

The Dissector

Journal of the Perioperative Nurses College
of the New Zealand Nurses Organisation

June – September 2025 Volume 53, Number 1

OBITUARY

Christchurch's Sue Claridge fondly remembered



EDUCATION: Exploring Electrosurgical Smoke Control Practices

CLINICAL: Negative Pressure Pulmonary Oedema

FROM THE ARCHIVES: Documentation of the Surgical Count

HISTORY: 50 Years of The Dissector



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Spring has sprung...

Tēnā koutou katoa. Welcome to this issue of *The Dissector*. It's great that it's feeling like spring again, after another long and tiring winter. It feels like we've had more ills and chills than last year, so I hope that you've managed to find time relax and unwind, which is so important in these tough times. You may have noticed that we didn't produce a mid-year journal this year. Unfortunately we've really struggled to get enough articles. Alongside this, our publisher has been working hard to ensure that the journal pays for itself with advertising, which is also challenging at the moment.

You'll see that we are continuing to publish historic articles, and, whilst these are still incredibly relevant, we also really like to include new content. We'd love to see the results from your post-graduate study published in *The Dissector*, which is a wonderful way to share your learning with others. If you are currently studying (or have recently finished) please consider submitting your assignments or research results. Don't worry if you've never been published before, we'll happily provide guidance and support! You can contact us on dissector.editor@gmail.com and one of our friendly Editorial Committee members will be in touch. Alternatively you can find out more by reading our [writing guidelines](#).

Negative Pressure Pulmonary Oedema

This issue features an article from Editorial Committee member Amber Cox, on Negative pressure pulmonary oedema (NPPO). Amber presented on this at last year's PNC Conference. Her article focuses on the incidence, causes, pathophysiology and diagnosis of this life-threatening complication that results from an upper airway obstruction. She discusses the classical signs and symptoms of hypoxaemia and haemoptysis seen in NPPO with a pathophysiological perspective derived from the available literature.

Poster presentation

Also from last year's conference, we have an article from Assunta Rodrigues which has been extracted from a poster she presented from her research on electrosurgical smoke control practices. Assunta's full research was published in *The Dissector* Vol. 52, No. 2, September – November 2024, and at conference, she won the Debbie Booth Memorial Travel Award for the best perioperative practice focused paper presented at the Free Paper Session.

Acknowledging Sue Claridge

We were saddened to hear of Sue Claridge's passing at the end of June this year. Sue was a passionate advocate for perioperative nursing and her involvement with PNC spanned decades, contributing at both local and national levels. Sue served on the Editorial Committee from 1998-2000 and was Chief Editor from 2000-2003. We have included one of Sue's articles from our archives about the 100-year commemoration of Florence Nightingale in this issue. It is a great reminder of why international nurses day is celebrated each year on May 12 - Florence Nightingale's date of birth.



Celebrating our national journal

We have also included an article on the 50-year history of *The Dissector* in this issue, based on a talk on the same from last year's conference. Our publisher, Michael Esdaile, with his long history working with PNC and our Editorial Committees, has added content to make it a bit more interesting. We also include another article from one of our stalwart PNC members. In 1998, during her last term as National Chair, Jean Koorey took on the role of Chief Editor for *The Dissector*, turning it from floundering to a thriving journal. Jean Koorey's article, discussing documentation of the surgical count, is as relevant today as the day it was written.

Expressions of interest

You may have seen an expression of interest for the Chief Editor, along with those for other National Committee positions. I am about to complete my fifth year and it is time for fresh ideas and leadership for our national journal. If you are interested in this exciting and challenging role, please consider submitting a letter expressing your interest with a copy of your CV to the PNC secretary on periop.sec@gmail.com.

For further information on the role and responsibilities of the Chief Editor or membership on the Editorial Committee, please contact *Dissector* Chief Editor on dissector.editor@gmail.com.

Noho ora mai

Bron Taylor, Chief Editor

THE DISSECTOR

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Touching Base

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Time for fresh voices

As we transition to the summer months, I want to take a moment to acknowledge the ongoing challenges many of us face across the perioperative nursing profession.

The demands on our time, skills, and wellbeing remain high, and I sincerely hope that each of you has managed to stay well and find support during what can be a particularly intense time of year.

Despite these pressures, your continued dedication to delivering safe, high-quality care in the perioperative environment is truly commendable.

Amid these challenges, I am excited to share that the Perioperative Nurses College has a number of wonderful opportunities to get involved at a national level. We are currently seeking passionate, forward-thinking perioperative nurses to join our National Committee. As a newer committee, this is an ideal time to step in — we are in a phase of rapid growth and development, and we are looking for fresh voices and ideas to help shape the future direction of the college.

It is a chance to be part of something significant, contribute to national conversations, and make a lasting impact on the

profession we all care so deeply about.

Already, we have begun making progress. One of our key recent initiatives has been a formal submission to the Nursing Council of New Zealand regarding the draft education standards. Our submission highlighted the need for greater perioperative nursing content and clinical exposure at the undergraduate level. This is a vital step toward ensuring the future workforce is informed, prepared, and inspired to pursue careers in our specialty. Advocacy and education will remain strong focus areas for us moving forward.

As this was being typed, we were also preparing for our Annual General Meeting (AGM) to be held in Auckland. This will be a fantastic opportunity for members to come together, reflect on our progress, and plan the next phase of our journey. Whether you're a seasoned perioperative nurse or early in your career, we encourage you to consider joining us and being part of a motivated, collaborative team working to elevate and advance perioperative nursing across Aotearoa.

More on the AGM next issue.

Ngā mihi nui,

*Emma Ladley Chair,
Perioperative Nurses College*

370 perioperative nurses strike in Auckland

About 370 perioperative nurses across Auckland City, Starship and Greenlane hospitals, began a month-long strike in June which will see them refuse to be on-call for after-hours surgery.

According to the New Zealand Nurses Organisation (NZNO) on-line publication *Kaitiaki Nursing New Zealand*, NZNO delegate Haim Ainsworth said with no permanent overnight perioperative coverage and “chronic” staff shortages, nurses had a rotating on-call night roster at the three hospitals.

But instead of going home for a break between their regular shift and being on-call overnight, nurses often felt forced to stay on to care for patients. This was because of their duty of care to patients under the Nursing Council's code of conduct — but also an assumption from management they would stay on instead of asking permission before surgery began.

That meant nurses often ended up working several hours into the night, on the back of a 10-hour shift. This was hugely risky to both patients and nurses, Ainsworth said.

“Who do you want at 3 o'clock in the morning? Somebody who's already worked their 10-hour shift? Or someone who's got home and had their hour-and-a-half of sleep and then come back again?”

Often, the on-call nurse then had to return for another full shift, Ainsworth said.

“They'll be on call and very often back the next day. Even with the mandated nine-hour break, it still means people aren't sleeping properly, aren't getting a full night's sleep, and not getting away from the job — so they're tired and exhausted.”

“They'll be on call and very often back the next day. Even with the mandated nine-hour break, it still means people aren't sleeping properly, aren't getting a full night's sleep, and not getting away from the job — so they're tired and exhausted.”

Southland nurses march

On July 30, 2025, New Zealand Nurses Organisation (NZNO) members marched from Southland Hospital to the corner of Tay and Elles Road, backed up by members of the Association of Salaried Medical Specialists (ASMS) and the NZ Professional Firefighters Union (NZPFU).

The *Christchurch Press* reported that “eleventh hour mediation between Te Whatu Ora and NZNO failed and Southland Hospital delegate Maïke Rickertsen said it felt like the health agency was rolling back safe staffing measures like the Care Capacity Demand Management programme because it highlighted the extent of workforce shortages.”

Earlier in July, NZNO member Charleen Waddell said that only half of hospital shifts across Southland and Otago in the past six months had been fully staffed while only nine percent of night shifts were fully staffed.

Nurses were working double shifts and burning out.

ASMS Southland branch president Dr Roger Wandless said ASMS shared the same concerns as nurses about the direction the public health system was moving in. They were worried about short staffing and surgeries being cancelled, and the system needed investment, he said.

“Ultimately, we worry about the quality of healthcare we can provide the community.”

NZPFU local union secretary Aaron Ramsey said members were supporting nurses because “it's a fight very close to our hearts”.

“We're having to beg for our existence every couple of years as the nurses do because no one will offer a fair offer reflective of the cost of living,” he said.

Continued page 8.

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NZNO College Conferences

PNC Conference, Expressions of Interest

The biennial Perioperative Nurses College Conference is set for Auckland in 2026. The National Committee has commenced planning for the Conference, and is seeking members from the Auckland-Northland Region to join the Conference Planning Committee.

This group will work alongside the National Committee to help coordinate local arrangements, liaise with venues and suppliers, and contribute to the successful delivery of a high-quality event for College members. If you are enthusiastic about showcasing Auckland and contributing to the success of our biennial conference, we would love to hear from you. Please submit your expression of interest to [Emma Ladley](#).

Stomal College Conference

The NZNO College of Stomal Therapy Nursing is holding its 2026 Conference in Christchurch from March 5-6, 2026. It promises to be a gathering of leading professionals and experts in the field of stomal therapy nursing.

The conference is being organised with the Medical Technology Association of New Zealand (MTANZ) and will be held at the Novatel Christchurch Airport. The conference theme is 'Resilience'. For more details, click [here](#).

Infection Prevention Conference

The 2026 Infection Prevention & Control Nurses College (IPCNC) Conference is being held in Wellington from August 26-28, 2026. The theme is "Lights, Camera, Prevention!". This

reflects the evolving challenges and innovations shaping the infection control field.

The venue is the Takina Events Centre.

The IPCNC is the principal organisation representing infection prevention and control practitioners in New Zealand and it is a professional speciality College of the New Zealand Nurses Organisation with more than 600 members, working in both the public and private sectors.

Over three days, new strategies, technologies, and collaborative approaches to strengthen infection prevention and control across all healthcare and community settings will be explored.

All Healthcare professionals including but not limited to nurses, doctors, allied health and others interested in infection prevention and control are invited.

For more information, click [here](#).

Steris goes direct...

Steris has taken over direct distribution of its product range in New Zealand. The new company is Steris New Zealand and is headed by Business Manager Christopher Willams.

The Steris range was previously handled by Device Technologies.

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A LIFE OF DEDICATION:

Remembering Sue Claridge

1955-2025

RN, BN, Adv. Dip. Nursing, PgDip Health Science

By Marilyn Casey

It is with profound sadness that we bid farewell to Sue Claridge, a cherished colleague, mentor, and friend whose legacy will resonate throughout the perioperative nursing community of Christchurch and New Zealand.

Sue passed away at her Hoon Hay home on the weekend of June 28-29.

Sue's nursing journey began at Princess Margaret Hospital, where she trained from 1974 to 1977, graduating as a Registered Nurse. Her early career saw her working across various healthcare settings, but it was in 1987 that she found her true calling at St. George's Hospital Theatres in Christchurch. There, she flourished in both the Main Theatre and Day Surgery Unit, remaining a steadfast presence until her retirement in 2022 — save for a two-year stint in the United Kingdom (2005-2007), where she successfully established a Day Surgery Unit as a theatre manager.

Affectionately known by colleagues as “SueMac,” “Smack,” or “Sister Supine” in the orthopaedic theatres, Sue was a nurturing figure to many. She lovingly referred to student nurses and new staff as her “Chickadees,” while they fondly called her their “Theatre Mother.”

Her warmth, humour, and unwavering support made her a pillar of the operating room and a beloved mentor.

Beyond her clinical role, Sue was a passionate advocate for perioperative nursing. Her involvement with the



Perioperative Nurses College (PNC) of NZNO spanned decades, contributing at both local and national levels.

“I cannot recollect a time when I was not a PNC member,” she once said, a testament to her enduring commitment.

Sue's editorial contributions to *The Dissector* were significant. She served on the Editorial Committee from 1998-2000 and as Chief Editor from 2000-2003. Her talent for encouraging others to share their experiences and insights enriched the journal and inspired many to contribute. Her leadership roles included:

- National Committee Member, Perioperative Nurses College of NZNO

- Secretary, Canterbury-West Coast PNC
- Chairperson, Canterbury-West Coast PNC (2009-2012)
- National Secretary, PNC of NZNO (2016-2019)

Sue's influence extended to conference planning and international representation. She played a key role in organizing the **AORN** 12th World Conference in Christchurch in 2001 and was instrumental in planning the 2022 Christchurch National Conference, where she was honoured with life membership.

Outside of nursing, Sue was a woman of many talents. A passionate philatelist, she was an international judge of stamp collections and a gold medal winner for her Florence Nightingale exhibition-featured in *The Dissector* (Vol. 38, No.



Sue with long serving Perioperative Nurses College secretary/treasurer Berice Beach.

3, December 2010).

She also had a keen interest in history, particularly in collecting historical hospital postcards from across New Zealand. In 2025, she was actively involved in re-establishing the Pat Cotter Medical Museum in Christchurch, helping to re-catalogue and restore its displays following the 2011 earthquakes.

Sue was a tireless advocate for perioperative nursing, always encouraging membership, professional development, and community engagement. Her sudden passing over the weekend of June 28-29, 2025, has left a void in the hearts of many.

Sue Claridge will be remembered not only for her professional excellence but for her kindness, humour, and unwavering dedication to the nursing profession.

She was a true friend, a guiding light, and a legacy that will continue to inspire generations of nurses to come.

Sue Frost remembers:

When I returned from the USA – Sue and I spent a weekend, in a boardroom at the old St Georges Building, writing the first set of NZ Perioperative Nursing Standards – that were then distributed around the country for input / clarification and adoption. That would have been about 1991. Maybe 1992. Was a fun filled weekend as we debated our NZ Standards of care against the Australian and American documented standards of care.

Christchurch Philatelic Society remembers

By Paul van Herpt

Sue Claridge was one of our Life Members.

When it comes to organised philately, the list of what Sue has been involved with is monumental and the shorter list would actually be what she hasn't done.

That short list probably includes not spending enough time on her own collections. A brief selection starting with the Christchurch Philatelic Society where she had a long involvement on the Committee including holding roles as President and Secretary amongst others.

She was also a philatelic judge and Commissioner serving at many New Zealand and overseas exhibitions, helped run the Christchurch youth club and hosted Stamp Camps in Canterbury. She also held the post of Secretary with CANPEX, the Christchurch-based exhibition organising group.

Her death came as a shock to all who knew Sue, and let's be honest, most philatelists in New Zealand knew Sue.

She had a long and distinguished time in various roles in the Philatelic Youth Council and there are many younger philatelists who benefitted from her wisdom.

She had a very wide collecting interest including included military, medical, ophthalmology, hospitals, Florence Nightingale, Edith Cavell and World War I.

Sue served on the Federation for a long time and gave talks to many member societies. Outside philately she was a very keen gardener.

She will be greatly missed. ■



Sue holidaying in Los Angeles.

Florence Nightingale Commemorated

By Sue Claridge



Florence Nightingale's achievements have been commemorated in many ways, including on an English 10 Pound note.

THE one hundred year anniversary of Florence Nightingale's death in August 1910 has been commemorated by several countries, the most significant being Great Britain, which produced a £2.00 coin in August.

Florence Nightingale was one of the most extraordinary women known to history with her life being documented in numerous publications. In 2010 many venues commemorated the one hundredth years anniversary of her death. Annually 'nurses day' is celebrated on May 12 – Florence Nightingale's date of birth. The Nightingale Pledge taken by new nurses was named in her honour and the annual International

Nurses Day is celebrated around the world on her birthday.

Known as the 'Lady with the Lamp, Saint Florence and Matron of Scutari', Florence always wanted to achieve independence as a woman and was convinced that she had a God-given talent to make a difference to society. She departed from several traditional Victorian English customs by becoming educated, turning down numerous proposals of marriage and training as a nurse when it was considered 'a lowly profession'.

Daughter of William Nightingale of Embly Park, Hampshire, United Kingdom, Florence was born on May 12, 1820 in Florence, Italy, where her wealthy parents had been living at the time. She had a privileged childhood and by the age of six Florence was writing letters, keeping a journal and was being tutored by her father in languages, mathematics and history.

Florence began making plans to train as a nurse as early as 1845; however it wasn't until 1850 that she overcame parental oppositions and persuaded them to allow her to train with the Deaconess Mission in Ger-



Above: Over the years, Florence Nightingale's life has been commemorated by many nations through the issue of postage stamps bearing her image. Left: The Great Military Hospital at Scutari, a lithograph by Thomas Packer, February 24, 1855. © Florence Nightingale Museum.





Left: *The Mission of Mercy: Florence Nightingale receiving the wounded at Scutari. A oil on canvas painting by Jerry Barrett, 1857*

many. Total breakdown of parental resistance took place in 1853 when she was appointed Superintendent of the London Hospital for invalid gentlewomen.

Britain went to war with Russia in 1854 and the subsequent *Times* newspaper reports caused Florence to interview and select nurses to travel to Scutari – and the myth of Florence Nightingale was born.

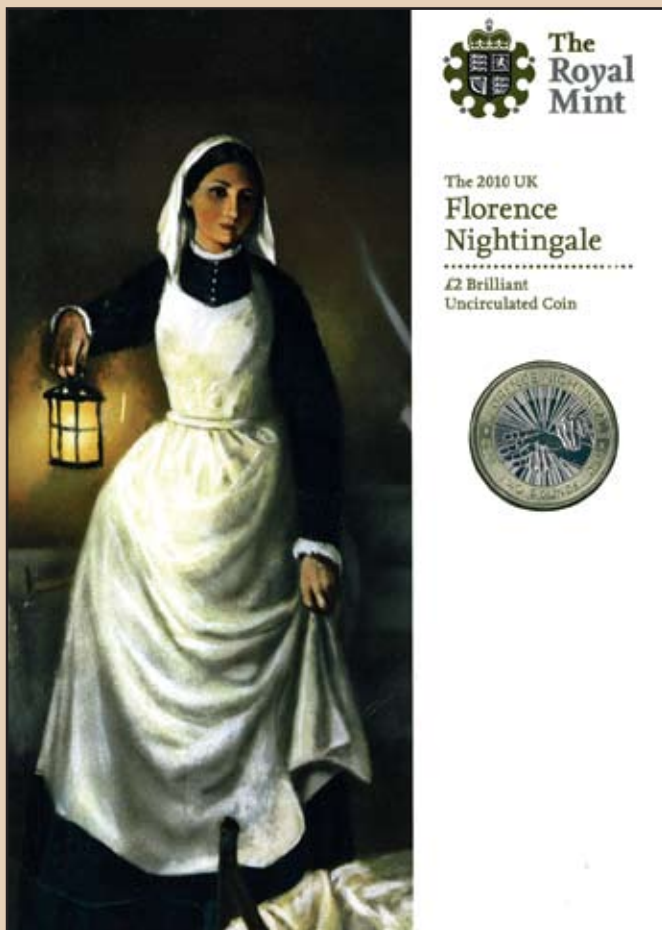
Her works at Scutari are now part of history and her efforts during that time in caring for the sick and wounded soldiers would make her the greatest pioneer of the nursing profession. Unfortunately, during her time in the Crimea, Florence contracted a condition called Crimean Fever that would subsequently affect her health in later years.

During the post-Crimea War years, Florence continued to write, lobby the English Parliament and publish pamphlets and books in relation to health.

In 1882 she inspected the Nightingale Training School and in 1887 she voiced her opposition to the registration of nurses! Her final text, *Sick Nursing and Health Nursing* was read at the nurse's congress at the Chicago World's Fair. Florence died August 13, 1910 and is buried in St. Margaret's Church, East Wellow – she did not wish to be buried in Westminster Abbey.

In the last 25 years of her life she was a frequent visitor to Claydon House, Buckinghamshire (her sister's home) and the author was privileged to wander through her rooms one hundred years after her death, and view historic displays. ■

Footnote: The author would welcome any examples of memorabilia relating to Florence Nightingale – contact sueclaridge@xtra.co.nz



Top: Claydon House, where Florence Nightingale was a frequent visitor in the latter part of her life. (Photo, Sue Claridge).

Above: One of the rooms used by Florence Nightingale at Claydon House. (Photo, Sue Claridge).

Left: In August 2010, England issued a £2 coin to mark the centenary of Nightingale's death.

Reflections from Boston: A New Zealand Chairperson's Experience at AORN 2025

By Emma Ladley

I had the pleasure of representing New Zealand's perioperative nursing community at the 2025 Association of perioperative Registered Nurses (AORN) Global Surgical Conference & Expo in Boston.

This conference was inspiring and brought some great research and innovative ideas. The talks that I was able to attend were

- The role of emotional intelligence: management of bullying in the perioperative context;
- Sustainability within the perioperative services and beyond the closed doors;
- Surgical smoke safety: Implementation of an evidence-based algorithm;
- Presentation to manuscript: Avoiding imposter syndrome;
- The opening ceremony;
- Safety checklists: The good the bad and the missing;
- Video-sim workplace violence workshop: Incivility;
- The courage to be together;
- Beyond burnout: AI powered staffing solutions for today's OR nursing challenges;
- Embracing OR safety: AI-powered surgical instrument counting;
- The impact of the patient ambassador role on quality outcomes in the perioperative services;
- We're all in this together: Challenges in perioperative practice. International ed.;
- Perioperative innovation: transforming surgical care delivery.



Emma Ladley at the 2025 AORN Conference in Boston



The exhibition hall was huge.

When not at the speaker sessions, I was exploring the huge range of trade and exhibition stands. There were a lot of new technologies and ideas being shown.

The posters that were displayed showcasing research from perioperative nurses was incredible.

There was also an international lounge where I was able to connect with nurses from all over the globe.

Global Insights, Local Impact

One of the most powerful takeaways for me was the global nature of the discussions. While our challenges in New Zealand may differ in scale or structure, the core themes — patient safety, workforce wellbeing, leadership resilience, and adapting to rapid healthcare changes — resonated universally.

It was heartening to see how nurses from different countries are tackling similar issues, and it reaffirmed the value of our ongoing work back home.

Bringing It Home

On return to New Zealand, my mind was buzzing with ideas — from sustainability and education to patient advocacy and staff wellbeing. Conferences like AORN 2025 remind us that while our healthcare environments may differ, our purpose does not.

I am incredibly grateful for the opportunity to attend, and I am committed to bringing these insights home to continue strengthening perioperative nursing in Aotearoa. ■

Documentation of the Surgical Count

By Jean Koorey RN. BN. NCAET

This issue's From the Archives article was first published as a Literature Review in Vol. 34, No. 4 (March 2007), pages 24-30. Thanks to Karen Hall for her diligence in the archives of the New Zealand Nurses Organisation.

INTRODUCTION

"THERE'S a swab missing!" These words can put dreaded thoughts into the minds of Perioperative Nurses involved in the surgical count. Will the surgeon take them seriously, will it be found? If not, what are the consequences?

The practice of the counting of items used during a surgical procedure has been undertaken for many years.

New Zealand has a population of 4,142,163 people (New Zealand Statistics, 2006), a percentage of whom will experience a surgical procedure in one of the many and varied surgical facilities in the country. Each facility may or may not develop its own policy involving all aspects of managing the surgical count, including how the surgical count is documented. Does having this option lead to processes that may potentially cause the patient harm?

The following discussion examines the current literature on the surgical count and in particular how it is documented.

The purpose is to identify whether current practice regarding the surgical count at Hastings Hospital in the Hawke's Bay District Health Board (HBDHB) needs to be amended.

DEFINITION

Performing counts of sponges, sharps and instruments is the Perioperative Nursing activity of accounting for items to ensure they are not retained in the surgical wound after closure. This crucial activity is an integral component of safe Perioperative Nursing practice that is linked to codes

and standards of practice. Phippen and Wells state: "as Perioperative Nurses have a grave responsibility to provide safe patient care, sponge, sharp and instrument counts should be considered for every surgical procedure to ensure the patient is not injured as a result of a retained foreign body" (1994, p180).

CURRENT PRACTICE

In the Perioperative Unit at Hastings Hospital, the Perioperative Nurses are required to practice in accordance with the Surgical Count Policy (HBDHB, 1999). The policy describes the surgical count as being documented on a count board in the first instance and then transcribed to the patient's intra-operative record - transcribing being the act of "copying" to another location the exact wording that was originally documented (Collins Dictionary, 2000, p580).

The first count is undertaken by the scrub nurse and circulating/count nurse prior to the commencement of the skin preparation of the patient. The undertaking of the count is just one of many activities required in preparation for the commencement of a surgical procedure. For example, determining that the patient's surgical and anaesthetic consent have been obtained and preparing for the positioning of the patient are just two of the activities that have an influence on the timing of the first surgical count.

Once the surgical count has commenced with the scrub nurse and the circulating/count nurse, the circulating/count

nurse documents/records the totals on the count board. The information documented is verified by the scrub nurse. Subsequent additions to the count, if not added by the circulating/count nurse, are documented on the count board and the addition is initialled by the nurse involved with the addition.

At an appropriate time after the first surgical count has been documented on the count board, the circulating/count nurse transcribes this information into the patient's intra-operative record. Depending on clinical demands of the staff this may not be for some time after the surgery has commenced.

The second count with the scrub nurse is undertaken at the time of closure of a cavity and all totals are then documented on the count board by the circulating/count nurse who undertook the first count. Additions made to the count are recorded in the patient's intra-operative record by the circulating/count nurse.

If the second count is incorrect, the scrub nurse is informed immediately. The scrub nurse passes this information on to the surgeon. A protocol is then followed that contains measures to find the missing item.

At the time of skin closure or completion of the surgery, a third count is undertaken by the scrub and circulating/count nurse. The circulating/count nurse documents the totals on the count board and in the patient's intra-operative record. The scrub nurse is informed of the outcome and subsequently informs the surgeon. If the third count is incorrect, the surgeon is informed. The Incorrect Count Policy is then followed. The count is signed for by both nurses involved in the count prior to the patient being transferred from the theatre.

HISTORY OF SURGICAL COUNT

An unknown author's article states that "historically counts began as a process to prevent the loss of marine sponges during surgical procedures and evolved to routinely include instruments" (Unknown, 2006, p30).

From an historical perspective in New Zealand, a chalkboard with painted lines and a list of the items to be counted was the tool used to record the count in the 1970s. The scrub nurse informed the surgeon as to the outcome of the count and signed the operation register in the appropriate place. Documentation in the patient's records was not undertaken and the surgeon was ultimately responsible.

In the case *Lewis v Physicians Insurance Company et al* (627 NW2d 484 [Wis 2001]) in the United States of America (USA) the Supreme Court declined to adopt the "Captain of the Ship" doctrine and described the doctrine as "antiquated" (cited Murphy, 2001, p 525).

In recalling an example from the author's experience when a swab was confirmed as unaccounted for at the time of skin closure and surgeons have been informed of the situation, comments to nurses have varied from "thank you", to "just testing". However, for the patient, getting the surgical count right during every procedure is imperative.

Accountability for the outcome of the count is now a shared responsibility between the two nurses involved in the count and the surgeon. However, if a nurse informs the surgeon the count is correct when an item is retained, then the nurse will be held accountable. The professionalism of nursing and therefore the accountability for one's practice is now embedded.

LEGISLATION

In New Zealand there are key acts of parliament and codes of practice governing accountability and professionalism within nursing practice. The Nursing Council of New Zealand (NCNZ) Competencies for the Registered Nurse Scope of Practice is required to be met by nurses to maintain their competency to practice. Competency 1.4 "promotes an environment that enables client safety, independence, quality of life and health" (NCNZ, 2006, p 4) and has two performance criteria indicators documented that are especially relevant. These being, "identifying and reporting situations that affect client or staff members health or safety" and "recognising and managing risks to provide care that best meets the needs and interests of clients and the public" (NCNZ, 2005, p 4).

Principle Two of the New Zealand Code of Conduct for Nurses states that "the nurse acts ethically and maintains standards of practice" (NCNZ, 2006, p 4). Some of the criteria from the Code of Conduct related to the surgical count include that "the nurse uses knowledge and skills for the benefit of patients", that "the nurse is accountable for practicing safely within his/her scope of practice", that "the nurse maintains and updates professional knowledge and skills in an area of practice", and that "the nurse accurately maintains required records related to nursing practice" (NCNZ, 2006, p 4).

The philosophy of the national professional body for Perioperative Nurses, the Perioperative Nurses College of the New Zealand Nurses Organisation (PNC^{NZNO}), states that "Perioperative Nurses demonstrate responsibility and accountability for their practice" (PNC^{NZNO} 2005a, p 4). The introduction of tertiary education for nursing, progressing to Bachelor of Nursing courses in 1986 and now Masters of Nursing and Doctorate of Nursing, have increased the professionalism of nursing. The other significant impact on nursing has been the ratification of two Acts: the Health and Disability Commissioner (HDC) Act (1994) and the Health Practitioners Competence Assurance (HPCA) Act (2003).

The purpose of the HDC Act is "to promote and protect the rights of health consumers and disability services consumers, and in particular, to secure the fair, simple, speedy and efficient resolution of complaints relating to infringements of those rights" (Ministry of Health [MOHi, 2006]). The Code of Health and Disability Services Consumer Rights and Regulation, (1996) was developed from this legislation. In Clause 2, the ten rights of consumers, the duties of providers are detailed. Right 4: the right to services of an appropriate standard of care applies to all Perioperative Nursing practice and especially relates to undertaking a surgical count (MOH, 2006). The HPCA Act (2003) seeks to attain a principle purpose of providing for a consistent accountability regime for all health professionals (MOH, 2006).

PROFESSIONAL

The Perioperative Nurses College of the New Zealand Nurses Organisation (PNC^{NZNO}) has evolved from The National Theatre Nurses Special Interest Section which was formed in 1969. One of the criteria for being recognised as a College under the umbrella of the New Zealand Nurses Organisation (NZNO) is to have a published document that outlines standards of practice. One of the standards in the *Recommended Standards, Guidelines and Position Statements for Safe Practice in the Perioperative Setting* outlines the minimum standard for the surgical count. The Surgical Count -

Recommended Practice 1 states “that all operating theatre suites must have a written policy, protocols or guidelines, defining the requirements for instruments, swabs, sharp and disposable items, counted during surgical procedures” (PNC^{NZNO}, 2005b, Section 5/2, p 2).

Criteria described include that documentation to record the count must occur during the procedure and in the patient’s health record, (PNC^{NZNO}, 2005b). An example of a recommended procedure for “counting of instruments and swabs during a surgical procedure” is documented in the PNC^{NZNO} Standards. One of the bullet points states “as each item is counted, it is recorded on the swab count sheet or board (depending on facilities)”. Another bullet point states: “the count status is documented in the patient record, as prescribed by the facility policy”. The final bullet point states: “Documentation regarding the Count is signed by all nurses that contributed to the count, in the patient’s notes” (PNC^{NZNO}, 2005b, Section 5/2, p2).

Another criteria for being a College of NZNO is that

Perioperative Nurses have established international links. It is through these links that access to International Professional Standards are sourced.

The Australian College of Operating Room Nurses (ACORN) standard on the “counting of accountable items during surgery” in Standard Statement 6, criteria 6.1 states that the nurse “shall ensure a paper-based approved perioperative documentation (APO) is used” (ACORN, 2005, S3, p 6). Criteria 6.5 states that “the APO is signed by those two nurses responsible for the count” (ACORN, 2005, S3, p 6). Criteria 6.7 states that “the original copy of the APO is placed in the patient’s medical record” (ACORN, 2005, S3 p 6).

The Association of perioperative Registered Nurses (AORN) states in Practice 5 of its recommended practices for sponge, sharp and instrument counts: “sponge, sharp and instrument counts should be documented on the patient’s intraoperative record” (AORN, 2005, p311). American legal opinion focuses exclusively on the negligence of the event of a retained item and not on the necessity to conduct a surgical count, or who

PERIOPERATIVE PRACTICE- COUNTS

Perioperative Nurses College of NZNO. (2005). Recommended standards, guidelines and position statements for safe practice in the perioperative setting. (3rd ed.). Wellington, NZ: Author. Section 5/2, p1-6.

COUNTS

Purpose: Due to the potential for accidental retention of items in a surgical wound, safeguards must be in place to prevent this occurrence, which is the responsibility of the Perioperative Nurse.

THE SURGICAL COUNT

Purpose: Counting items used during surgery should prevent accidental retention of items in a surgical wound. Counts are performed to provide a safeguard and protect the patient and surgical team. The correct surgical count process is the responsibility of the registered Perioperative Nurse.

RECOMMEND PRACTICE 1

All operating theatre suites must have a written policy, protocols and guidelines defining the requirements for instrument, swab, sharp, and disposable items counted during surgical procedures.

Criteria: Policy and procedures should include the following:

- Written, dated, readily accessible and regularly reviewed.
- Identified items which are counted.
- Methods of counting.
- Documentation during the procedure and the
- Documentation in the patient’s health record.
- Measures taken when the surgical count is incorrect.
- Operations/procedures which may be exempt from the surgical count policy.

RECOMMENDED PRACTICE 2

Perioperative Nurses shall be educated in the healthcare

facility policy, protocols and guidelines and the Perioperative Nurses College’s Guidelines to Safe Practice.

Rationale Orientation programmes include tuition in the theory and practice of count policy and procedures. Discussions of loss incidents are included in educational sessions.

RECOMMENDED PRACTICE 3

Perioperative Nurses shall be accountable for their roles and responsibilities for the surgical count.

Rationale: The accuracy of the surgical count is the responsibility of the Perioperative Nurse. The Perioperative Nurse shall ensure that two nurses perform the surgical count, one of whom must be a registered nurse.

RECOMMENDED PRACTICE 4

Perioperative Nurses shall comply with the recommended procedure for safe counting technique when performing surgical counts to meet the Perioperative Nurses College guidelines and the individual healthcare facility policy.

Rationale: Compliance with this recommended practice will minimise the risk of retained items within a surgical wound.

RECOMMENDED READING

- ACORN Board. (2002). Counting of accountable items used during surgery: Standards, Guidelines and Policy Statements Australian College of Operating Room Nurses Ltd, Australia, reference: A3 pl-6.
- AORN (2005). Recommended practices for Perioperative Nursing: Counts-Sponge, Sharp and instrument, Standards and Recommended Practices & Guidelines, Association of periOperative Registered Nurses Inc., Denver, Colorado, p307-312.
- ORNAC. (2003). Surgical count, Recommended standards, guidelines, and position statements for perioperative registered nursing practice, Operating Room Nurses Association of Canada, Canada, module 3, p 18-25.

REFERENCE

- Perioperative Nurses College of the New Zealand Nurses Organisation. (2005). Recommended standards, guidelines, and position statements for safe practice in the perioperative setting. Wellington, New Zealand: Author. Section 5:2-4.

DOCUMENTATION OF PERIOPERATIVE CARE

PURPOSE

To provide guidelines in the documentation of nursing care for surgical and invasive procedures. Comprehensive documentation is essential for evidence that Perioperative Nursing practice is undertaken for optimum patient outcome.

RECOMMENDED PRACTICE 1

The patient's health record should reflect assessment, planning, intervention and evaluation of perioperative nursing care.

Rationale:

Documentation should reflect use of a comprehensive physical, spiritual and psychological assessment in diagnosing and planning care. These planned interventions include patient expectations of outcomes and goals which are individual, prioritised measurable, realistic and achievable.

RECOMMENDED PRACTICE 2

The patient's health record should be specific in the nursing care given, when, where and by whom. This should apply to the immediate preoperative, intraoperative and post-anaesthetic nursing care.

Rationale:

Documented nursing care provides opportunity for providing continuity and continuous evaluation of perioperative care and patient's responses to the care. Professional and legal requirements of patient care are met with comprehensive documentation and collaborative interaction.

RECOMMENDED PRACTICE 3

All records are completed accurately, legibly, objectively, named, dated and signed with designation.

Rationale:

A legal requirement of patient care is accurate documentation of care and events. This is achieved by the patient health record being completed promptly after decisions or events occurring. Information given to patients or relatives is recorded with the name of persons involved.

Accuracy of records includes use of black or blue pen, all boxes or spaces marked and no missed lines. Mistakes crossed out with single line, initialled, dated and noted as a mistake. This ensures that no information can be added later.

RECOMMENDED PRACTICE 4

Policies and procedures of Documentation of Perioperative Care should be developed, available to nurses and reviewed – biannually.

Rationale:

Operating Room Suites have differing documentation

methods within the Organisation's Policy.

Recommended documentation of Perioperative Care should include the following:

- Patient identification and verification of surgery and site.
- Evidence of pre-operative assessment including psychological and comprehensive physical aspects of skin integrity, prostheses.
- Patient positioning and devices used.
- Diathermy return electrode placement.
- Temperature regularity apparatus.
- Monitoring devices e.g. catheterisation type, size and amount water in balloon.
- Blood or blood products and other infusions.
- Specimens and cultures taken.
- Tourniquet placement, pressure and protection
- Implants or medical devices used with any lot or serial numbers.
- Wound drainage system/packing - types, size, including pacing leads.
- Surgical skin-prep. used.
- Any local anaesthetic administered during intra operatively.
- Other medication given intra operatively e.g. pain relief and antibiotics.
- Type of solution of fluid use in washout.
- Radioactive implants with time, number, location and type.
- Count procedure of sharps, instrumentation and swabs.
- Any swabs retained for retrieval at a later date.
- Radiographic screening.
- Laser use with personnel involved, laser type, wattage, and time of usage.
- Wound classification.
- Patient apgar post-operatively.
- Patient discharge condition and details.
- Any significant or unusual occurrence pertaining to perioperative patient outcomes.

RECOMMENDED READING

ACORN Board, (2002). Perioperative documentation: Standards, Guidelines and Policy Statements Australian College of Operating Room Nurses Ltd, Australia, reference: A16 p1-4.

AORN. (2005). Recommended Practices for documentation of perioperative nursing care, Standards and Recommended Practices & Guidelines, Association of periOperative Registered Nurses Inc, Denver, Colorado, p321-324

Local hospital policies and guidelines

ORNAC. (2003). Documentation Recommended standards, guidelines, and position statements for perioperative registered nursing practice, Operating Room Nurses Association of Canada, Canada, module 3, p39-43

REFERENCE

Perioperative Nurses College of the New Zealand Nurses Organisation (2005). Recommended standards, guidelines, and position statements for safe practice in the perioperative setting. Wellington, New Zealand: Author. Section 2, p4-6.

should be responsible (Unknown, 2006). This also applies in New Zealand. If a complaint is investigated by the HOC and a nurse is found in breach of the Patient Code of Rights, the matter may be referred to the NCNZ.

HOSPITAL POLICIES

Policies from selected perioperative units throughout New Zealand were obtained for this literature review. Seven policies were reviewed including the HBDHB (1999), Bay of Plenty District Health Board (2002), Manuka Street Trust Hospital (2004), MercyAscot Hospital (1999), MidCentral District Health Board (2006), Royston Hospital Ltd (2006) and Southland District Health Board (2004).

The focus of the review of policies was to determine how the surgical count was being documented. All the policies varied significantly in format and content. However, the outcome demonstrated that the hospitals surveyed have three different methods of documenting the count.

The methods were:

- 1, Recording the count on a count board and transcribing the count to a count form in the patient's record.
- 2, Recording the count on the count form in the patient's record only.
- 3, Recording the count on the count board and summarising the outcome onto the intra-operative record in the patient's record. This is managed electronically in some hospitals.

One hospital's policy of having the surgeon also signing the count record was seen by the author as putting a greater responsibility on the surgeon to make sure the count was correct. This literature review reinforces the fact that hospitals in New Zealand are in a position to develop autonomous policies.

ERRORS IN COUNTS

Events over the years have made clinicians evaluate their practice and when necessary change their policies and practice.

In New Zealand, the Health & Disability Commissioner (HDC) investigates patients' complaints and reports on the findings. Case 99HDC12195 (HDC, 2001) was published in a comprehensive report detailing the outcome, the liability and the recommendations following the retention of two swabs in a patient.

The case involved an elective cervical spine fusion. This was carried out commencing at 17:15 hours. The surgery was performed in a different theatre to the one where orthopaedic surgery was usually carried out. The scrub nurse practiced in a dual role as scrub nurse and assistant. Both nurses had already worked for eight hours. Two incisions were made, one on the iliac crest, to obtain bone for grafting, and one in the neck. The two nurses undertook a count at the time of skin closure on the neck wound. Due to having to be involved in transferring the patient at the end of the surgery, the count at the time of skin closure did not occur. However, the nurses notified the surgeon that the count was correct and both nurses signed the documentation that the count was correct. Two gauze swabs were retained in the iliac crest wound.

The determination that the swabs had been retained in the iliac crest wound was made by x-ray, approximately three weeks after the surgery, when the patient was complaining of pain and a discharge from that wound. Subsequently the patient had to return to hospital to have the swabs removed.

In the report on the case, the policy of the Hospital and

Health Services stated that the "count sheet is a legal document and therefore all recordings must be legible and in ink. Any crossed out errors need to be initialled, and that the count is documented on the Swab Count Sheet as soon as it is done and transferred to the Count Board in theatre" (HDC, 2001, p 27). Also stated is that "the count sheet is a legal and legible document indicating the count process and personnel involved. This count sheet is completed after the final count. Any discrepancy, and notification to the surgeon, is added if a satisfactory outcome is not achieved. The sheet needs to be signed by the scrub and circulating nurses and that the sheet is secured into the patient's notes" (HDC, 2001, p 28).

Following this investigation the two nurses were found in breach of Rights 4(1) and 4(2) of the patients' Code of Rights: The Right to Services of an Appropriate Standard. They were requested to apologise to the patient and her parents and to review their practice in light of the report.

The review of this case demonstrated yet another method used by a hospital of documenting the count, that of documenting in the patient's record and then onto the count board.

It would be reassuring if there had been no further complaints of items being left in patients in New Zealand since the Health and Disability Report Commissioner's report. But this is not the case. According to personal communication with Field (September 25, 2005), a research analyst with the New Zealand Accident Compensation Commission (ACC), there have been three claims accepted of retained swabs or sponges between 2002 and 2004 in New Zealand. The ACC becomes involved in investigating these events as patients often require further surgery to remove the items.

ERROR REPORTING

Lipponen, Tossavainen, Turunen, & Smith (2005) undertook a study which determined that there is a need to recognise that errors cannot be eradicated but they should be prevented by systematically learning from them. This research brought about a change to practice in Finland to introduce an 'error reporting system'.

In the USA, the prevalence of items being left in surgical patients is at least one in 1500 of intra-abdominal procedures. This corresponds to one or more patients having intra-abdominal surgery per year for a typical large hospital in America (Porteous 2004).

Perioperative Nurses have a professional duty to demonstrate a continuity of nursing care for the patient, something they are unable to do if an opportunity exists for them not to document such care. The count sheet is evidence that a count of swabs, sponges and needles has been carried out. Case studies and past disciplinary proceedings have demonstrated a number of situations can influence the count being correct. Some of the important elements to be considered are emergency, obesity, unexpected change in procedure and staff fatigue, multiple handovers, multiple surgeons, and no documented plan of care (Cunningham, 1998; Porteous, 2004; HDC, 2001; Unknown, 2006).

STANDARDS OF PRACTICE

The 'Normalisation of Deviance' theory as described by King (2006) intrigued the writer. This theory has individuals or teams accepting lower standards of performance until the lower standard become the norm. Complacency sets in and the thought that 'nothing has happened so far' occurs.

King (2006) recommends managing what is controllable, such as systems issues, distractions, competing tasks, too many items to count, the timing of the count and ensuring compliance. How often do we actively review how many 'unnecessary' instruments are in a set? We all know how many patient care activities are required to be undertaken at the commencement and conclusion of a procedure. Could these activities be managed differently? Distractions too could be minimized and/or nurses could be guided on how to manage these. A raised hand is often enough to indicate that a distraction is unwanted.

U.S. CASES

There was limited research data available relating specifically

to the surgical count. Research of all perioperative incidents, involving six hospital sites in the USA, was undertaken by Chappy from January 2003 for 40 months. It identified that incorrect count errors made up the highest percentage (25%) of patient incidents during their perioperative experience. Of the 214 incorrect counts, 22 patients were not x-rayed. The reason for not x-raying the other patients was that the surgeon "knew the object was not in the wound, declined an x-ray or that a visual inspection of the wound did not reveal the object" (Chappy, 2006). In one incident it was reported "that the patient had a terminal cancer and the item will be retrieved anyway" (Chappy, 2006, p 879). One would have expected the nurses to challenge the surgeon rather than have

An example of a recommended procedure for 'Counting of instruments and swabs during a surgical procedure

- All count items are counted by two nurses, one of whom must be a registered nurse. Where possible, the same two nurses should carry out the entire count procedure, when not possible standard handover procedures and documentation should be established. These pre-operative counts are carried out by the scrub nurse and the circulating nurse. The count must be carried out aloud so that there is no misunderstanding by either nurse.
- The nurses must agree on the extent of the items counted, generally if unable to agree, and then the greatest numbers of items should be counted.
- The facility policy should define the order of the count, so that a routine is established amongst all nursing staff.
- Where possible the 'count' should not be interrupted.
- Each item must be completely separated when being counted and particular care must be taken with sponges and swabs in this respect.
- All items that are used on the sterile field should incorporate a x-ray detectable marker, the presence of this is checked during the initial count.
- As each item is counted, it is recorded on the swab count sheet or board (depending upon facilities) (in standard unit 5 or 10 where applicable) in bold figures and once the initial count is complete, both nurses check the recorded sheet.
- Any bundles or packages opened that are not of the standard number are recounted and recorded.
- Any items added to the operative field must be supplied and counted in by two nurses.
- Personnel should not be changed during a procedure with the exception of sickness or extremely long procedures, e.g. Microscopic reconstructions. On such occasions a three-way hand over count should be undertaken whenever possible.
- The scrub nurse must make sure that the circulating

nurse can see each item that is counted.

- At closure of each potential cavity, all counted items are counted e.g. bladder, prior to femoral cementing, peritoneal closure, skin closure.
- The surgeon is then informed that the count is correct or otherwise and acknowledgement is received from the surgeon.
- The count status is documented in the patient recorded, as prescribed by the facility policy.
- At the completion of the procedure, residual packs and drains are documented in the patient's notes as prescribed by the facility policy.
- Documentation regarding the 'Count' is signed by all nurses that contributed to the count, in the patients notes.

Recommended procedure for incorrect count:

All facilities should have a policy and procedure to establish the actions taken in the event of an incorrect count

- At any stage during an operative procedure a count discrepancy occurs, the surgeon must be informed.
- The closure of the wound is interrupted and close inspection of the operative field, instrument tables, and the wider confines of the room is carried out. All footwear and the outer clothing of the scrub team come under scrutiny.
- If searching is unsuccessful, the senior nurse on duty should be informed.
- If the surgeon deems necessary, an x-ray should be taken while the patient is still on the operating table to establish if the item is in the wound ensuring a hard copy of the x-ray kept and documented in patient's record.
- If at the end, the item is still not found the incident is reported on the Incident Form to the most senior nurse and medical officer/administrator of the hospital. ■

to document this event.

In an article by Pirie (2006), the author responds to a letter by a nurse from Ireland that “the need for a permanent record of all countable items used in a perioperative case is required”, as documented in the National Association of Theatre Nurses, Standards and Recommendations for Safe Perioperative Practice (2004). Pirie further states “that this practice is recognized internationally.”

NON-COUNTING PRACTICES

The use of technology is increasing in Perioperative Nursing and may be utilised to exclude the process of counting, which is subject to human error, within the near future. Until technology improves, the patient is disadvantaged by exposure to radiation and the routine post-operative use of x-rays may not provide a conclusive outcome. Of major concern is that the x-raying of patients in theatre using an Image Intensifier may not in fact identify the location of the missing swab (Gibbs & Auerbach, 2001). The Gibbs & Auerbach (2001) study identified that three out of 29 intra-operative x-rays, using the Image Intensifier, produced a false negative result.

The development of a wand to scan the patients prior to closure of the skin, to exclude items being retained, is an interesting new development being trialed (Osterweil, 2006). This could be an alternative to manually counting items used. The wand was described by the surgeon who trialed it as too large and there was concern it would provide a false reading if the wand was used to scan too far away from the wound.

CONCLUSION

In conclusion, it has been determined from the evidence that the current HBDHB policy complies with the Perioperative Nurses College Standards and Guidelines for Safe Practice. It has also been demonstrated that in three of the seven hospital policies reviewed, the nurses documented the count on the count board and also in the patient's record, as is practiced at the HBDHB. Evidence also demonstrated the legal requirement to avoid the retention of foreign items in

a patient. Because the current practice in the work setting is sound according to the evidence, it is recommended that the Surgical Count continue to be documented on the count board and then be transcribed at the earliest opportunity to the Intra-operative Record in the patient's record. Further research is required to determine the risks of ‘transcribing’ the count.

The policy where the surgeon also signs the count record would put a greater responsibility on the surgeon to make sure the count is correct and could be introduced at the HBDHB. The patients' records will be entirely electronic within 12 months at HBDHB and at that time it will be necessary to manage the documentation of the count using a count board and summarising the result electronically, as is currently practiced in other hospitals in New Zealand.

The value of evidence-based nursing is clearly demonstrated in this literature review as the HBDHB nurses have been able to clarify the issues and understand the rationale for current nursing practice. This mechanism has supported maintaining current practices of writing the surgical count on to the count board, transcribing into the patients' notes, and then it being counter-signed by the scrub nurse at the completion of the procedure.

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NEGATIVE PRESSURE Pulmonary Oedema

By Amber Cox

Introduction

Negative pressure pulmonary oedema (NPPO) is a life threatening and sudden pathophysiological change secondary to an acute airway obstruction (Khan, 2022; Karaman & Ozkaya, 2021; Bhattacharya, 2016). Non-cardiogenic pulmonary oedema (NCPO) and post obstruction pulmonary oedema (POPO) are also commonly used abbreviations.

Airway obstructions leading to NPPO can range from community base sequelae through to iatrogenic causes. This article focuses on the incidence, pathophysiology, signs, symptoms, diagnosis of NPPO in the post anaesthesia care unit (PACU).

Registered nurses working in specialty area of anaesthesia nursing and post anaesthesia care need to have an understanding of this life-threatening respiratory condition.

Peri-anaesthesia nurses have a personal responsibility and professional accountability for their nursing practice and are required to maintain competence by continual learning (ACPAN, 2019). It is imperative that peri-anaesthesia nurses possess an understanding of the pathophysiology and diagnosis to provide patients with expert airway and post-

Abstract: Negative pressure pulmonary oedema (NPPO) is a life-threatening complication that results from an upper airway obstruction. This article focuses on the available literature covering the incidence, causes, pathophysiology and diagnosis. The classical signs and symptoms of hypoxaemia and haemoptysis seen in NPPO are explained with a pathophysiological perspective derived from the available literature.

Keywords: negative pressure pulmonary oedema, NPPO, post obstructive pulmonary oedema, POPO, non-cardiogenic pulmonary oedema, NCPO, peri anaesthesia nursing care, haemoptysis, hypoxaemia, post-anaesthetic recovery care unit

anaesthesia nursing care.

Incidence

Meagre formal studies on the incidence and prevalence of NPPO exist in the literature. Guru et al., (2018) declare NPPO is under diagnosed, yet relatively common occurrence in clinical practice.

The first longitudinal clinical research study over 8.5 years examining the frequency and related risk factors for NPPO during emergence from anaesthesia

was performed by Tsai et al., (2018) and calculates the incidence as 0.019 per cent.

A six-month audit of airway incidents across Australia and New Zealand by Endlich et al., (2020) found that the incidence of airway complications could be under reported, with lower severity events not reported at all and a fear of punitive actions due to critical events occurring influencing reporting behaviour.

Causes

During anaesthesia, NPPO may be caused by soft tissue airway obstruction, laryngospasm and episodes of biting on an artificial airway at emergence causing upper airway

Patient populations with high prevalence of NPPO include young muscular males in which physical strength and larger lung volumes are capable of generating large negative intrathoracic negative pressures.

obstructions. The incidence of NPPO following an episode of laryngospasm has been documented as is as high as three per cent (Bhattacharya, 2016). Perianaesthesia nurses should also be aware that NPPO can be found in the community resulting from drowning, choking, strangulation, near hanging and poorly managed or undiagnosed obstructive sleep apnoea syndrome (Watanabe et al., 2020; Sureka et al., 2015).

Patient populations with high prevalence of NPPO include young muscular males in which physical strength and larger lung volumes are capable of generating large negative intrathoracic negative pressures.

Signs and symptoms

The onset of NPPO can be immediate, within minutes, or, in a small number of cases, delayed by several hours (Han et al., 2018; Chang, 2019; Bhaskar & Fraser, 2011). Respiratory distress, agitation, hypoxaemia and haemoptysis are common signs and symptoms of NPPO observed in the post anaesthesia setting. To understand why these occur, nurses need an understanding of the pathophysiology of NPPO.

Pathophysiology

A brief review of normal respiratory physiology is essential in order to understand the pathophysiology changes that occur in NPPO. Upon inspiration, the diaphragm and intercostal muscles contract, moving downward and outward respectively, increasing intrathoracic space and creating a vacuum that pulls air into the lungs (List, 2023). Air then passes into the alveolar network where oxygen quickly and easily diffuses across the capillary membranes into the pulmonary circulation. At the same time, carbon dioxide is transported across its own pressure gradient from the pulmonary circulation into the alveoli where it is removed from the body via passive expiration.

Alveoli stay open throughout this process despite pressure changes and opposing forces in the pulmonary system or transmural pressure, due to the presence of surfactant lowering surface tension in the alveolus that would normally collapse (West, 2012). Starling's law of the capillaries explains the hydrostatic and oncotic pressures at play that supports normal fluid movement from the capillaries into the interstitium (Bhattacharya, 2016 p. 929).

The primary function of the pulmonary lymphatic system is to remove excess fluid that accumulates in the wall of the alveoli (transmural). During episodes of NPPO it is suggested that the normal lymphatic drainage is no longer able to cope with the increase in interstitial fluid accumulation (Bhaskar & Fraser, 2011).

Normal pulmonary ventilation is carefully controlled by the respiratory centres in the pons and medulla (List, 2023). However, during anaesthesia and intubation, patients have their respiratory control overridden by neuromuscular blocking agents and mechanical

ventilation. Pulmonary function returns during emergence from anaesthesia. This is a critical time where secretions in the airways can cause laryngospasm or the patient can bite down on an endotracheal tube and obstruct their airway (Endlich et al., 2020).

Patients emerging from anaesthesia with an obstructed airway still have the normal physiological drivers of respiration at play as determined by the autonomic nervous system (Bittner et al., 2022). Stretch receptors, mechanoreceptors and chemoreceptors continue to drive the diaphragm and intercostal muscles to contract generating considerable negative pressure against the obstructed airway (Chen and Zhang, 2019). A "see-saw" or paradoxical pattern of breathing can become evident as the diaphragm contracts raising the abdomen while the negative intrathoracic pressure pulls the suprasternal area as the patient breaths against the obstruction.

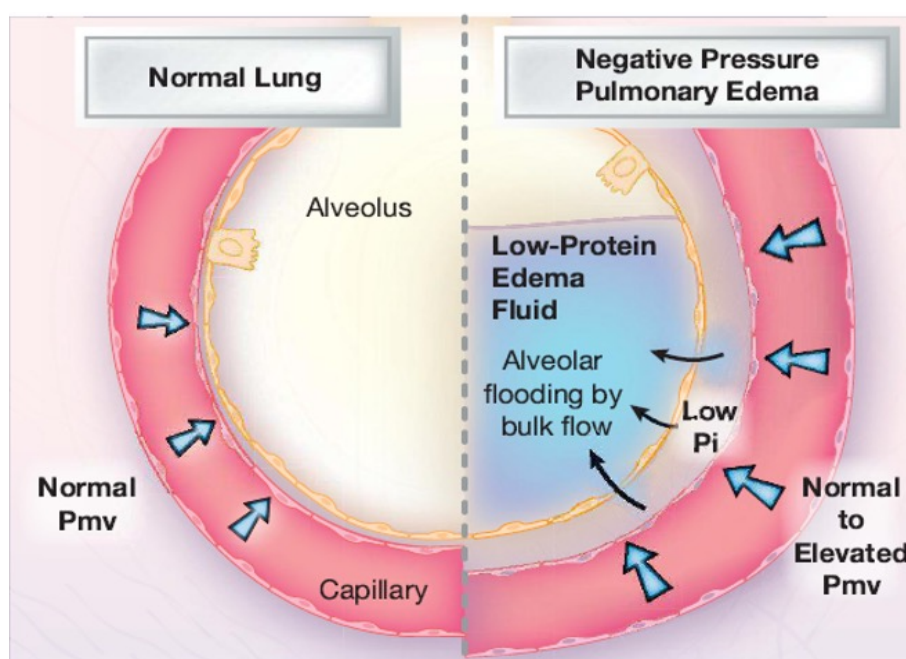


Figure 1: Comparison of the alveolocapillary unit resulting from NPPO. (Bhattacharya et al, 2016 p. 931).

It is imperative that peri-anaesthesia nurses possess an understanding of the pathophysiology and diagnosis to provide patients with expert airway and post-anaesthesia nursing care.

An obstructed airway can be easily identified by suprasternal and intercostal tissue retractions (Bittner et al., 2022). As the negative pressure pulls against soft tissues, there is no passage for air, resulting in a type 1 respiratory failure. Inadequate gas exchange worsens hypoxaemia (Prasad & O'Neil, 2021) and a corresponding deterioration in pulse oximetry results.

During NPPO, negative intra-alveolar pressures are generated due to upper airway obstruction (Silva et al., 2019). Starling forces (responsible for hydrostatic equilibrium between the capillary wall and alveoli) become deranged. This results in low interstitial pressures (McConkey, 2000; Silva et al., 2019; Bhattacharya et al., 2016). As seen in figure 1, fluid is pulled out of the alveolar capillary bed into the interstitial space of the lung parenchyma (Silva et al., 2019; Kloesel & Horvath, 2023). The pulmonary interstitial oedema surrounding the alveoli then transudates into the alveoli. Capillary membranes that participate in oxygen transport are no longer able to function (West and Luks, 2017) and hypoxaemia occurs as fluid occupies the alveoli.

Signs and symptoms

Hypoxaemia in NPPO results from alteration to alveolar ventilation and the diffusion of oxygen across the alveolar–capillary membrane (List, 2022). With an obstructed upper airway, no oxygenated air can be transported to the alveoli, further exacerbating the hypoxaemia. Pulmonary oedema disrupts the ventilation/perfusion ratio resulting in severe hypoxaemia (Silva et al., 2019). The partial pressure of arterial oxygen begins to drop, once below 60mmHg a corresponding drop in the oxygen saturation below 92 per cent will be seen (West & Luks, 2017). If oxygenation is not restored, a continued and dramatic desaturation occurs, which if left untreated will result in cardiac arrest and death (Han et al., 2018; Guru et al., 2018).

Haemoptysis, defined as the coughing up of bloody secretions or blood (List, 2023), is another pathophysiological sign that can develop as the alveoli fill with fluid. It is important to note that during NPPO, haemoptysis is only observable after airway patency is re-established (Khan, 2022), either via the patient spontaneously breathing or re-intubation occurs. Pink frothy sputum is only visible in cases of moderate to severe NPPO (Han et al., 2018).

The pathophysiological changes in the pulmonary and cardiovascular system leading to haemoptysis are caused by increased pulmonary hydrostatic pressures that causes the movement of fluid into the alveoli. Trauma to the endothelial lining caused by negative intrathoracic pressures tinge alveolar secretions pink. The acidosis occurring during hypoxaemia is also suggested to contribute to endothelial damage (Guru et al., 2018).

The protective airway reflex of coughing occurs secondary to the presence of fluid in the lungs. Review of documented case studies of NPPO in the literature revealed a generous but not uncommon number of intravenous fluids during anaesthesia. As with cardiogenic pulmonary oedema, this would be an exacerbating factor for interstitial fluid shifts and haemoptysis.

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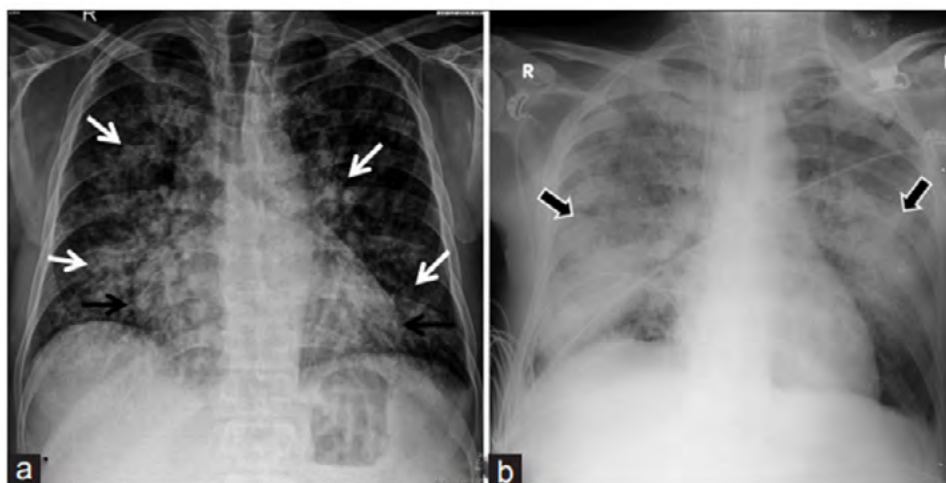


Figure 2: Comparison CXR in cardiogenic and NPPO (Sureka et al., 2015, p. 290).
 (a) Chest radiograph of a case of cardiogenic pulmonary oedema showing cardiomegaly (black arrow) with fluffy air-space opacities in central as well as peripheral lungs (b) Chest radiograph of a case of non-cardiogenic pulmonary oedema showing batwing opacities (arrowheads) with air bronchogram and absence of cardiomegaly.

Diagnosis

Diagnosis is based on rapid patient history including precipitating events and clinical assessment (Han et al., 2018). Diagnostic tests to confirm NPPO include radiographic chest imaging (CXR), bedside chest ultrasound and chest computer tomography (CT), however these tests should not delay rapid life preserving treatment of continuous positive pressure ventilation or high flow nasal oxygen. Portable CXR is a frequent radiological procedure conducted throughout hospitals for detection, diagnosis and evaluating pulmonary and cardiac function (Leeuwen & Bladh, 2019; Pagana & Pagana, 2018), while bedside chest ultrasound requires a skilled operator and may not be available in smaller private centres or rural hospitals.

Conclusion

NPPO is a real and life-threatening complication. This condition occurs as a direct result of an obstructed airway

that has not been identified and relieved in a timely manner. A number of pathophysiological changes occur due to altered pulmonary dynamics. Hypoxaemia and haemoptysis are two classical signs of NPPO.

NPPO incidence and prevalence is difficult to establish with no predictive test to identify high risk individuals. NPPO is most commonly seen in young fit males undergoing anaesthesia requiring airway instrumentation. The literature consists of a number of case studies written in journals and a lack of longitudinal and comprehensive studies and audits of anaesthetic events. This could warrant further investigation and follow up from a major study in New Zealand

looking at both tertiary and regional hospitals.

Overall, early identification of actual cases and an awareness of complications following laryngospasm and other causes of upper airway obstruction will allow nurses working in PACU to identify and manage this condition with an overall improvement in patient safety.

About the author:

Amber Cox is a former Perioperative Nurse Educator working at Health New Zealand Wairarapa where she has spent the last 14 years working in the Professional Development Unit and in clinical roles in theatre. She has more than 25 years' experience working in the perianaesthesia nursing specialty in Australia, UK and New Zealand. Currently Amber is undertaking her Masters in Nursing with Massey University, she is a board member representing New Zealand on the Australasian College of Perianaesthesia Nurses (ACPAN) and enjoying working in casual clinical roles in NZ and Australia.

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EXPLORING Electrosurgical Smoke Control Practices

Among NZ Operating Theatre Personnel: A Qualitative Study

By Assunta Rodrigues (MHPrac- Nsg (Distinction), PGR Cert Periop Specialty Nsg, RN)
Supervisor: Dr. Rhona Winnington (PhD, MA, BA (Hons), BSc (Hons), RN)

Background

Electrosurgical smoke is compared to unfiltered cigarette smoke containing toxic compounds that are harmful to operating theatre patients and personnel. Inconsistent electrosurgical smoke evacuation is a concern among operating theatre personnel due to a growing body of evidence on the hazardous nature of electrosurgical smoke. There is a paucity of research on electrosurgical smoke control practices among diverse operating theatre personnel such as nurses, surgeons, anaesthetists, and anaesthesia technicians.

Keywords: electrosurgical smoke, surgical smoke/plume, smoke evacuation, diathermy smoke and compliance

Aims

To explore and develop a greater understanding of the operating theatre personnel's attitude towards electrosurgical smoke, and how it influences their electrosurgical smoke control practices. To mitigate the risks of electrosurgical smoke on patients and personnel, thereby promoting a smoke-free operating theatre environment at a large tertiary hospital in New Zealand.

Methods

This study was guided by an exploratory-descriptive qualitative methodological framework (Hunter et al., 2019). A purposeful sample of six diverse operating theatre personnel, comprised of two nurses, two surgeons, an anaesthetist, and an anaesthesia technician were voluntarily recruited utilising a gatekeeper.

The researcher conducted individual virtual interviews, that were transcribed verbatim, and analysed utilising the six-phase reflexive thematic analysis approach (Braun & Clarke, 2021).

Findings

Findings revealed that electrosurgical smoke is a controllable occupational hazard in the operating theatre. Although electrosurgical smoke evacuation is routine in open surgical procedures, it is poorly upheld in laparoscopies.

The study highlights inconsistent electrosurgical smoke evacuation in the operating theatre with an inherent risk of exposure to hazardous electrosurgical smoke.



Three major themes emerged:

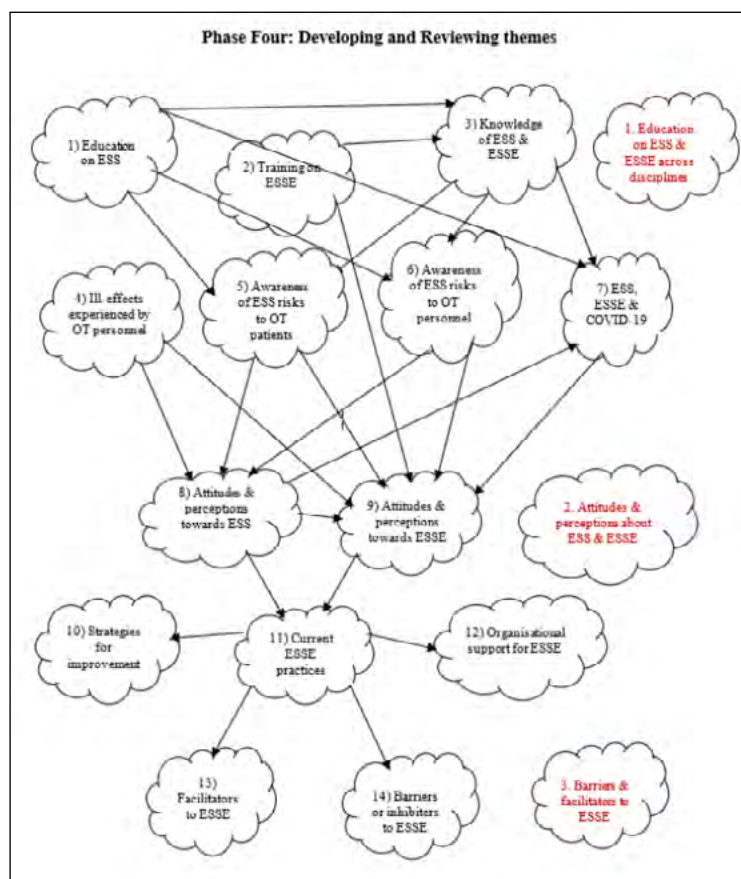
- Education on electrosurgical smoke and electrosurgical smoke evacuation across disciplines
- Attitudes and perceptions about electrosurgical smoke and electrosurgical smoke evacuation
- Barriers and facilitators to electrosurgical smoke evacuation.

Significance

The findings contribute to the body of knowledge and understanding about the complex issue of compliance with electrosurgical smoke evacuation. Study findings provided the basis for significant recommendations to mitigate operating theatre patients and personnel's risks of exposure to hazardous electrosurgical smoke.

Recommendations

- Education about electrosurgical smoke and its evacuation across disciplines;
- Electrosurgical smoke evacuation policy update;
- Display posters to raise awareness on the risks of electrosurgical smoke;
- Ensure the availability of appropriate electrosurgical smoke evacuation equipment and supplies in collaboration



- with surgeons, charge nurses, and company representatives to streamline inventory;
- Update surgeon's preference card;
- An electronic prompt for intra-operative documentation of electrosurgical smoke evacuation;
- Annual audit of effective electrosurgical smoke evacuation and feedback;
- Garner management support to recognise electrosurgical smoke as an occupational hazard;
- Disseminate research findings through conference presentation & publication;
- Future research should delve deeper into electrosurgical smoke control practice across diverse hospital settings with a larger sample size for comparative analysis.

Conclusion

Education of operating theatre personnel across disciplines on electrosurgical smoke and its evacuation with strong leadership support is the key to influencing positive attitudes toward electrosurgical smoke evacuation. This knowledge is vital to overcome barriers for effective and consistent compliance with electrosurgical smoke evacuation, thus promoting a healthy electrosurgical smoke-free operating theatre environment for patients and personnel.

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50 YEARS OF 'The Dissector'

The following article is derived from the current Dissector journal Chief Editor Bron Taylor's presentation at the Perioperative Nurses College (PNC) of the New Zealand Nurses Organisation (NZNO) conference held in Wellington in October, 2024. Bron would like to acknowledge Karen Hall and Michael Esdaile for providing the additional historical content for this article.

Origins

The founding members of the National Operating Theatre Nurses group decided to venture into the world of publishing, by presenting a nursing journal designed to meet the needs of operating room (OR) nurses. They proposed a balance of clinical content with other issues specific to the specialty. It was mailed, free of charge, to all who had attended the 1973 Seminar in Wellington and to OR Supervisors in every hospital, public and private throughout the country.

Founding Editor Pam Marley recalled that she volunteered to "have a go" at being the editor of *The Dissector* and the offer was accepted. Two issues were released in 1975, but only one in 1976 as Pam Marley was abroad. In 1977 two

issues were published, then in 1978 the National Committee announced plans to move toward publishing four issues a year in February, May, August and November. Pam Marley spent a total of eight years at the helm, in two separate periods.

In 1980, under Barbara Jolly's tenure, a colour theme was chosen for the cover of each edition: Blue (February), Orange (May), Red (August) and Green (November). Margaret Cullen took over the editorship in 1983 and served in the role until 1986. That year it was decided that each Region should appoint a representative to be responsible for supplying articles for publication. This was seen as a way to generate material and to maintain a continuity of copy for the journal. At this stage, all copies had a green cover with a Macdonald



*Clockwise from left:
Jean Koorey brought the
journal back from hibernation
in 1998.*

*After two years working with
Jean, Sue Claridge took the
helm from 2000 to 2003.
Kathryn Fraser took over the
helm at a difficult time and got
the journal onto an even keel.
Irene Minchin brought youthful
enthusiasm and a focus on
using modern technology to
the production of the journal.*



Dissector lying diagonally across it.

The journal continued, under a variety of Editors and Editorial Committees until 1997 when those charged with producing *The Dissector* stumbled and the journal went into hibernation for 18 months. Aware that the journal had ceased publication, Brett Edmonds, then Managing Director at Advantage Publishing, approached the National Committee with a proposal that would see Advantage Publishing take over journal production and the mail-out to the members.

Advantage Publishing

Jean Koorey, the Chair of the now Perioperative Nurses Association (PNA), responded to this approach in March 1998 and by early September a contract was in place. This saw Advantage Publishing assume responsibility for all commercial aspects of the journal. The re-launched journal, October 1998 featured a complete re-design of the look and content of the Journal of the Perioperative Nurses Special Interest Group. Jean had stepped down as Chair of the PNA and devoted her considerable energy and determination to getting *The Dissector* onto a firm footing before handing over to Sue McIntosh following publication of the October 2000 issue.

Looking back on this period, Michael Esdaile, then the Copy Editor, now our Publisher, reflects that “without a doubt it was Jean Koorey’s steely resolve and no-nonsense approach that brought *The Dissector* back to life. Advantage had the publishing experience but without articles, it would have been rather hard to put a journal together.” He adds that he doubts many members of the College have any inkling of how much work the editors down through the years have put

in to providing a professional journal, one that is the envy of many other branches of New Zealand nursing professions, and indeed of nursing journals of international publishers.

“The College will be forever indebted to them,” he says, adding. “Pam Marley is an inspiration. She didn’t know anything about printing or publishing when she decided to “have a go” and she pulled it off. Clearly, she had some people helping out but how many College members today would even think about doing what she and her peers did? Every time I think about that, I think about the pioneering spirit that brought all this about — the journal and the College — and I hope that is something we never forget.”

Catherine Logan, one of the early driving forces for professional recognition for perioperative nurses, served the shortest term as Editor. She took over from Fiona King following publication of the August 2005 issue and despite being diagnosed with cancer and undergoing chemotherapy, she soldiered on to produce the November 2005 as well as the February and May 2006 issues. Catherine died in office on July 19, 2006. Her legacy was in bringing a very strong focus of articles that were evidence-based and supported, creating the human face to perioperative nurses. Catherine was also instrumental in suggesting *The Dissector* journal topics and authors needed to be indexed, as this had not been done since its inception in 1974.

Following Catherine’s death, National Committee invited Kathryn Fraser to step up to the role and, despite having been a member on the Editorial Committee for less than 12 months, she took on the challenge. As Chief Editor of *The Dissector*, Kathryn served for an unbroken period of seven years and



Shona Matthews (left) provided a total of 16 years' service to the journal, six of those at the helm. This makes her the longest serving member of The Dissector team. Bron Taylor (right) has proved a hard-working, diligent journal editor, hampered by the COVID-19 lockdowns, Editorial Committee 'churn' and a shortfall in advertising that has caused delays in publishing. Through it all she has maintained an amazing degree of calmness.

was responsible for overseeing the publication of 25 editions of the journal. Kathryn brought a new rigor to editing 'copy' — the term used in publishing circles for articles. Also under Kathryn's time as Editor, the Incentive to Publish scheme was initiated. This saw PNC members paid for articles they had written that were published in the journal; Advantage Publishing matching the College contribution.

Editing processes

In the period from Jean Koorey's editorship to that of Kathryn Fraser, there was a slow evolution in the way copy was supplied. Initially it was sent to the editor, who mailed the copy to the Editorial Committee before posting some notations to the publisher. The articles were sometimes hand-written, but most were typed. They were then re-typed into a computer. Advantage Publishing's appointed editor would then undertake a final edit, before posting copies of each article to each member of the Editorial Committee, with notes and questions. The Editorial Committee members would then carry out their own edits then post or transmit the copy by facsimile machine back to Advantage Publishing. By the time Kathryn was in the editor's chair, many articles were coming in on floppy-discs (remember them?), copied direct into a computer, edited then mailed to the Editorial Committee members to make changes and corrections. It was only toward the end of Kathryn's editorship in 2012 that all members of the editorial committee had home computers so the articles could be emailed.

In 2014 Advantage Publishing established a space in Dropbox where the Editorial Committee could access articles on-line to edit the material. The current Editorial Committee still use this process.

On-line databases & libraries

In 2011, under Kathryn Fraser's stewardship, the journal's international reputation was recognised by Gale, part of Cengage Learning of Belmont, California, USA. The PNC signed a licensing agreement to make *The Dissector* available via the Gale databases: Academic Onefile and Expanded

Academic Index. This makes the journal accessible to all NZNO Members and went on-line in March 2011.

In March 2012, EBSCO Publishing of Ipswich, Massachusetts, USA signed a three-year licensing agreement with the PNC to make *The Dissector* available via the CINAHL Complete on-line database.

Another licensing agreement with the College was signed in September 2013 with ProQuest of Ann Arbor, Michigan, USA. This makes *The Dissector* available on-line in yet another online database: the British Nursing Index with full text.

During Kathryn's time as Editor, she worked with NZNO to arrange the binding and indexing of the first 30 years of *The Dissector*, a process she began in November 2006. It was completed by the end of 2007, when NZNO reported that "the first 100 issues (Vol. 1, No. 1 September 1974 – Vol. 33, No. 4 February 2006) were indexed. A complete set was bound into volumes for archival purposes and as a reference set for researchers. These volumes are held by the NZNO library."

The plan was that every five years, the journal would be indexed and the copies bound, an initiative approved by the National Committee in 2011. Whilst the indexing has been delayed by the lack of a suitable indexer, the NZNO library now holds bound copies 1974 to 2018.

Moving on

Following Kathryn Fraser, Irene Minchin took over the reins of the journal in 2012 and developed her own unique style of garnering copy (articles) for publication. Irene had already spent six years (with a two-year break in the middle) on the Editorial Committee so had a good grasp of the role.

The youngest journal editor, Irene had a lot of energy that she was able to channel into editorship, running the journal smoothly until Shona Matthews took over in 2015.

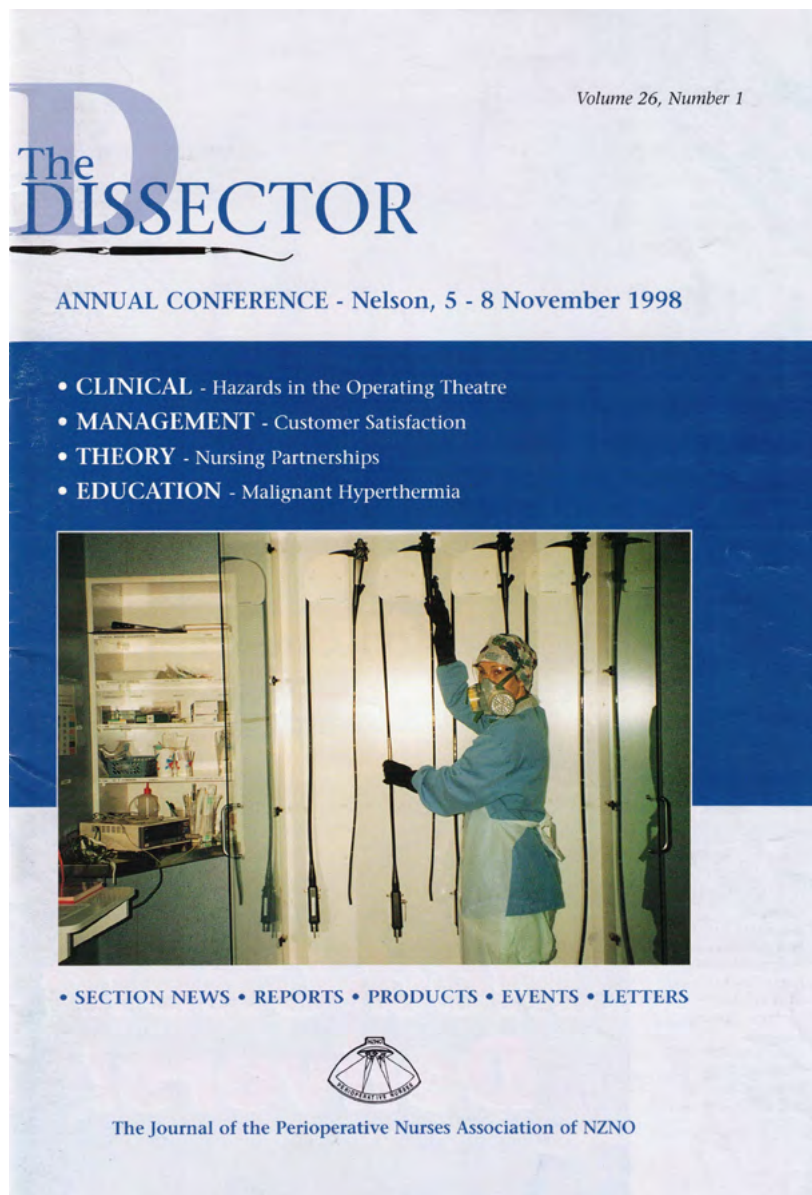
Shona had already spent five years on the Editorial Committee by the time she took the helm and proved another great asset to the College. Shona had a wonderful collegial approach, encouraging members to write for their journal at every opportunity.

Editorial Committee members remember with great fondness their face-to-face meetings in her Auckland homes, the freshly-made morning muffins and the great coffee. All delivered with grace and charm.

By the time Shona stepped down from the editorship in 2020, she had sent ten years with *The Dissector*, then agreed to remain on the Editorial Committee for another three years to assist Bron Taylor who had just a year to grasp the role.

Bron has had the most difficult time of all recent editors with the government lockdowns around COVID-19 throwing a spoke in the wheels of face-to-face meetings, not to mention the abandonment of the 2020 and 2021 PNC Conferences for the same reason. The PNC Conferences are historically a great opportunity to network and track down potential authors from the various conference presenters.

In addition, the amalgamation of many past journal advertisers with bigger companies unwilling to invest in perioperative nursing through the journal led to the reluctant



After 18 months' hibernation, The Dissector came back with a bold new look for the October 1998 issue, the first produced by Advantage Publishing.

decision to end the print edition in favour of a digital emailed publication.

There has also been more 'churn' among editorial committee members in Bron's term, adding another difficulty in getting the job done.

Having Shona Matthews agree to stay on during the early years of her editorship has been invaluable, as has been the support from Catherine Freebairn and Rebecca Porton-Whitworth.

Bron has been in the role for four years and soon the College will be faced with having to find a worthy successor to continue the journal into the next 50 years.

Acknowledgements

We would like to acknowledge the dedication, time and commitment of our previous Editors and Committee members, without whom The Dissector would not have continued to be the much-loved success it is.

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Chief Editors

Pam Marley: 1974 – 1979,
Barbara Jolly: 1979 -1983
Margaret Cullen: 1983 - 1986
Elaine Martin: 1987 - 1989
Pam Marley: 1989 - 1991
Sheila Street: 1991 - 1992
Margaret Gick: 1992 - 1996
Suzette Norris: 1996 - 1997
Jean Koorey: 1998 - 2000
Sue Claridge: 2000 - 2003
Fiona King: 2004 - 2005
Catherine Logan: 2005 - 2006
Kathryn Fraser: 2006 - 2012
Irene Minchin: 2012 - 2015
Shona Matthews: 2015 - 2020
Bron Taylor: 2021 -

Editorial Committee Members

Bettina Marenzi: 1998 - 2001 & 2009 - 2011
Fiona King: 1998 - 2004 & 2005 - 2006
Sue Claridge: 1998 - 2000
Isabel Jamieson: 2000 - 2003
Karen Hall: 2000 - 2006
Catherine Logan: 2001 - 2005
Irene Minchin: 2004 - 2009 & 2011 - 2012
Kathryn Fraser: 2005 - 2006
Joanna Cornwall: 2006 - 2012
Helen Vaughan: 2006 - 2009
Sue Morgan: 2006 - 2011
Lisa Thomas-Czepanski: 2009 - 2011
Fiona Unac: 2009 - 2010
Shona Matthews: 2010 - 2015 & 2021- 2024
Rob McHawk: 2011 - 2015
Johanna McCamish: 2012 - 2017
Jennifer Sexton: 2012 - 2017
Sandra Millis: 2013 - 2018
Feng Shih: 2015 - 2019
Tracey Lee: 2015 - 2019
Sarah Winship: 2018 - 2020
Catherine Freebairn: 2018 - 2024
Devika Cook: 2018 - 2022
Rebecca Porton-Whitworth: 2018 - current
Bron Taylor: 2019 - 2020
Olivia Bradshaw: 2022 - 2024
Eby Eapen Mathew: 2022 - 2023
Finau Faka' Ī: 2024 - current
Sue Clynes: 2024 - current
Amber Cox: 2024 - current



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