while (n = 8; 17%) participated in the Bereaved Family Support (see Figure 2).

Responding to the reason(s) for participating in the support groups, most respondents; (76%) indicated that they wanted to learn how other nurses were dealing with the pandemic in their facilities. Next were seeking self-support (73%) and gaining more knowledge about COVID-19 (67%). About one third of respondents (41%) reported that providing support for family member(s) and offering support to other nurses were their reasons for participating in the support group (see Figure 3). Most respondents participated in the programs one to two times per week. While 19% of respondents reported personal diagnosis with the COVID-19, the majority (81%) were not infected. About 44% of the nurses reported having family members who became

infected with COVID-19 while 18% lost a loved one to complications of COVID-19. Overall, 86% of respondents reported that the program was very helpful in sharing beneficial information and best practices, while 67% reported feeling connected. About 71% of the nurses reported that the program helped them with emotional support and spiritual support was reported by 61% of nurses. As a result of participating in the support program(s), most of the respondents reported feeling supported by the organisation (64%). Some; 46% of nurses reported that they were able to recognise their limits when caring for COVID-19 positive patients, practiced self-reflection, self-compassion, and self-care. Others; 62% reported that they were able to share COVID-19 related feelings and experiences with colleagues and while 46% reported that they were able to spend quality time with their loved ones.



**Figure 2.** Types of support programs.



**Figure 3.** Reasons for participating in support programs.

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Respondents also shared that because they participated in the support programs, they gained knowledge about current treatment/management modalities for COVID-positive patients and became more assertive in requesting for adequate PPE. Survey respondents further shared that hearing from other COVID-19 survivors was helpful in their recovery. Some respondents indicated that they experienced spiritual healing, coped better with the anxiety of returning to work after COVID-19 exposure and as well as engaged in journalling. About 12% of respondents indicated that the support programs helped them to cope better with the grief of losing a loved one.

In response to a qualitative feedback for the program improvements, the participants proffered the following recommendations:

- 1) Decentralisation of the group by creating regional groups. This would enhance personal connection and support
- 2) Creating improved awareness about the program at the local levels to encourage participation
- 3) Encouraging participants to allow fair hearing from everybody without interruption
- 4) Inclusion of inter-professional colleagues
- 5) Developing a structured outline on how to run a support group as an output from the program

## **DISCUSSION OF FINDINGS**

The purpose of this project was to evaluate the effectiveness of support programs conducted by NANNNA for its members especially those on the frontline of care in the battle against COVID-19. Looking at the objectives as described by the stakeholders, the survey result indicates that the support programs had a beneficial effect on the participants. The support programs were also effective in reducing fear, anxiety by educating nurses through information sharing. The respondents indicated several reasons for participating in the programs which includes but not limited to learning from other nurses, supporting themselves and gaining more knowledge about COVID-19.

In terms of what the participants found most useful about NANNNA Support program, the survey result showed that the goal as stipulated by the stakeholders was met in areas of providing support and education. However, the support program survey findings were limited to the responses provided by members of NANNNA who participated in the survey. This may not be generalisable to other nurses. Therefore, it would be important to look at support programs involving a wider array of nurses in different groups. During the FGD, the interviewers may have unintentionally influenced how participants responded to questions asked.

## **CONCLUSIONS**

Like many other health professional organisations, the leadership of NANNNA implemented support programs to educate and address the psycho-social needs of its members at the onset of COVID-19 pandemic. The support program was a very timely and beneficial intervention for NANNNA members and nurses in general. Cultural awareness also played an important role in helping to tailor the support intervention to address the needs of Nigerian nurses who became infected but did not feel comfortable to openly share their experiences. Therefore, it was vital

that these nurses were given the opportunity to share information with nurses who had similar experiences. NANNNA modelled in real time, provision of a critical aspect of health equity. Members who were bereaved were identified and provided a social space and needed support as they mourned their loved ones.

Participation in the support program helped respondents cope better with the challenges imposed by COVID-19. Overall, NANNNA support programs had positive effects of helping members mitigate the fear, anxiety and uncertainty experienced during the surge of the COVID-19. Hopefully, these findings from this program evaluation identified areas to inform policies and programs that will support frontline workers and reform the availability of PPEs in future disease outbreaks. This project also supports the importance of utilizing support programs during times of stressful life events as an effective way of reducing affected individuals' fear, anxiety and help people develop better coping mechanisms.

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### Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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# THE COURAGE Of Compassion

By Kate Woodhead, RGN DMS

## INTRODUCTION

The Kings Fund were recently commissioned by the RCN Foundation to provide insights into the changes that are required in nurses' and midwives' workplaces and ways of working to enable them to flourish at work, and to provide appropriate support mechanisms so that they are able to provide high-quality care in a sustainable way. The report<sup>1</sup> makes for sad and difficult reading and should be read by every nurse and midwifery manager, as well as senior managers and clinical leaders. It is hoped that this report will be the catalyst for a raft of changes, the NHS would be a better employer for the attention and changes to the means of support it provides.

This article seeks to explore the key factors and report on the main elements of impact on the wellbeing of nurses and midwives, both before and after COVID-19. The scope of the report includes all grades of nurses and midwives, including students, healthcare assistants and associates. It spans all four home nations and all care settings - including social care, primary care, mental health and acute care. Data was included from a literature review and three focus groups, as well as a series of 47 semi-structured interviews. This is a comprehensive report ensuring that the review team heard from a wide range of practitioners from a diverse range of perspectives. It is aimed at all those who can influence the work lives of nurses and midwives, including organisational and national nursing and midwifery leaders, workforce and professional development personnel, operational managers, national bodies, ministers and governments.

There are many recommendations and changes suggested to enable organisations to tackle the underlying causes of stress, ill health and poor wellbeing- such as chronic excessive workload, bullying, inadequate supervision, discrimination and poor team work.

Nurses' and midwives' work should be fulfilling and life enhancing despite the challenging roles that they have. Research has clearly shown that positive staff well-being significantly improves care, quality and safety, patient safety, patient satisfaction, productivity, financial performance and the sustainability of health and care services<sup>2,3</sup>. Poor workplace environments have damaging effects on both the mental and physical health of nurses and midwives and on the quality and services they provide.

## MENTAL HEALTH AND WELLBEING

### *Staff shortages*

Even before the COVID-19 crisis there were 100 000 staff vacancies in NHS in England. This represents 1 in 11 of all posts. Nursing presents one of the greatest challenges with an estimated 43 590 vacancies as reported by the National Audit Office in March 2020<sup>4</sup>. In some specialist fields there are startling data showing a 35% reduction in health visitors with one report citing that each health visitor has a caseload of up to 750 children and their families. There has been a 38% decrease in the number of nurses working in learning disability in the NHS in England.

Additionally, there is a considerable gap between capacity and demand in district nursing services. This amounts to unmanageable caseloads and some leaving the service as a result. There were reports of staff being 'broken', 'exhausted' and 'on their knees'<sup>5</sup>. Vacancies are also running high in adult social care with a registered nurse vacancy rate of around 6.6%. Many in this sector work on zero hours contracts which are known to be associated with a higher turnover rate. Staff turnover is high across nursing and midwifery. Previous research has clearly shown how workplace factors such as long working hours, poor quality working environments and lack of supportive leadership influence nurses to leave the profession<sup>6</sup>.

More than a third of nurses working in England are considering leaving according to a Royal College of Nursing survey in May 2020<sup>7</sup>. Some 44% of respondents indicated that the way nursing staff had been treated during the pandemic made them consider leaving the profession. This was higher among minority ethnic group staff (54%) than among white staff (42%).

## STRESS LEVELS

Health and care staff repeatedly report higher rates of work-related stress, depression and anxiety than those in most other sectors. Staff survey results also indicate that between 35% and 45% report being unwell due to work stress during the previous year. Such stress is likely to be chronic, as measures of work stress repeated over time among health and care staff are highly consistent as identified by West and Coia.

Sickness absence (3.4% ) in the NHS in England is reported to be twice the rate in the private sector (1.7%). Staff stress, absenteeism, presenteeism (attending work despite being unwell), turnover and intentions to quit had reached alarmingly high levels in the NHS in late 2019. And then the pandemic struck.

### *Causes of workplace stress*

The report explores seven key stressors which are:

- 1) Work pressure
- 2) Moral distress
- 3) Pay
- 4) Education and entry into nursing and midwifery
- 5) Work schedules
- 6) Discrimination
- 7) Bullying, harassment and abuse

The Nursing and Midwifery Council surveyed 1 626 of the 15 600 nurses who left their register across the UK between November 2018 and June 2019<sup>8</sup>. The top three reasons for leaving were retirement (52.7%), too much pressure resulting in stress and poor mental health (26.4%), and a change in personal circumstances (24.5%). Other reasons included disillusionment with the quality of care provided to patients (16%), staffing levels (15%) and concerns about workload (12%). Moral distress is described as incidents when staff feel they are in situations where they are unable to provide the quality of care they feel they should be able to because of excessive workload or a lack of resources. This was reportedly far higher during the pandemic where there have been shortages of beds, the need to discharge patients quickly to create capacity ,and a shortage of some services for critically-ill patients.

Many staff are intensely dissatisfied with their pay, with 61% of those who responded to an RCN survey (UK-wide) considering their pay/grade to be inappropriate. Nurses across all pay scales report financial challenges, with more than half (56%) of the 7 720 nurses responding to the 2019 RCN survey saying they had to cut back on food and travel costs; 23% had taken an additional job, 21% struggled to pay their gas and electricity bills, and 11% had been late with mortgage and rent payments. Nursing is a gendered profession and yet research published last year showed that men are still advantaged in terms of pay and opportunities for promotion and development across some pay grades in the UK<sup>9</sup>.

Entry into the profession, once qualified, is a highly stressful time for new nurses and midwives who report feeling apprehensive and unprepared. They tend to feel they have little autonomy, but face high work demands. I believe it is astonishing that the very people who could take away some of the stress of staff shortages, are treated poorly when taking their first jobs.

Working hours and excessive workloads affect patient safety, productivity, efficiency and the well being of staff. Shifts of more than eight hours carry an increased risk of accidents that accumulate. Many nurses prefer to work twelve-hour shifts so that they can work extra on their days off to top up their wages. Nurses from ethnic minority backgrounds are much more likely to work seven or more additional hours per week, and to take on extra paid work as they are less likely to be able to increase their salaries via promotion. Discrimination evidence from the NHS staff survey (2019), is stark from patients, their relatives or carers (18.3% of BME staff) and 4.6% of white staff and from managers/team leaders or colleagues 14.4% among BME staff and 6.4% among white staff. The proportion of cases of discrimination experienced by BME staff that were based on ethnicity has also risen over the last five years from 77.8% to 82%.

In addition, bullying, harassment and abuse has risen with more than 20% of staff having experienced some form of bullying, harassment or abuse in the last year. The major perpetrators are colleagues and more senior nurses and midwives. New staff are most likely to report bullying. Factors which contribute to bullying include hierarchical management cultures, and nurses and midwives not feeling empowered<sup>10</sup>.

Anyone who has worked in nursing or midwifery will be familiar with all the reported factors that contribute to stress and expressing an intention to leave, and they have been written about and felt for many generations of workers - to a greater or lesser degree. The context of COVID-19, however, and the extremes of workplace stress and burnout, are new elements and are obviously massive and critical to the collective view of the staff who experienced it. The consequences are mental and physical illness in those who suffer the aftermath of the situations listed above.

The report details three different core work needs which must be met in order to displace the negative effects and ensure we can turn things around to create an environment that can lead to staff thriving and flourishing at work. These are:

**Autonomy** - the need to have control over our work lives, and to be able to act consistently with our work and life values

**Belonging** - the need to be connected to, cared for and caring of others around us in the workplace, and to feel valued, respected and supported

**Contribution** - the need to experience effectiveness in what we do and deliver valued outcomes, such as high quality care.

Each of the three aspects of desirable workplace factors (ABC) have an enormous impact on the workplace engagement of nurses and midwives.

## CONCLUSION

I have worked in many roles in numerous hospitals where the good culture of support and empowerment have enabled a great feeling of motivation for the job, an eagerness to develop professionally, and a desire to make changes to ensure that patient care was the best it could possibly be. However, I have also worked in environments where the pervasive elements of bullying and harassment were a constant feature with poor workplace allocations, denial of rota requests and holidays and many other instances fuel already difficult situations.

Did I want to go to work everyday? Did I want to stay later than I was scheduled to leave work? Did I want to put huge effort into making patient care better in that hospital? Regrettably and shamefully not. I wanted to leave as soon as possible. After just a single week in that horrible workplace culture, I knew I had made a mistake in taking the job. I started to look for a different role immediately. I reported the issues at my exit interview, but I doubt that anything was ever tackled, it was deep seated and I suspect the staff in that facility still bear the brunt of it every single day.

Let us not enable the bullies to thrive, and let us make a conscious effect to address the context of excessive stress and workloads. These cannot continue if we want to maintain good healthcare practices. We need our staff - of all grades - to be happy and safe in their work in order to provide the best quality of care. This job is hard enough without our having unnecessary stresses added to the day.

*This article first appeared in the Clinical Services Journal in November 2020. It appears here, courtesy of the author. Kate Woodhead qualified in 1978. She has worked in peri-operative care since then and runs her own business as an Operating Theatre Consultant. Kate was Chairman of NATN from 1998 to 2001. She is the former President of the IFPN (2002 to 2006) and now works as an Advisor to WHO on the Safe Surgery Saves Lives Campaign. She is the Chairman of Trustees at Friends of African Nursing. For more information on FoAN please go to [www.foan.org.uk](http://www.foan.org.uk)*

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# PROMOTING PERSONAL ACCOMPLISHMENT To Decrease Nurse Burnout

By Kelli D Whittington, Thomas Shaw, Richard C McKinnies, Sandra K Collins

## INTRODUCTION

This article seeks to examine the impact of personal accomplishment on burnout as experienced by registered nurses. This examination includes assessing the relationships between the factors of work-life and burnout, specifically the relationships apparent during a healthcare crisis, such as the pandemic of COVID-19.

Cultures of employee wellness became a focus of attention when the Institute for Healthcare Improvement evolved from the Triple Aim to the Quadruple Aim<sup>1</sup>. This shift elevated the need for healthcare systems to consider the health and wellness of their employees, specifically examining potential areas for positive growth<sup>2</sup>. Both the National Academy of Medicine (NAM) and the American Nurses Association (ANA) fostered the promotion of healthcare employee health and wellness<sup>3</sup>. In order to promote an environment where patient care is paramount, it is essential to develop and hone the workplace environment into a supportive atmosphere<sup>4</sup>. Employee burnout can be devastating to the development of a healthy workplace environment, as well as extending impact to subpar patient care and outcomes; therefore exploring venues to decrease burnout is pertinent.

Burnout is defined by Maslach and Leiter as a collection of three different feelings; emotional exhaustion, depersonalisation, and low personal accomplishment<sup>5</sup>. As developers of the Maslach Burnout Inventory, Maslach, Jackson, Leiter, Schaufeli, and Schwab noted how burnout exists in a dynamic state, potentially fluctuating from low to moderate, and even high levels of the perceived feeling<sup>6</sup>. Since burnout fluctuates, it is crucial that healthcare providers consider ways to minimise the impact of these feelings as well as working within a healthcare delivery system that values interventions aimed at recognition and prevention of these feelings. Proactively developing a culture that seeks to prevent burnout positively impacts both absenteeism and abandonment of the healthcare profession<sup>7</sup>.

Burnout can be experienced as a work-place phenomenon negatively impacting the health of the healthcare provider and subsequent delivery of care. Within physician circles, burnout has reached staggering numbers, noted to be experienced by 50% of physicians<sup>8</sup>. Minimising this impact is crucial to the delivery of effective patient care, not to mention the health and wellness of the healthcare provider. When burnout is not addressed and minimised, the impact is felt not only from the healthcare provider, but also the patients receiving care from these individuals<sup>9</sup>. This subpar delivery of care results in decreased patient satisfaction, which in turn impacts the fiscal health of the institution<sup>10</sup>. As noted by the Centers for Medicare and Medicaid Services, Hospital Consumer Assessment of Healthcare Providers and Systems Survey (HCACPS) hospitals must submit the HCACPS data to receive full funding from the Inpatient Prospective Payment System (IPPS); essentially, lower patient satisfaction scores yields a lower Medicare reimbursement<sup>11, 12</sup>.

Identifying ways to enhance personal accomplishment (PA) is one way to minimise burnout. As nurses functioning as healthcare professionals delivering care to individuals, families, communities, and populations, it is of interest to examine the relationship of PA towards the impact of burnout. Personal accomplishment (PA) is defined as the feeling of accomplishment an individual feels when, in this research opportunity, working with people/patients<sup>13</sup>. Because working with patients can be both rewarding and exhausting, it is necessary to examine this relationship through the lens of what can be done to facilitate the experience of personal accomplishment, as a personal responsibility as well as organisationally.

To engage individuals in personal achievement responsibility, cognitive-behavioural techniques can be utilised to identify instances of achievement and maximise their impact<sup>14</sup>. As noted by Yeun and Kim, supervisor support is crucial to minimise the impact of emotional exhaustion by promoting a sense of PA; in fact, this support is so important it poses immediate benefits towards increasing nurse retention<sup>15</sup>. Lessons learned from Yeun and Kim provide a format for supervisor development that exceeds the traditional fiscal responsibilities, change agent, and management responsibilities. Simply stated, the more frequent an individual realises a sense of PA, the more it serves to minimise the experience of burnout. Therefore, fostering individual responsibility and organisational culture towards recognising PA yields positive results for the patient, employee, and organisation<sup>14</sup>.

## METHODS

### *Study design*

A quantitative methodology approach was utilised to examine the impact of PA on burnout among registered nurses in the United States. Specifically, the Maslach Burnout Inventory for Medical Personnel (MBI-HSS) and the Areas of Worklife Survey (AWS) were distributed via solicited email. Burnout was defined by *Maslach et al.* by assessing feelings of PA, emotional exhaustion, and depersonalisation<sup>6</sup>. The AWS explores workload, control, reward, community, fairness, and values as domains within the parameter of work life<sup>16</sup>. Utilising emails obtained from a national data distribution firm allowed the participants to access the survey via SurveyMonkey hyperlink. Utilising the data from registered nurses across the United States was preferred to limiting the sample to a specific geographical area with a smaller sample size.

### *Sample and setting*

During the Spring of 2020, emails soliciting study participation were sent to over 10 000 participants, with 11 responses being deleted due to incomplete survey data, and 93 responses complete and available for analysis. The survey participants were registered nurses, with retired nurses and nurses that no longer practice also completing the survey.

### *Data collection*

The institution's Human Subjects Committee approved the study prior to the mass email dispersal. Within the email, the participants received a cover letter of introduction with a statement indicating that participation was voluntary and consent was inferred by submission. Utilisation of a password protected SurveyMonkey account allowed all responses to be anonymous. Once the anonymous data was received, it was confidentially distributed among all four researchers. Participants were identified via identification numbers, with no personal identification being obtained.

### Data analysis

Per Human Subject Committee approval, all data was retrieved from SurveyMonkey and entered into a Microsoft Excel spreadsheet. SPSS-Version 26 was utilised to obtain descriptive and inferential analysis results. Descriptive data was completed by one researcher, which developed the foundational view of the results. Correlational studies were completed by a second researcher, while manipulating several of the variables to identify correlation. Once appropriateness was determined, a third researcher utilised linear regression to explore the independent variable of the six areas of work-life upon the dependent variable of PA. All statistical analysis was verified by the fourth researcher.

### Findings

Of the 93 participants in the study, 89% reported themselves as females, with age ranges in 10 year increments from 25 through 65, with an additional range indicating 65+; of the respondents, 50.63 years was the average age. 62.4% were employed in the nursing profession for 16 years or greater. For employment status, 15.1% of the respondents reported part time status, 74.2% reported full time status, and 10.8% reported they had retired or left the nursing profession.

Respondents reported employment position with 72% considering themselves as front line staff, 3.2% reporting themselves as supervisors, and 13% in either first level, intermediate or senior level management roles. Regarding organisation stability, 40.9% reported being at their current organisation for 5 years or less, 13.5% for six to 10 years, 16.1% for 11 to 15 years, 11.2% for 16 to 20 years, and 10.1% for 21+ years; 5.6% reported they had retired or left the nursing profession<sup>1</sup> (Refer to Table 1).

Variables	n	%
Reported Gender		
Female	83	89.2
Male	8	8.6
Prefer not to answer	2	8.6
Age ranges		
25-34	7	7.9
35-44	27	30.3
45-54	17	19.1
55-64	27	30.3
65+	11	12.4
Levels of Education		
Certified Nurse Assistants	2	1.1
Licensed Professional Nurse	2	1.1
Registered Nurse	72	77.4
Nurse Practitioner	12	12.9
Nurse Anesthetist	3	3.2
Employed in nursing profession		
1-5 years	10	10.8
6-10 years	10	10.8
11-15 years	15	16.1
16-20 years	13	14
21 years +	45	48.4

Variables	n	%
Employment status		
Full time	69	74.2
Part time	14	15.1
Retired or left nursing profession	10	10.8
Position within current organization		
Front line staff	67	72
Supervisor	3	3.2
Management (first level)	2	2.2
Management (intermediate level)	6	6.5
Management (senior level)	4	4.3
Time at current organization		
0-5 years	38	40.9
6-10 years	12	13.5
11-15 years	15	16.1
16-20 years	10	11.2
21+ years	9	10.1
Retired or left nursing profession	5	5.6

**Table 1:** Participant Demographics (n=93)

## PERSONAL ACCOMPLISHMENT

Although burnout has three distinct feelings associated with it, for purposes of this research, the feeling of Personal Accomplishment (PA) was examined. Respondents reported experiencing feelings associated with PA once to several times a week. The minimum frequency of 2.00 indicated feelings of PA once a month or less, while the maximum frequency of 6.00 indicated those feelings every day. The average PA score was a 37.78, with a minimum of 16 and a maximum of 48. Per the MBI inventory, the lower the score, the greater the correlation to burnout<sup>6</sup>. (Refer to Table 2).

Variable	<i>n</i>	%
Frequency of experiencing PA		
Never	0	0
Once a month or less	18	19.35
Once a week	34	36.56
A few times a week	37	38.78
Every day	4	4.30
PA total score		
27 or higher	87	93.54

**Table 2:** Participant scores on Personal Accomplishment subset of MBI

	Control	Community	Fairness	Values
Personal Accomplishment Pearson Correlation	.407**	.380**	.327**	.318**
Sig	.000	.000	.001	.002
N	93	93	93	93

\*\*Correlation is significant at the 0.01 level (2-tailed).

**Table 3:** Correlation of Control, Community, Fairness, and Values with Personal Accomplishment (PA)

inventory, the lower the score, the greater the correlation to burnout [6] (Table 2).

## AREAS OF WORK LIFE

Consisting of six subsets, workload (five questions), control (four questions), reward (four questions), community (five questions), fairness (six questions) and values (four questions), the Areas of Work life Scale (AWS) can indicate congruence between an individual and their associated work role<sup>6</sup>. Although the AWS does not offer one singular score associated with a positive or negative indicator of burnout, the six subsets can be examined together, allowing the researcher to extrapolate findings based on the results from each of the subsets<sup>1</sup>.

A robust picture of the sample responses was determined after completion of descriptive statistics. Additionally, relationships were examined using correlational studies. In addition,

linear regression was explored. There was no significance noted between demographic variables and PA. Within the sections of the AWS, control, community, fairness and values were noted to be statistically significant with PA. When examining the relationship between PA and Emotional Exhaustion (EE), a negative correlation is noted, indicating that an increase in PA is associated with a decrease in Emotional Exhaustion (Refer to Table 3).

Using PA as the dependent variable, linear regression provided additional statistical analysis when assessing the six subsets within AWS as independent variables. This analysis was appropriate as all assumptions were met, but no statistical significance was identified to indicate the AWS subsets work to predict the relationship with PA.

## **DISCUSSION AND RECOMMENDATIONS**

Upon reviewing the data results, the information clearly describes the relationship that exists between PA and the EE. As decreased feelings of PA are noted, feelings of EE, and thus burnout are noted. Conversely, when the individual notes an increase in feelings associated with PA, feelings of burnout as noted by EE is decreased. When examining these areas related to the AWS, indicators such as control, community, fairness, and values are noted to be statistically significant to feelings of PA. With these relationships in mind, it is paramount that individuals take ownership of their PA. This can be fostered and expanded through organisation guidance, specifically which is obtained through the relationship between the employee and supervisor. Fostering this acknowledgement in accomplishments positively impacts the employee, which in turn yields positive results with patient satisfaction and patient outcomes. Promoting individual responsibility of awareness of PA can develop a culture that minimises and stunts the development of burnout.

Developing ways to recognise PA can start with an appreciation of care rendered, as well as acknowledging instances where the individual effectively deals with stressors in the workplace. Assisting nurses to problem solve effectively while recognising their ability to positively impact their patients' experience allows for identification of accomplishments. Based on the questions in this subset, it is imperative that nurses can identify their positive influence on others, their ability to handle daily tasks and problems, as well as instances where they feel physically empowered by their decisions<sup>6</sup>.

In addition to fostering individual responsibility of recognising PA, developing the ability of supervisors/managers to develop relationships where acknowledgement of performance is foundational is crucial. By emphasising the instances where their nurses have performed consistently well, supervisors can serve as that positive reinforcement towards mindfulness.

## **CONCLUSIONS**

As noted by developers of the MBI inventory, individuals have a personal responsibility to utilise stress management techniques in an effort to minimise burnout. Such techniques include cognitive behavioural exercises, including mindfulness<sup>14, 6</sup>. Additionally, when combined with concerted efforts from administration, supervisors are uniquely positioned to enhance interventions effective in minimising facets of burnout<sup>6, 15</sup>. Understanding the nature of burnout as well as techniques proven effective for enhancing the nurse's sense of health and wellness is

worth the effort when examining the positive impact of employee health on employee retention and patient satisfaction and outcomes.

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# EVALUATION OF THE USE OF SPINAL ANAESTHESIA ADMINISTERED Prior To Proceeding To The Operating Room In Patients Undergoing Total Joint Arthroplasty

By Matthew L Ritz; David M Rosenfeld; Mark Spangehl; Lopa Misra;  
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## ABSTRACT

**Background:** Previous studies have demonstrated improvements in efficiency when specific procedures are performed in a designated pre-operative area prior to proceeding to the operating room (OR). In this study the authors sought to evaluate if spinal anaesthesia could be safely and efficiently administered prior to proceeding to the OR when compared to general anaesthesia and spinal anaesthesia administered in the OR.

**Methods:** The authors reviewed the electronic health record at a single institution between the years 2012 to 2018. Total joint arthroplasties by a single surgeon were identified and the specific time frames of interest were measured and compared between patients who received a spinal anaesthetic in the pre-operative area, patients who received a general anaesthetic, and patients who received a spinal anaesthetic in the OR. These time frames of interest included: anaesthesia induction time, OR recovery time, post-anaesthesia recovery unit time, and OR turnover time. The electronic medical record was also reviewed for spinal-related adverse events. Categorical variables were compared using the Fisher exact test and continuous variables were compared using equal-variance t-test and one-way ANOVA.

**Results:** The study cohort consisted of 246 patients (142 total hip arthroplasty and 104 total knee arthroplasty); 40.2% (99) of patients received a general anaesthetic (GA), 52% (128) of patients received a pre-operative spinal anaesthetic (PSA), and 7.7% (19) of patients received an intra-operative spinal anaesthetic (ISA). PSAs demonstrated a shorter anaesthesia induction time, shorter OR recovery times, shorter PACU recovery times, and longer OR turnover times when compared to GA and ISAs. There were no spinal-related adverse events.

**Conclusion:** The results of this retrospective cohort study demonstrate that administration of spinal anaesthesia in the pre-operative area is safe as compared with intra-operative spinal administration. Pre-operative spinal for total joint arthroplasty reduces time spent in the OR and PACU when compared with general anaesthesia and intra-operative spinal but it does not substantially affect overall peri-operative efficiency.

## INTRODUCTION

Total knee arthroplasties (TKA) and total hip arthroplasties (THA) are frequently performed elective orthopaedic operations, with over 1-million total joint replacements (TJR) being performed annually in the United States<sup>1</sup>. TJA is commonly performed under general or neuraxial (spinal or epidural) anaesthesia. In a multi-center retrospective study, Memisoudis *et al.* demonstrated that patients receiving GA versus neuraxial anaesthesia for TJA were more likely to require utilisation of critical care resources<sup>2</sup>. Patients receiving spinal anaesthesia versus GA in TJA have also been shown to require fewer blood products, have decreased incidence of post-operative nausea and vomiting (PONV), and experience improved pain control post-operatively<sup>3,4</sup>.

In addition, patients that receive spinal anaesthesia have been shown to have shorter times spent in the recovery area, shorter hospital length of stay, and lower hospital costs<sup>4, 5, 6, 7</sup>. Despite the advantages, performance of spinal anaesthesia carries its own risks including haemodynamic instability and respiratory depression and, in addition, requires procedural expertise, time and resources from the anaesthesia and peri-operative teams. Prior to 2017, most TJA at our institution were performed under GA, in part because of concerns that placement of spinal anaesthesia in the OR was associated with delay of surgical starts and overall inefficiency. In 2017, the Departments of Anaesthesiology and Orthopaedic Surgery at our institution collaborated on the design and implementation of a protocol to administer spinal anaesthesia pre-operatively in the patient holding area with immediate transport to surgery for patients undergoing TJA. The purpose of this study was to determine:

1. If spinal anaesthesia can be safely performed in the pre-operative holding area
2. If there are peri-operative time savings of pre-operative spinal anaesthesia (PSA) compared with GA or intra-operative spinal anaesthesia (ISA).

## MATERIALS AND METHODS

### *Study Design*

This is a retrospective records review after implementation of a quality improvement process change. Our methodology was in compliance with the EQUATOR STROBE guidelines. After receiving approval from the Mayo Clinic Institutional Review Board (ID 18-007811) we used our electronic health record (EHR) to access surgical records from between 2012 to 2018 to obtain time frames of interest. Data acquired was retrospective and de-identified, thus informed consent was not required as advised by the Mayo Clinic IRB. Study size was determined by the number of cases done during the pre-determined time frame and was not determined by a pre-study power analysis.

### *Study Cohort*

The EHR was reviewed of all patients who underwent primary TKA or THA at Mayo Clinic Arizona by a single surgeon between May 2017 and May 2018. In addition to acquiring basic demographic data, American Society of Anaesthesiologists (ASA) class, anaesthesia type (GA vs spinal), the following times were calculated for each case: 1. *Induction Time*, defined as the time from the patient entering the OR to the surgical incision time; 2. *OR Recovery Time*, defined as the time from skin closure to the patient leaving the OR 3. *Post anaesthesia recovery unit (PACU) Time*, defined as the time from patient arrival in the PACU to the time at which the patient met institutionally standardised discharge criteria, 4. *Turnover Time*, defined as the time from which one patient leaves the OR until the time at which the next patient enters the OR (**See Figure 1**). Pre-operative spinal procedural times were also collected from spinal procedure notes.

The EHR was also reviewed for evidence of spinal-related adverse events, defined as development of high spinal, cardiac arrest or significant haemodynamic instability requiring vasopressors, and/or significant respiratory distress requiring airway interventions other than supplemental oxygen. Discharge criteria from the PACU included: a patent airway, vital signs consistent with pre-procedural baselines, appropriate pain control, control of any PONV, and in the case of a spinal anaesthetic, return of sensory and motor function below the umbilicus. In a separate analysis we also reviewed TJR data from the same surgeon between 2012 and 2016. During that time frame, institutional practice was for the spinal to be performed in the OR (ISA) immediately

prior to surgery. We used this additional data to compare the Induction Times, OR Recovery Times and PACU times for ISA with those the GA and PSA cohorts. Turnover times for this cohort were not available due to a change of EMR in 2017.

### Anaesthetic Protocol

Standard practice for the GA group during the study period consisted of standard ASA monitors, general endotracheal anaesthesia with volatile anaesthetics and muscle relaxation. Pain management was accomplished primarily with intravenous acetaminophen, hydromorphone, and/or fentanyl as well as a periarticular injection of ropivacaine, epinephrine, morphine and ketorolac performed by the surgeon. This same periarticular block was also administered to all patients undergoing TJA under spinal anaesthesia. Our hospital utilises an anaesthesia care team model composed of an anaesthesia resident or CRNA in the OR with a supervising anaesthesiologist. For the pre-operative spinal anaesthesia cohort (PSA) our group developed a standardised pre-operative checklist (See Figure II). A spinal cart was taken to the patient's

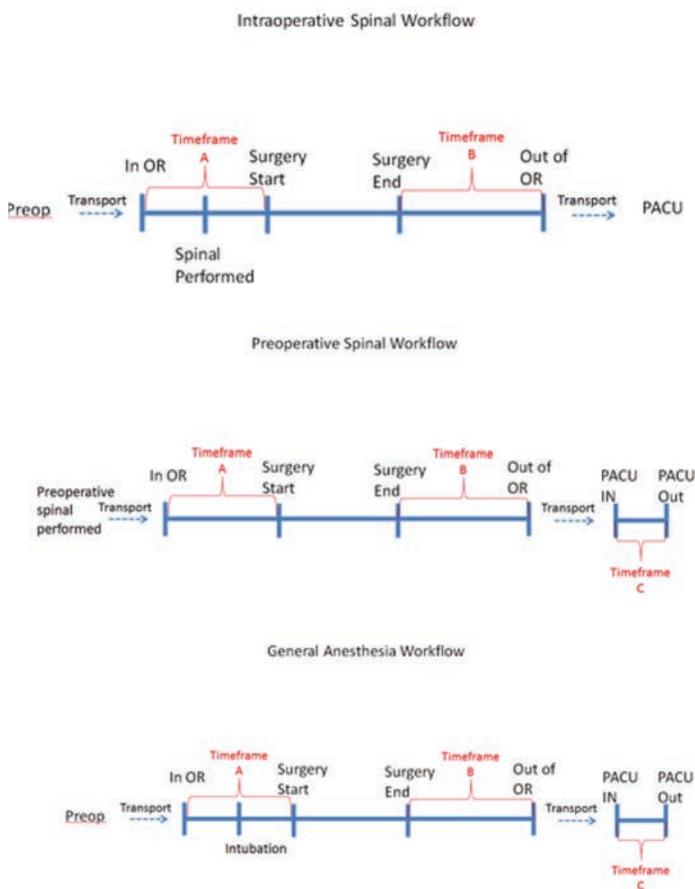


Fig. 1. Anesthetic workflows with timeframes of interest.

### Spinal checklist

1. Standard procedure pause
2. Adequate personnel present
3. Patient fully monitored (BP, EKG, O2Sat) with portable monitor
4. Airway equipment ready
  - a. O2 on patient
  - b. Ambu-bag present
  - c. Oral airways, LMAs, laryngoscopes, ETTs
5. Emergency and anesthesia drug box in room
6. Ephedrine and Phenylephrine syringes at bedside
7. Spinal bupivacaine and epinephrine ready

Fig. 2. Preoperative Spinal Checklist.

pre-operative room which had equipment for the procedure along with emergency airway equipment. Standard ASA monitors were attached to all patients and vitals were recorded continuously. Hyperbaric bupivacaine 12mg to 15mg with epinephrine wash but without opiate was administered via a lumbar puncture and procedural sedation was accomplished with midazolam and/or fentanyl. Following administration of the spinal anaesthetic by the anaesthesiologist (attending or resident), the CRNA or the resident immediately transported the patient to the OR with portable monitoring. After positioning on the OR table, moderate sedation with propofol was administered. ISA was performed in a similar manner except that the entire procedure was performed in the OR.

### Statistical Analyses

Categorical data are summarised as count and percentage while continuous variables are summarised by mean and standard deviation. Categorical variables, such as ASA, are compared between two groups using the Fisher exact test while continuous variables, such as OR recovery time, are compared between groups using the equal-variance t-test and one-way ANOVA for two-group and three or more group comparisons, respectively. Transition time was calculated as the period from out-OR from one procedure to in-OR for the subsequent procedure where procedures were performed consecutively and on the same calendar date. All hypothesis tests were two-sided with  $p < 0.05$  considered statistically significant. Analyses were performed using SAS v9.4 (SAS Institute; Cary, NC).

## RESULTS

Demographic data is presented in **Table 1**. The study cohort consisted of 246 patients (142 THA and 104 TKR); 40.2% (99) of patients received a GA, 52% (128) of patients received a PSA, and 7.7% (19) of patients received an (ISA). GA patients had a higher burden of co-morbid disease evidenced by the higher percentage of ASA 3 patients. Average Induction, OR Recovery and PACU Recovery times and Spinal Procedural Time are presented in **Table 2 and Fig. 3**.

*Average Induction Times* were as follows: GA 32.3 minutes (SD 4.8), PSA cohort 28.6 minutes (SD 4.3), and ISA 39.7 minutes (SD 6.0) ( $p < 0.0001$ ).

*Average OR Recovery Times* were as follows: GA 12 minutes (SD 4.6), PSA 7.9 minutes (SD 2.6), ISA cohort 8.9 minutes (SD 1.7) ( $p < 0.0001$ ).

*Average PACU Recovery Times* were as follows: GA cohort was 78.2 minutes (SD 35.4), PSA 66.6 minutes (SD 17.1), ISA 72.6 minutes ( $p = 0.001$ ) (**Table 1**) (**Fig. 3**).

**Table 1**  
Demographic and Procedural Characteristics.

	GA (N=99)	ISA (N=19)	PSA (N=128)	Total (N=246)	P Value
<b>Average Age (SD)</b>	67.4 (11.2)	73.1 (10)	66.0 (10)	67.1(10.6)	0.0214 [1]
<b>ASA Status</b>					0.0696
ASA1 (%)	5 (5.1%)	0	2 (1.6%)	7 (2.8%)	
ASA2 (%)	56 (56.6%)	11 (57.9%)	94 (73.4%)	161 (65.4%)	
ASA3 (%)	37 (37.4%)	8 (42.1%)	32 (25%)	77 (31.3%)	
ASA4 (%)	1 (1%)	0	0	1 (0.4%)	
<b>Surgery Type</b>					0.4375
THA (%)	62 (62.6%)	10 (52.6%)	70 (54.7%)	142 (57.7%)	
TKA (%)	37 (37.4%)	9 (47.4%)	58 (45.3%)	104 (42.3%)	

1Age difference between ISA and PSA statistically significant. No significant difference found between GA and either spinal group.

**Table 2**  
Perioperative Time Comparisons.

	GA (N=99)	ISA (N=19)	PSA (N=128)	Total (N=246)	P Value
<b>Times in Minutes (SD)</b>					
Induction Time	32.3 (4.8)	39.7 (6)	28.6 (4.3)	31 (5.5)	<0.0001 [1]
OR Recovery (SD)	12 (4.6)	8.9 (1.7)	7.9 (2.6)	9.6 (4)	<0.0001 [2]
Ave PACU Recovery (SD)	78.2 (35.4)	83.9 (38.1)	66.6 (17.1)	72.6 (28.3)	0.0016 [3]
PACU Recovery					0.0078 [4]
<90 Minutes (%)	79 (80.6%)	13 (68.4%)	117 (92.1%)	209 (85.7%)	
90-120 Minutes (%)	8 (8.2%)	4 (21.1%)	6 (4.7%)	18 (7.4%)	
>120 Minutes (%)	11 (11.2%)	2 (10.5%)	4 (3.1%)	17 (7.0%)	
Spinal Procedure Time		18.2 (6.6)	8.9 (4.2)		<0.0001

1Differences in Induction times were statistically significant between all 3 groups.

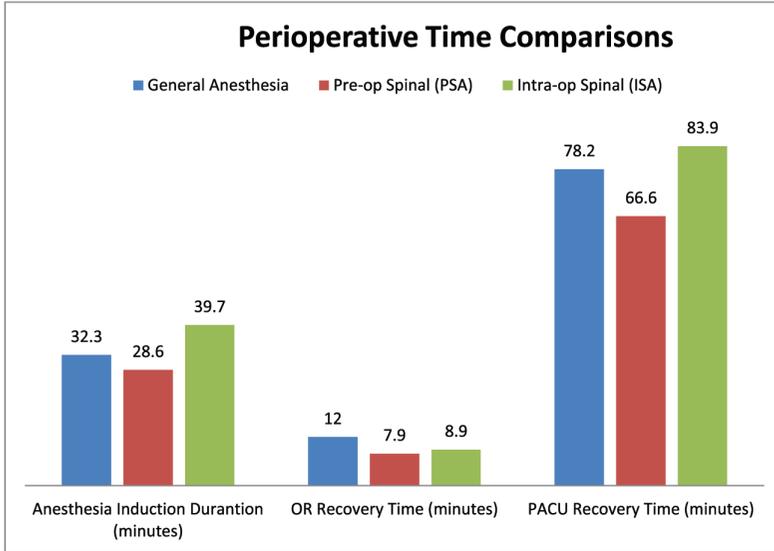
2Differences in OR Recovery times were statistically significant between all 3 groups.

3Statistically significant difference between GA vs PSA and PSA vs ISA but not between GA and ISA.

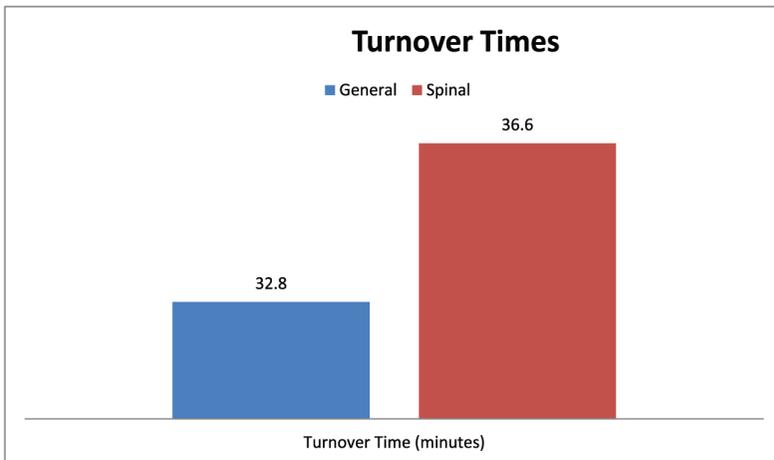
4Statistically significant difference between GA vs PSA and PSA vs ISA but not between GA and ISA.

8.2% of GA patients vs. 4.7% of PSA patients vs 21.1% of ISA had prolonged PACU recovery (90 minutes to 120 minutes) and 11.2% of GA patients vs. 3.1% of PSA patients vs. 10.5% of ISA patients had very prolonged PACU recovery (>120 minutes) (p=0.0078). Average PACU time was 72.1 minutes for all THA and 73.3 minutes for all TKA (p value 0.7). Average spinal procedure time was 8.9 minutes for PSA and 18.2 minutes for the ISA group (p value <0.001).

We analysed the OR turnover times to determine if the type of anaesthetic administered (GA versus PSA) affected the OR turnover times. The turnover time for the GA group (2nd case GA; GTO n=48) was 32.8 minutes (SD 6.0). The turnover time for the ISA group (2nd case spinal; STO n=58) was 36.6 minutes (SD 7.1). This turnover time difference did reach statistical significance ( $p=0.0034$ ) (**Fig. 4**). Turnover Time data was not available for the ISA cohort due to limitations with the charting system.



**Fig. 3.** Perioperative Time Comparisons.



**Fig. 4.** Turnover Times.

**Table 3**  
Vasopressor Administration.

	GA n=99	PSA n=128	ISA n=19	Total n=246	P value
High dose ephedrine (>25mg)	6 (6.1%)	22 (17.2%)	5 (26.3%)	33 (13.4%)	[1]
High dose phenylephrine (>500mcg)	38 (38.4%)	40 (31.3%)	12 (63.2%)	90 (36.6%)	[2]
Phenylephrine infusion	6 (6.2)	8 (6.4%)	4 (21.1%)	18 (7.5%)	0.1

1Statistical significance between GA and PSA and GA and ISA but not between PSA and ISA.

2Statistical significance between PSA and ISA.

For the PSA cohort there were no instances of high spinal anaesthesia, cardiac arrest or profound haemodynamic instability requiring resuscitation, or respiratory distress requiring airway interventions documented in the EHR. There were no clinical problems during transportation to the OR documented in the EMR. Ephedrine and/or phenylephrine administration was common in all three groups: GA 71/99 (71.7%), PSA 84/128 (65.6%), and ISA 18/19 (94.7%). Administration of high-dose ephedrine (>25mg), high-dosed phenylephrine (>500mcg) and phenylephrine infusion is presented in **Table 3**. Glycopyrrolate was administered to five patients in the PSA group and one patient in the ISA group for bradycardia; all of these events occurred in the OR. Atropine was administered to one patient in the PSA group in the OR after development of second degree AV block.

Pre-operative midazolam was administered to 60/99 (61%) in the GA group, 98/128 (77%) in the PSA group and 15/19 (79%) in the ISA group. Fentanyl was administered to 98/99 (99%) in the GA group, 51/128 (40%) in the PSA group, and 15/19 (79%) in the ISA group. Patients in the GA group averaged 1.1mg midazolam versus 1.6mg and 2.3mg in the PSA and ISA groups respectively (p value <0.001). Patients in the GA group averaged 158.2 mcg fentanyl versus 28.3mcg and 72.4 mcg in the PSA and ISA groups, respectively (p value <0.001).

## DISCUSSION

To our knowledge there have been no previous studies examining the feasibility, safety and peri-operative efficiency of pre-operative administration of spinal anaesthesia. However, there have been studies that have evaluated components similar to those in our study. It has been shown that interscalene blocks performed in a designated block room pre-operatively reduced OR time<sup>9</sup>. Torkki *et al.* demonstrated that when GA was induced outside of the OR prior to surgery, non-operative time was reduced by a mean of 45.6%. This allowed an additional case to be performed during a typical seven-hour workday<sup>10</sup>. It has also been demonstrated that performing thoracic epidurals in the pre-operative area saved 19.1 minutes per epidural compared to performance in the OR<sup>11</sup>.

In addition, a retrospective cohort study of 544 patients by Pierce *et al* evaluated the efficiency of spinal anaesthesia versus GA for lumbar spinal surgery. Spinal anaesthesia was associated with a shorter operative time, shorter anaesthesia time, less time from entering the OR until incision, shorter time from bandage placement until leaving the OR, and shorter hospital stay compared to GA<sup>12</sup>.

In this study, patient safety was a primary concern during the development of the PSA protocol. The most feared acute adverse effects of spinal anaesthesia are high spinal block with respiratory distress/failure (estimated incidence in one study 0.0037%)<sup>1</sup> and cardiac arrest (incidence of 0.04-1/10,000)<sup>8</sup>. Though rare, these are catastrophic complications and the PSA protocol included safety precautions to address these issues in the out-of-OR environment including immediate availability of airway equipment and emergency drugs as well as continuous physiologic monitoring and bedside presence of anaesthesia providers. One patient in the PSA cohort developed AV block during surgery and was administered atropine though the patient did not develop hypotension. Fortunately there were no serious adverse events reported in the PSA cohort and there were no adverse events reported during transportation to the OR.

Mild, transient hypotension following spinal anaesthesia is common (incidence of 33%)[8] and is typically treated easily with fluids and low-dose boluses of vasopressors such as phenylephrine and ephedrine. A majority of PSA (65.6%) and ISA (94.7%) patients in this study received intravenous ephedrine or phenylephrine following the spinal but low-dose vasopressors were very common in the GA cohort (71.7%) as well. High-dose ephedrine was more common in the PSA and ISA groups compared with GA (**Table 3**). High-dose phenylephrine was common in all three cohorts but was most common in the ISA group. Phenylephrine infusion was not common and there was no statistical difference between the three cohorts. Ultimately, the data on adverse events and vasopressor use show that PSA is as safe as ISA and GA in our practice setting.

The effects of PSA on peri-operative efficiency are less clear. Induction Time of the PSA cohort was 3.7 minutes shorter than the GA cohort and 11.1 minutes shorter than ISA cohort. The OR Recovery Time of the PSA cohort was 4.1 minutes shorter than GA cohort and 1 minute shorter than ISA cohort. Thus, on an average per case basis, PSA saved 7.8 minutes of OR time compared with GA and 12.1 minutes compared with ISA. Partly mitigating this time saving, average Turnover Time for PSA was 3.8 minutes longer than the turnover time for the GA cohort. Subtracting the turnover time from the intra-operative time savings, PSA saves an average of 4 minutes per case compared with GA. Assuming similar turnover times for GA and ISA (may not be a safe assumption but turnover workflow for ISA and GA are similar); PSA on the surface appears to save 8.3 minutes per case versus ISA.

Though small, the time differences demonstrated in our study offer the potential for significant cost savings in the OR. OR costs have been reported to range from \$30 to more than \$100 per minute<sup>13</sup> thus it is clearly important to maximise efficiency in order to improve the value of surgical care. Assuming that each minute of OR time is worth \$65 and that the intra-operative time for the PSA cohort was 4 minutes less than the GA cohort including turnover time, then a saving of \$260 per case can be expected.

Three cases per day performed with PSA would add up to 12 minutes less OR time and saving of \$780 per day of surgery. Over one month, assuming fifteen cases per week, the OR time savings would be \$15 600 and over one year would it be \$202 800. Using the same calculations, PSA would save 28.7 minutes per day compared with ISA (assuming the turnover times for the ISA cohort were the same as the turnover time for the GA cohort; that is 3.8 minutes shorter than PSA). If the same per minute cost estimate of \$65 was applied, the OR time savings over one year of PSA versus ISA would be \$485 030.

However, peri-operative efficiency is not simply about OR time. In addition to longer turnover time, the PSA patients require procedural time and resources from the anaesthesia team. Average procedural time for pre-op spinal was 8.9 minutes which only measures the time from skin prep to injection of the medication, it does not account for set up time, logistical work and utilisation of other personnel (sedation nurses, anaesthesia technicians) and resources. Thus, the time spent by the anaesthesiologist to perform one pre-operative spinal appears to cancel out the OR time savings when compared with GA and ISA. Comparing efficiency of PSA vs. ISA is more difficult because the ISA cohort was so small and we do not have turnover time for the ISA cohort. Spinal procedure time was lower in the PSA group compared with ISA which may be explained by differences in providers' record keeping in the OR versus the pre-op area (Initiation of spinal procedure may have been recorded upon entry into the OR as opposed to initiation of skin prep). It is also plausible that providers' procedural efficiency improved with the higher volume of spinals in the PSA cohort. Regardless, even in the best case scenario (assuming the most efficient version of PSA and the least efficient version of ISA) if we add the spinal procedural time (8.9 minutes) to the PSA Induction time (28.6 minutes) we get 37.5 minutes which is only slightly shorter than the Induction time for the ISA group (39.7 minutes). In summary, PSA does reduce time spent in the OR compared with GA and ISA, but the savings are small and appear to be largely cancelled out by the time spent performing the spinal before surgery.

Previous studies have shown that neuraxial anaesthesia decreased PONV and post-operative pain compared to GA which can have a significant effect on recovery<sup>3,4</sup>. Consistent with previous studies of the impact of spinal anaesthesia on PACU and hospital stay, our study demonstrated a shorter PACU length of stay for PSA compared with both GA and ISA, potentially a result of these factors<sup>5,7,13</sup>. Patients in the PSA cohort also spent 11.6 minutes less in the PACU compared with GA patients and 17.3 minutes less than the ISA cohort. The difference was primarily due to the PSA cohort having fewer patients requiring prolonged and very prolonged PACU stays (**Table 2**). It was difficult to pinpoint the exact reasons for the prolonged PACU stays in these patients from retrospective review of the EHR. There were no critical airway interventions or other emergent events documented in the EHR. Our practice has a standardised set of discharge criteria that was previously described and these were applied consistently throughout the entire study period. Both the GA and ISA groups had higher average ASA scores which is certainly a potential confounder. The meaning of the ISA PACU times is also hampered by the small size of the cohort. Though a per minute cost of PACU stay can be difficult to estimate, delay in discharge from PACU has been shown to lead to OR delays, cancellation of cases, altered PACU staffing requirements, increased costs, and decreased patient satisfaction<sup>14</sup>.

Aside from the potential OR and PACU efficiency benefits, there are several other potential advantages of performing pre-operative spinals. A study of 119 patients undergoing surgery under regional or local anaesthesia assessed the factors that contributed to patient anxiety during the peri-operative period. Nearly half the patient population reported that the sight of technical equipment in the OR increased their anxiety the most<sup>15</sup>. Performing the spinal in the pre-operative area decreases the time patients are exposed to the OR environment in a vulnerable position with only moderate amounts of sedation to facilitate block positioning. In addition, compared with the often busy and high production pressure environment of the OR, the pre-operative setting may be a more favourable environment for anaesthesia providers, particularly trainees, to successfully perform the spinal block. Bensouda *et al* demonstrated that increasing the number of observers increased the stress levels of trainees performing endotracheal

intubation<sup>16</sup>. Finally, performing the spinal in the pre-operative area reduces the traffic into and out of the OR which has a theoretical benefit in terms of infection control. There are a number of non-surgical personnel that assist in performing a spinal, and after sterile surgical equipment is opened it becomes important to limit the unnecessary movement around an OR to prevent potential contamination. One study evaluating total OR door openings during TJA found that by significantly reducing the number of OR door openings the surgical site infection rate decreased from 2.8% to 2.1%<sup>17</sup>.

Our study has several strengths. First, all surgeries were performed at a single center by a single surgeon which reduces the variability of the data. Second, the clinical question being evaluated was straightforward, and the data is statistically significant. Conversely, our study has several limitations. First, the time differences among the groups are small and may not translate into easily noticeable improvements in OR efficiency on a day-to-day basis. Second, the GA cohort had more co-morbidity, evidenced by the higher ASA score. This has the potential to confound some of the time frames, particularly the PACU duration. The number of patients in the ISA cohort was also significantly lower than the other two cohorts and the data on Turnover Times were difficult to obtain which limits the conclusions that can be drawn in comparing PSA with ISA.

Furthermore, it is possible that the longer Induction Time for the ISA group is simply due to the fact that anaesthesia providers in our practice were not performing spinal routinely during that time period. If an ISA protocol were to become routine, perhaps the Induction Time would drop as the anesthesiologists grew more comfortable with the practice.

Finally, the cost saving estimates we have performed are illustrative but do not tell the whole story. First of all, the estimates are assuming a total conversion to PSA; in the real world, a sizable number of patients undergoing TJA will continue to require GA. Secondly, there are other costs to be considered aside from OR time. Performing spinal anaesthesia outside of the OR still requires the time of the anaesthesia provider as well as additional personnel and equipment; these are difficult to quantify with a dollar value but are still real costs in terms of time and resources. In addition, we were able to execute this resource-intensive practice because we utilise the anaesthesia care team model. In practices in which anaesthesiologists are practicing alone, PSA may not be a safe or logistically practical option.

#### *Future Directions*

Our data demonstrated two primary areas in which we could improve efficiency for PSA. In-OR to intubation time was 11.7 minutes in the GA cohort, yet the Induction time for PSA was only 3.7 minutes shorter than GA despite the anaesthesia being essentially complete on arrival to the OR. Further research is needed to elucidate the reasons behind this discrepancy but process improvements could be implemented by the OR team to streamline the surgical preparation after the PSA patient enters to OR. In addition, assuming appropriate preparation, PSA should not have a significant impact on Turnover Time. Potential processes to decrease PSA turnover times could include improving communication between the anaesthesia, OR and pre-operative teams in order to properly time the spinal and to have a dedicated anaesthesiologist to perform neuraxial and regional anaesthesia. Finally, now that spinal are more routine in our practice, we would like to evaluate the efficiency of performing routine intra-operative spinal again; it is conceivable that with a standardised process, the traditional approach will prove to be the most efficient.

## CONCLUSIONS

The results of this retrospective cohort study demonstrate that administration of spinal anaesthesia in the pre-operative area for total joint replacement is as safe as ISA and GA in our practice. In addition, pre-operative spinal marginally reduces time spent in the OR compared with GA and ISA but at the cost of longer turnover times and more time and resources spent by the anaesthesia providers performing the procedure before surgery.

Credit authorship contribution statement:

*Matthew L Ritz*: Conceptualization, Methodology, Data curation, Visualization, Writing - original draft.

*David M Rosenfeld*: Conceptualization, Methodology, Writing - review and editing.

*Mark Spangehl*: Conceptualization, Methodology, Writing - review and editing.

*Lopa Misra*: Conceptualization, Methodology, Writing - review and editing.

*Narjeet Khurmi*: Conceptualization, Methodology, Writing - review and editing.

*Richard J Butterfield*: Methodology, Formal analysis.

*Matthew R Buras*: Methodology, Formal analysis.

*Andrew W Gorlin*: Conceptualization, Methodology, Data curation, Visualization, Writing - original draft, Writing - review and editing, Supervision.

Declaration of Conflicting Interests:

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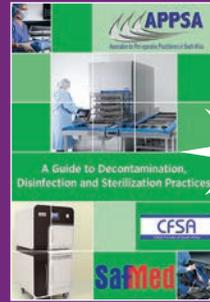
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# APPSA GUIDELINES



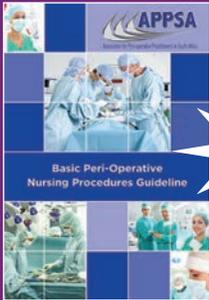
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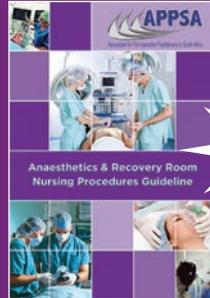
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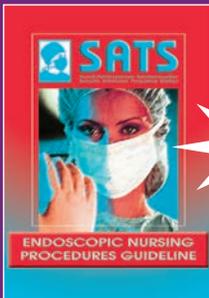
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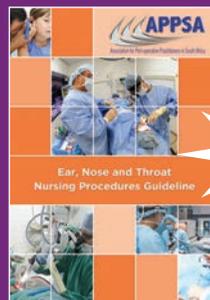
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