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Care for children and adolescents with diabetes in New Zealand District Health Boards: Is the clinical resourcing ready for the challenge?

Craig Jefferies, Neil Owens, Esko Wiltshire for the Clinical Network for Children with Diabetes in New Zealand, on behalf of the Paediatric Society of New Zealand diabetes clinical network

Type 1 diabetes (or insulin requiring diabetes) affects approximately 1,500 children and adolescents in New Zealand. It has defined treatment goals of diabetes management that require a group of paediatric doctors, nurses and allied health workers who are specialised in diabetes to provide this care. If care is inadequate, then children's health is affected (poor diabetes control, increased complications) and long-term this group will have increase health needs and increased complications. This survey compared current staffing in District Health Boards for diabetes in New Zealand to established international standards and in particular found that the majority of clinical services providing care for children with diabetes in New Zealand are significantly under-resourced. This may have significant impact on short and long term health of children and young people with diabetes in New Zealand.

The case for a systematic policy approach to free primary health care for vulnerable groups in New Zealand

Lik Loh, Siobhan Trevallyan, Steve Main, Leo Revell, Vivienne Patton, Akindele Ojo

Unmet health care needs and health inequities are prevalent in New Zealand. Throughout New Zealand's history, the power dynamic between general practitioners, as a professional group, and the government has contributed to policies directed at primary-care access barriers not being fully realised. This has given 'third sector' (non-government, non-profit) clinics a continuing role in delivering primary care services to vulnerable populations. The viability of free clinics, 18 of which were identified in our survey, is threatened by their funding and staffing structures. We contend that general practitioners have a stake in reducing health inequities and that there is a strong case for a more systematic policy approach to primary health care provision for vulnerable populations in New Zealand.

Care versus convenience: Examining paracetamol overdose in New Zealand and harm reduction strategies through sale and supply

Nadia Freeman, Paul Quigley

Statistics on overdoses at Wellington Hospital Emergency Department from 2007-12, found that paracetamol is the most common form of drug poisoning. Examination for potential harm to the liver, is required if a minimum of 10 g of paracetamol is taken within eight hours. For this reason the United Kingdom has limited the sale of paracetamol to 8 g per sale (approximately 16 tablets). In New Zealand, some stores have a limit of 10 g per packet (approximately 20 tablets). But, pharmacies do not have to limit the amount sold in each packet, and there is also no limit on the amount of packets that can be purchased. This is of particular concern when considering online pharmacies, where there are few procedures in place to ensure customer safety.
Differences in acute general surgical admissions between obese or overweight patients compared to normal-sized patients

Richard Flint

Obesity is recognised as causing a plethora of health conditions but until now it has been uncertain what effect it has on acute surgical disease. This study shows that the effect is great with over 20% of patients presenting to an acute surgical department being overweight. These patients are at a younger age and are more likely to need an operation than patients of normal size.
Bullying in Surgery
Catherine Ferguson

“To bully is to threaten, oppress or tease, either physically or morally, and can include: public humiliation, persistent criticism, personal insult, professionally undermining a person’s professional ability, consistently undervaluing effort and abuse of power. Bullying is not necessarily face-to-face; it may be by written communication, e-mail or telephone.”

This statement is taken from the Royal Australasian College of Surgeons (RACS) handbook on Bullying and Harassment, which was published in 2014. Workplace NZ defines bullying as “repeated and unreasonable behavior directed towards a worker or a group of workers that creates a risk to health and safety.”

The recent work commissioned by RACS, and reinforced by New Zealand surveys of both resident doctors and medical students, has bought the issue of bullying in medicine into sharp focus over the past few months. However, this is by no means a recent phenomenon, and indeed The New Zealand Medical Journal and the NZMJ Digest have published on workplace bullying in 2004 and 2008. A quick review of the international literature cites bullying in surgery all over the world, with recognition of the issues extending back to at least the 1990s. In the past, this has been termed as ‘uncivil behavior’ and ‘disruptive behavior’, but it is time to accept that this is, quite simply, bullying.

The RACS Expert Advisory Group (EAG) review found that not only was bullying prevalent in surgery, but also that it is an ongoing problem, experienced at all levels in surgery, and that the consequences are far reaching. As well as surveying fellows, trainees and international medical graduates, personal stories were collected and online discussion forums provided a vehicle for honest exchanges and some very thoughtful comments. Some of the information shared was deeply disturbing and distressing, and those who responded are to be commended for their bravery in sharing their stories.

Many respondents talked about the concept of bullying as a ‘rite of passage’ and a mechanism to ‘toughen-up’ young surgeons for the life ahead. Indeed, some RACS trainees surveyed acknowledged that bullying occurs, but see it as an inevitable part of surgical training. However, most survey respondents reported that far from ‘building resilience’ for the stressful life of a surgeon, bullying behavior has resulted in depression, feelings of inadequacy, suicidal ideation and exiting from surgery altogether. Many young doctors have decided against pursuing a career in surgery because of the behaviors they have witnessed.

It is well recognised that bullying in the workplace leads to poor performance, anxiety and absenteeism. It creates a poor learning environment, where trainees suffer from a lack in confidence and insecurity in their clinical skills. Pfifferling reported in 1999 that bullying results in withholding information for fear of being bullied or criticised, not asking for help, withholding suggestions, reduction in self-esteem, increased staff turnover, blaming others and dysfunctional teams.

For decades, medical training—and surgery in particular—has adopted the apprenticeship model of teaching, and this has been successful in producing surgeons with high levels of medical knowledge and technical expertise. However, not only do our young surgeons learn their surgical
EDITORIAL

Craft, but also they learn that bullying and disruptive behavior are condoned—even valued and accepted—as ‘normal’. It is a sad fact that many of us have become desensitised to poor behavior, to the extent that it is no longer recognised as wrong. Perpetrators are not taken to task for their actions, and colleagues and employers stand by and watch. It is little wonder that we see these poor behaviors being repeated from generation to generation of our surgeons.

Medical expertise and technical expertise are only two of the nine RACS competencies, which also include; professionalism and ethics, communication, collaboration and teamwork, advocacy as well as judgment, clinical decision making, scholarship and teaching, and management and leadership. Until now, traditional surgical teaching has not focused on these areas, particularly because most of us are not equipped to teach these skills. The focus must now shift to the effective teaching of these skills, and providing today's teachers with the means to achieve this. This requires both individual and workplace recognition of the value in teaching these skills, and ensuring that there is provision in the workplace for training educators. In addition, trainers and trainees alike need to be educated how to provide effective and constructive feedback, and the difference between feedback on poor performance and bullying.

Bullying and harassment are patient safety issues. Doctors who are subjected to bullying and harassment in the workplace are not performing well and patients are therefore placed at risk. Bullying may result in dysfunctional clinical teams that fail to communicate effectively. Trainees may be afraid to speak up when they have concerns over patient safety because of the bullying culture within their unit.8,9

Many publications have discussed the culture of bullying that exists in the health sector, and the difficulties seen in trying to change that culture. What is plain is that change cannot occur in a vacuum. There are a multitude of policies and manuals gathering dust on the shelves of every organisation and institution, but policies alone—without effective mechanisms to monitor and manage performance issues—cannot effect change. Failure to modify bullying behavior should be the subject of disciplinary action without fear of recrimination, and both professional bodies and employers should be prepared to take appropriate steps towards all health professionals when this occurs.

The EAG has challenged RACS to take a stand against bullying and harassment, by fostering cultural change and leadership, and improving education, as well as improving our complaints mechanisms. RACS is committed to answering this call, but as a profession we must all take up this challenge and work together with our colleagues across the whole of the health sector—from Medical School to Colleges, to DHBs, jurisdictions and beyond—so that the work that has begun will bring about the cultural change that is so urgently required.

Lieutenant General David Morrison led a review of bullying and harassment in the Australian Army. He is famous for the powerful statement, “The standard you walk past is the standard you accept”. It is time for us all to heed that message and act upon it.

“Every patient has a right to expect that their healthcare is uncompromised by discrimination, bullying and sexual harassment in the practice of surgery. Every surgical trainee has a right to an education free of discrimination, bullying and sexual harassment.

And every healthcare worker—including every surgeon—has a right to a workplace free of discrimination, bullying and sexual harassment.”10
EDITORIAL

Competing interests:
Dr. Ferguson reports she is a surgeon and was a member of the RACS Expert Advisory
Group looking at discrimination, bullying and sexual harassment. She is the chair of the
Professional Standards Committee of RACS and a College Councillor.

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**EDITORIAL**

**Bullying in health care settings: time for a whole-of-system response**

Peter Crampton, Tim Wilkinson, Lynley Anderson, Sue Walthert, Hamish Wilson

Sadly, there is nothing new in reports of bullying in medical training and in health care settings. Reports and surveys over the years confirm as much, and many currently practising health care professionals will be able to relate their own experiences of bullying or harassment.\(^1\) Two recent events have once again brought this issue to the nation’s attention. The first event was triggered this year by an Australian doctor who revealed her experiences of sexual harassment within surgical training. The second event was the recent release of survey results on medical students’ experiences of bullying. Both events are shocking. Shocking because they reflect an underlying reality that no-one is denying, and shocking because hospitals and other organisations involved in the delivery of health care have cultures that allow and sustain bullying and harassment.

Excuses can be made. The terms bullying and harassment are sometimes used loosely and not all behaviour that is labelled as such would really fit commonly used definitions. For example, an off-hand, one-off comment in a stressed situation can be interpreted by the recipient in a variety of ways. Hospitals and other health care settings are often highly pressured work environments with multiple staffing and financial stresses piling on top of inherently demanding and risky work. To survive in such environments, students and staff need to be tough and resilient, don’t they? But excuses are just that. The underlying reality is that bullying and harassment contribute to negative working, learning and healing environments and are absolutely and categorically not acceptable.

We believe there may be a risk of a ‘cycle of violence’ as is seen in child-abuse. Many doctors teach in ways that they were taught: “a bit of ritual humiliation didn’t do me any harm”. The response should always be to support the ‘victim’, but we should not necessarily rush to condemn the ‘perpetrator’—the behaviour is unacceptable, but the instigator may also need understanding and support. The mildest-mannered, well-intentioned person can act in regrettable ways when they are placed in stressful, unsupported environments.

We do not propose that we can achieve a utopian world where there are no disruptive or negative behaviours.\(^2\) We do propose, however, that wide ranging system-level responses will improve the learning and working environment. How can universities, professional organisations, hospitals, general practices and other health care organisations contribute?

**An honest appraisal of the problem of bullying and harassment**

These longstanding problems need to be named and confronted. We commend the Royal Australasian College of Surgeons for owning and responding to these issues within surgical training, as it seeks to understand and address the underlying factors.\(^3\)
EDITORIAL

Encourage positive learning environments in health care settings

The literature confirms that bullying also occurs in other professions, such as nursing. Bullying between professions also occurs. A multidisciplinary approach is needed that welcomes and supports student learning, encourages students to participate in clinical activities, and provides regular, constructive feedback. The University of Otago is currently initiating research into the creation of positive learning environments in health care settings.

Resilience and resistance training for staff and students

The quality of medical training contributes to students’ future professional identity as a doctor. To nurture resilience, health professional programmes need to encourage personal and professional development through small group work, reflective practice and mentoring.

There is considerable evidence that negative role modelling by senior staff is harmful to students. Training of all health professional students should aim to provide students with knowledge about complex work places and human behaviour, provide strategies to use when they feel bullied or harassed, and encourage individual and bystander resistance. Both Otago and Auckland Medical Schools are exploring options for specific coaching to help equip students to respond to challenging interpersonal situations. Students are also trained how to provide support for peers and to work together within a team.

Encourage students to use the existing support mechanisms in universities and health care settings

At Otago Medical School, analysis of students’ reflective writing shows that students recognise when they are affected by difficult interpersonal interactions. Mostly, they seek support appropriately through available channels: teachers and mentors, Associate Deans, staff/student committees, and student representatives. They also have opportunities to provide feedback via routine teaching evaluations.

Reporting mechanisms for staff and students

We cannot deal with a problem if we don’t know it’s happening. We cannot detect patterns if we do not collect information. We therefore need robust ways to track unacceptable behaviours. One major problem is victims may not feel safe to report such behaviours. They fear ‘word will get around’, they won’t be offered jobs, won’t be offered training positions, and will be regarded as difficult. Some even use the term ‘career suicide’. There is clearly a power imbalance: the victims feel powerless, the perpetrators are seen as powerful. This imbalance needs correcting. Having independent advocates is an option, and these are already in place in universities and most workplaces.

Anonymous reporting might seem attractive, but there are pitfalls in this approach. Anonymous reports cannot be verified or queried and can be vindictive; also natural justice suggests the accused should have an opportunity to respond.

On the other hand, anonymous reporting may provide data for monitoring purposes. Several anonymous complaints about the same clinician may well indicate a pattern and can be used as a basis for confidential, respectful and timely feedback to colleagues; for example: “no attempt has been made to verify this information, but you should know that several students have anonymously reported feeling humiliated by your comments during ward rounds”.

Confidential reporting that is not anonymous may be preferable. Complaints are made to an independent authority who protects the complainant’s confidentiality. The process needs not only to be safe for the victim, but also to be seen to be safe.

Another option is to collect routine data on all staff. Many medical schools, including
Otago, now routinely collect data from staff on students’ professional behaviours. Some medical schools, for example McGill University in Montreal, ask students to comment on staff professional behaviours.\(^7\) Increasingly, reaccreditation procedures require practising doctors to collect information from co-workers on their professional behaviours—often through tools such as multisource feedback.

### Top-down initiatives

Responsibility for the ethos of institutional and teaching environments for medical students is shared between District Health Boards and the two medical schools in New Zealand. While these institutions already have zero-tolerance policies, the current publicity about harassment and bullying may be an opportunity for a fresh approach to the working environment for students and junior staff. Initiatives could include workshops on teaching skills, anti-bullying campaigns led by well-respected senior staff, independent reporting and investigation systems, employing staff on the basis of teamwork and collegiality as well as on academic achievements, and staff training on sexual harassment, bullying and cultural sensitivity.

### Conclusion

The problem of bullying and harassment in health care settings demands proactive, whole-of-system initiatives. Single, simple solutions will not be sufficient. Health care professionals should role model ‘caring’ in their interactions with colleagues and students—everyone will benefit.

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**Competing interests:** Nil

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Bullying culture: Valuing the teacher-student relationship

Elizabeth Berryman

The New Zealand Medical Students’ Association (NZMSA) is calling on all clinical teachers and students to take a new approach to teacher-student relationships in the light of medical students reporting high levels of bullying when on clinical placements. The NZMSA 2015 survey found that 54% of students reported being bullied. Other New Zealand and international studies have shown similar results.1-3 Such high levels have been received with disbelief by some of the medical profession, and some have doubted whether what was being captured was indeed bullying.4 This indicates the need to clearly define what is appropriate behaviour, and what is not.5 NZMSA believes that if both parties place a higher value on the teacher-student relationship, a bullying culture could not exist.

The NZMSA survey

In August this year, the NZMSA conducted a nationwide survey of fourth, fifth and sixth year medical students studying in New Zealand. The survey found that 54% of students had experienced what they perceived as bullying when on clinical placements and 76% had witnessed another student being bullied. The 772 responses were from a pool of 1,536 NZMSA clinical students. The survey allowed students to anecdotally share their experiences of bullying if they wished. Many of these experiences were significant, with teachers blatantly crossing professional boundaries and breaching codes of ethics and workplace health and safety policies.4,6,7 However, students commonly reported more subtle forms of bullying, such as isolation, rudeness, inappropriate humour, humiliation and intimidation, which holds the same negative outcomes.1,6

Students’ experiences

The results show that a large proportion of students are encountering what they perceive as bullying, and we know that this behaviour has negative impacts on students learning and wellbeing.3,7 It tells us that we are not creating a safe environment for students, we are not fostering positive teacher-student relationships, and we are not placing a high value on the teacher-student relationship, even though it is one of the main factors known to contribute to ‘good learning’.9,10

The statistics capture the extent of the problem, but the stories shared by the students illustrate it better. Here are a few of them.

Racism

A staff member refuses to learn the names of his Asian students, despite the students wearing name badges and having names that are easy to pronounce. Instead, he refers to them as “Bob” or “Bill”, regardless of whether they are male or female. Three students from different years told this story:

“He would refer to me in third person in theatre...such as saying, 'It's Bill's fault—she keeps making mistakes.'”

“It made me feel annoyed and that I was in some way inferior to the other student I was paired with (a European male) whom the consultant addressed by his proper name and didn’t make jokes about. I knew I had to take it because that was the price of passing.”

“If you don’t pull hard enough [assisting in theatre], I’ll send you back to Hong Kong.”
EDITORIAL

Sexual harassment
“The registrar said a few of the team were going for drinks after work on Friday and he asked if I would like to join them. I agreed, but when I got to the bar it was just him. I asked where the others were and he said they had all pulled out last minute. He then proceeded to buy me an alcoholic drink and pressured me to have more. I kept making excuses to leave but was told, ‘I will tell the consultant you haven’t been good on this clinical run if you don’t have another drink with me.’ I made an escape, but the rest of the run he would make inappropriate sexual jokes out of earshot of others and say things like, ‘You won’t get very far in a career in medicine if you don’t know how to have a bit of ‘fun.’”

Intimidation
“I was grilled by consultants constantly from day one; on ward rounds, in clinic, in front of patients and other staff. I was questioned intensely and embarrassed by not being able to verbalise the answer adequately. The style of questioning was not friendly and sounded like an interrogation. I can remember one ward round vividly: one of my discharged patients from a few weeks ago came in overnight and I was told to present him to everyone on the team at the patient’s bedside during ward round. I did not have his notes on me and I couldn’t remember much about him. I tried presenting but I fumbled and couldn’t quite get it right. The consultant then started interrogating me about the condition that the patient had come in with, firing question after question; eventually I just had a blank. I stood there for what seemed like several minutes not doing anything. The worst thing was when the consultant said, ‘this patient must not have made a big impression on you then?’ My heart sank. I felt as though whatever shred of confidence I had left was destroyed and I felt like I let down the patient. The embarrassment in front of the entire team and the patient made me want to leave and cry. I went to the patient after and apologised. He said not to worry, but he seemed quite concerned about the events that occurred.”

Differing expectations
We all agree that we should not tolerate blatant bullying of the kind exemplified in the racism and sexual harassment examples above. However, what about the more commonly reported perceived bullying of isolation, rudeness, inappropriate humour, humiliation and the kind of intimidation described by the last student? Do we all agree that these kinds of behaviours are no longer acceptable in the clinical learning environment? We believe that the survey results indicate that students and teachers have differing expectations of what is acceptable. This produces an uneasy tension between teachers and students, and erodes the teacher-student relationship. If this difference is not dealt with, it will continue.

Valuing the teacher-student relationship
Of course, many factors affect the teacher-student relationship, including wider system pressures, and we cannot possibly cover them all in this article, but we acknowledge the impact these. The apprenticeship model of clinical medical education means that the relationship between the teacher and the student is pivotal, so we will focus on this. It is personal interaction that determines the quality of a relationship, and like all good relationships we need to dedicate time and effort into developing it and value its importance to see improvement. We will focus on three key things we can do right now to place value on the teacher-student relationship.

Firstly, we should acknowledge that each relationship is unique. Every teacher and every student is different, and each relationship requires a different set of skills. Educating both students and teachers in how to deal with these differences is important. Currently, there is very little
training provided for clinical teaching staff, and students are not taught how to be an effective clinical student. We have workshops for ‘dealing with difficult patients’, but we have nothing for dealing with ‘difficult team dynamics’.

Secondly, as with the doctor-patient relationship, there is a clear power difference between teacher and student. The hierarchical structure of the system increases the power disparities. Compounding the issue is what the literature describes as the ‘hidden curriculum’, in which teachers unconsciously try to teach students about ‘real-life medical culture’. An article by Haidet & Stein states that sometimes this hidden curriculum includes premises such as a:

“demand for ‘right’ answers (avoidance of uncertainty); intimidation, public shaming, and humiliation (doctors must be perfect); the treatment of students as objects to be ‘filled up’ with knowledge and facts (outcome is more important than process); unhealthy competition (medicine takes priority over everything else), and deference to experts, regardless of their teaching abilities (hierarchy is necessary) p. S17.”

Teachers must acknowledge this power difference and this unconscious hidden curriculum, and try to reduce its impact so that accurate and constructive feedback, both teacher-to-student and student-to-teacher, can be given.

Simple things, like learning students’ names, giving student’s opportunities to ask questions, saying ‘Good Morning’ directly to students or acknowledging them with a smile around the hospital, are a start.

Some teachers are already adapting these kinds of practices:

Allowing feedback from students:

“I had some trepidations going into my final attachment for the year in light of the recent NZMSA showcase on bullying, however two days into the attachment our surgeon said the following to me and my classmate: ‘I know that my style of teaching can be quite abrupt and blunt and

I will push you both hard. I've found this to be an effective way for students to learn. However if this is too much, or if you think that it crosses a line, then I want you both to feel comfortable in letting me know that and I will adjust my approach accordingly.’ The doctor then went on to ask if we were happy to continue with this style of teaching and we both agreed that we were, but that we would like another opportunity to give feedback midway through the attachment.”

Developing the relationship

“She [doctor] greeted us with a warm welcome and big smile on our first day. She took us on a tour of the ward and introduced us to all the staff and made sure they knew who we were. We then went to a small room and she asked us questions about what schools we went to, what we did before medicine, and what we wanted to learn from this placement. She told us a bit about herself, her hobbies and her children. It felt like a safe place to discuss what we needed to do on the placement and to ask questions. This took 30 minutes. During the attachment she was quite strict and sometimes asked us difficult questions on the spot, but it was okay ‘cos we knew her and that she wasn’t going to think we were idiots for getting it wrong.”

Thirdly, students must take responsibility for their own learning. If we don’t understand something, or we don’t like something a teacher is doing, we have to raise it with the teacher. We must show our teachers that we recognise it is an enormous privilege to be involved in clinical practice, and that we appreciate the generosity of the many teachers who go above and beyond to help us to learn, despite many other pressures, but that we must take initiative ourselves to make the most of learning opportunities. We must also learn to ask what is expected of us in each new relationship and how to give constructive feedback to our teachers about how we individually learn.
Conclusion

The blatant bullying needs to stop, that we all agree on. But the survey results show that less obvious behaviour is having just as much negative impact on students, and it is because of differing expectations. Teachers and students need to agree on what is acceptable behaviour in the teacher-student relationship, then work on developing it. A medical taskforce workgroup has been set up to form recommendations for change, but it starts now with each and every interaction we have. We need all parties to discuss openly and honestly with each other how we can do things better.

A new approach is needed to the teacher-student relationship. We call on all teachers and students to value and respect the relationship as much as we do the patient-doctor relationship. We cannot change the culture overnight, but with this renewed approach the teacher-student relationship in time can develop into a relationship of trust, communication, improved learning and positive outcomes.

Competing interests: Nil

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EDITORIAL

Workplace bullying in hospitals: an unresolved problem

Steven Kelly

Bullying and harassment is endemic in the health sector. It occurs with all types of staff and across varying levels of seniority. A recent extensive investigation commissioned by the Royal Australasian College of Surgeons has revealed that 49% of fellows, trainees and international medical graduates have been subject to discrimination, bullying or harassment. A small proportion of these reported cases were frankly disturbing and in many cases illegal behaviour by the perpetrator. The problem is occurring across all surgical specialties. The primary source was consultant surgeons. On 8 September, 2015, an expert advisory group reported these above findings to the college. They stated that they were “shocked” by the findings and recommended widespread major changes to eradicate discrimination, harassment and bullying. Given the seriousness of the findings, the college president, Professor David Watters, gave a video apology to all the past victims and promised to eradicate this problem from the college.

It is well known that bullying and discriminating behaviours have been with surgery probably since its inception. There has been a culture treating trainees harshly, as it was believed that only “the strong will survive”, to make good surgeons. From anecdotal reports of surgeon’s behaviours generations ago, it would be fair to say they these individuals probably would not be employable today, as their disruptive behaviours would be immediately brought to the attention of human resources departments. However, society’s moral zeitgeist has evolved and behaviours that were accepted in the past are certainly not acceptable now. Unfortunately, the recent college surveys would indicate surgeons as a group have a long way to go to achieve the objectives that the College of Surgeons have set. Professor David Watters has stated that there is now zero tolerance for discrimination, bullying and sexual harassment in surgery.

Workplace bullying can have profound psychological effects on the victim. Furthermore, bullying decreases the quality of patient care, creates a poor learning environment and increases psychological stress. It is associated with significant loss of productivity and it discourages the best junior doctors from pursuing a career in surgery.

There are two types of people that bully others. Firstly, there are those who selectively pick their victims, who they intend to hurt in order to get pleasure or excitement from using their power. These people are rare, but are present in all organisations. The second group comprises people in whom the accusation of bullying is due to a disagreement over what represents normal social behaviour. The accuser feels bullied by behaviour that the accused believes is reasonable.

The marked hierarchical nature of the medical system is such that consultant surgeons have a large amount of power over trainees and other medical staff. This professional privilege to have so much power and control is respected by most surgeons. However, there are a small number of surgeons who were highlighted in the survey that abused this power and subjected others to unacceptable discrimination, bullying and sexual harassment. Unfortunately, there also existed a code of silence and inaction by peers of the disruptive surgeons, and the behaviour was allowed to continue. Hospital management commonly did not act. They valued the disruptive surgeon’s clinical service rather than the more dispensable service from the junior staff.
The College of Surgeons have accepted all of the recommendations from the expert advisory group to resolve the problem. The College of Surgeons is now standing on the edge of change. To continue as business as usual is not an option. A major cultural change will have to occur amongst all fellows and specialist societies if progress is to be made. There will need to be more transparency, independent scrutiny and external accountability integrated into all levels of change. Surgical education needs to improve. Students learn better when they are supported and feel they are in safe surroundings. The College must foster excellence in teaching. There needs to be independent scrutiny of complaints. Complaints need to be dealt with fairly and without fear of retribution.

The College of Surgeons have promised to fix the problem. However, the largest impediment for change will come from surgeons not willing for such a major cultural change. In fact, some surgeons don’t believe that these issues really exist. To these surgeons, I would advise that they read the personal testimonials that have been given to the college as part of its research.\(^5\) This, I hope will change their mind.

**Competing interests:** Nil

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**URL:**

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Care for children and adolescents with diabetes in New Zealand District Health Boards: Is the clinical resourcing ready for the challenge?

Craig Jefferies, Neil Owens, Esko Wiltshire for the Clinical Network for Children with Diabetes in New Zealand, on behalf of the Paediatric Society of New Zealand diabetes clinical network

ABSTRACT

**AIM:** Landmark studies, including the Diabetes Control and Complications Trial, have demonstrated the need for intensive management and improvement of glycaemic control in children and adolescents with Type 1 Diabetes (T1DM). Our aim was to determine what clinical resources were present in New Zealand to manage diabetes in children and adolescents and compare this with international recommendations, via the Paediatric Society of New Zealand clinical network.

**METHOD:** All 21 District Health Board (DHB) secondary care sites in New Zealand managing children and adolescents with diabetes were invited to complete a survey about the specialist services they provided in 2012.

**RESULTS:** All of the identified 21 sites (encompassing 20 centres) replied. These centres managed 1,587 children and adolescents with diabetes up to 18 years of age (>95% with T1DM), including 251 (16%) on insulin pumps. Average clinic HbA1c was not available for many centres. Staffing for specialists (general paediatricians or paediatric endocrinologists) was low (median 0.2/100 patients, range 0.1–0.4), but was relatively higher in diabetes nurses (median 0.7/100 patients, range 0.1–1.8). Despite the psychological and social burden of diabetes, the two allied health disciplines (psychology services and social worker) were the hardest to quantify as dedicated resource in these disciplines did not exist in all but three centres.

**CONCLUSIONS:** This survey suggests that the majority of clinical services providing care for children with diabetes in New Zealand are significantly under-resourced.

Type 1 Diabetes Mellitus (T1DM) is the most common form of diabetes in childhood and adolescents throughout New Zealand, irrespective of ethnicity and socioeconomic status. T1DM is progressively increasing in incidence worldwide by 3–5%/year, a phenomenon also seen in New Zealand.\(^1\)\(^-\)\(^7\) Although the incidence and prevalence of type 2 diabetes in children and adolescents in New Zealand are also increasing—particularly in Māori and Pacific populations—type 2 diabetes accounts for less than 10% of new onset cases of diabetes in this age range.\(^8\)\(^-\)\(^11\) The effect of this compounding increase on the T1DM population is a doubling of the numbers affected every 15–20 years, without including the additional predicted New Zealand population growth. Although an area of intense research worldwide, T1DM has no foreseeable intervention that will either delay or prevent the onset of disease.\(^5\)

Based on a number of landmark studies, including the Diabetes Control and Complications Trial (DCCT)\(^12\) and the Epidemiology of Diabetes Interventions and Complications
(EDIC)\textsuperscript{13,14} studies, there is good evidence for intensive management and improvement of glycaemic control in children and adolescents with T1DM.\textsuperscript{6,7} These studies, which included intensive management from a multi-disciplinary team coupled with intensive insulin management, have shown short-term (over six months) significant improvement in glycaemic control (mean HbA1c in adolescents in the intervention arm of DCCT 8\% (64 mmol/mol) compared with 9.8\% (84 mmol/mol) in the control arm), followed by significant reduction in long-term microvascular complications.\textsuperscript{12-17} Workforce resourcing is essential for these gains.\textsuperscript{18}

The management of T1DM is also undergoing a revolution of technological improvements in glucose testing and monitoring, insulin delivery (pumps) and shortly closed-loop systems which require additional resourcing.\textsuperscript{18-20} These continued improvements and innovations increase the technical aspects and complexity of T1DM management in both paediatric and adult practice.

The Paediatric Society of New Zealand (PSNZ) formed a national clinical network for paediatric diabetes care in 2012. This network represented clinical teams that manage >95\% of children and adolescents (<16 years of age) with diabetes, predominantly T1DM.\textsuperscript{4} Through this network we aimed to document and quantify the number of specialist clinical staff employed or available to resource children and adolescents with T1DM.

**Methods**

All secondary care centres throughout New Zealand who managed children and adolescents with diabetes were invited in mid-2012 to participate in a national survey of resourcing through multiple sources including: email and written invitation through the lead clinicians; or if not known, the service managers locally; or diabetes nurses or other diabetes team members. The majority of the replies were from the lead clinicians for paediatric diabetes in the DHBs.

All centres were asked to complete a survey to determine the numbers of staff working in paediatric diabetes services (including paediatric endocrinologists, paediatricians, diabetes nurse specialists). Access to dietitians and psychological services was determined, as well as other resources available: insulin pump therapy, continuous glucose monitoring systems (CGMS), and any database used. Visiting specialist clinics were not included, as they were infrequent and few patients with diabetes were seen in them. Information was also collected on the frequency with which patients attended clinic (with any diabetes health professional) and whether the local service knew their patients' or service's average HbA1c for 2012 (ie, whether they could provide the clinic mean HbA1c at the time they completed the survey).

Staffing was expressed as number of full-time equivalents (FTE) per 100 patients where possible. For ease of reporting, dietitians and psychologists are presented as dedicated FTE or not, where dedicated FTE reflects the clinician/allied health member being embedded within the diabetes team. This distinction of dedicated or not was provided from the individual centre. The authors calculated the FTE equivalents and contacted the centres to confirm the number was correct. For some smaller centres, nurse educator time is over-estimated as it includes tenths also used for adult services (as it was impossible to separate specific paediatric time for several smaller centres).

**Results**

Of the 21 clinic sites identified and invited, all completed the questionnaire. The majority of the replies were from the lead clinicians for diabetes in the DHBs. Three DHBs were covered by one centre, whereas three DHBs had multiple clinic sites (for these DHBs questionnaires were sent to each site). Two of these sites were from the same centre in one DHB (providing information on the adolescent and paediatric services separately)—these two were combined as one centre to enable comparison with other DHBs. Thus results are presented for 20 centres, covering >95\% of New Zealand children and adolescents with diabetes, as shown in Table 1. A total of 1,587 children and adolescents were managed by these centres at the time of the survey. Centre size varied, reflecting the
marked range in geographic distribution of the population in New Zealand (Table 2). The four clinics that had over 100 patients each represented >50% of the total group.

As shown in Table 3, there was a wide variation between centres in all aspects of staffing: some centres had dedicated paediatric diabetes teams, though this was only seen in the five main centres. Only 20% of centres, representing >50% of patients, were staffed with paediatric endocrinologists. A further 30% had intermittent access to visiting paediatric endocrinologists. Overall, paediatric staffing (endocrinologists or general paediatricians) was at a median of 0.2/100 patients, range 0.1–0.4 and diabetes nurse staffing was at a median 0.7/100 patients, range 0.1–1.8.

Only four sites had a dietitian embedded in the paediatric diabetes team. In all other centres, the dietitian(s) were mostly employed to advise/manage adult patients and undertook paediatric work as a small part of their work with adults. Only 3 sites had dedicated psychologist(s) as part of the team, though others reported generic access to psychology support through routine child and adolescent mental health services or an alternative specific arrangement. No sites had a social worker or podiatrist in the team.

On average most children were seen 3–4 times per year in clinic by a doctor and/or multidisciplinary team. Around half of the centres (13/21) had access to some sort of database for diabetes in the DHB, but many did not routinely use any system or keep it up to date. Therefore, mean HbA1c/centre was only readily available from 11/20 centres, representing half of all children cared for by centres in the survey. Most sites used point-of-care HbA1c measures, such as DCA 2000 (Bayer).

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**Table 1:** Paediatric centres surveyed by District Health Board (DHB).

<table>
<thead>
<tr>
<th>Centre</th>
<th>DHB</th>
</tr>
</thead>
<tbody>
<tr>
<td>Whangarei</td>
<td>Northland DHB</td>
</tr>
<tr>
<td>Starship Diabetes Service</td>
<td>Auckland DHB</td>
</tr>
<tr>
<td></td>
<td>Counties-Manukau DHB</td>
</tr>
<tr>
<td></td>
<td>Waitemata DHB</td>
</tr>
<tr>
<td>Waikids</td>
<td>Waikato DHB</td>
</tr>
<tr>
<td>Tauranga</td>
<td>BOP DHB</td>
</tr>
<tr>
<td>Rotorua</td>
<td>Lakes DHB</td>
</tr>
<tr>
<td>Gisborne</td>
<td>Tairawhiti DHB</td>
</tr>
<tr>
<td>Napier</td>
<td>Hawkes Bay DHB</td>
</tr>
<tr>
<td>New Plymouth</td>
<td>Taranaki DHB</td>
</tr>
<tr>
<td>Whanganui</td>
<td>Whanganui DHB</td>
</tr>
<tr>
<td>Palmerston North</td>
<td>Midcentral DHB</td>
</tr>
<tr>
<td>Masterton</td>
<td>Wairarapa DHB</td>
</tr>
<tr>
<td>Hutt</td>
<td>Hutt Valley DHB</td>
</tr>
<tr>
<td>Wellington</td>
<td>Capital &amp; Coast DHB</td>
</tr>
<tr>
<td>Nelson* Wairau</td>
<td>Nelson/Marborough DHB</td>
</tr>
<tr>
<td>Greymouth</td>
<td>West Coast DHB</td>
</tr>
<tr>
<td>Christchurch</td>
<td>Canterbury DHB</td>
</tr>
<tr>
<td>Timaru</td>
<td>South Canterbury DHB</td>
</tr>
<tr>
<td>Dunedin Invercargill</td>
<td>Southern DHB</td>
</tr>
</tbody>
</table>

*Survey responses obtained from two sites (paediatric and adolescent), combined for analysis as noted in text

---

**Table 2:** Clinic demographic details, by centre.

<table>
<thead>
<tr>
<th>Centre</th>
<th>No with diabetes</th>
<th>Age Range (years)</th>
<th>Patients on pumps N (%)</th>
<th>CGMS available</th>
<th>Mean HbA1c</th>
<th>Database available</th>
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<td>0–15/18</td>
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<td>N/A</td>
<td>Yes</td>
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<tr>
<td>2</td>
<td>52</td>
<td>0–18</td>
<td>4 (11.7)</td>
<td>Yes</td>
<td>N/A</td>
<td>No</td>
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<tr>
<td>3</td>
<td>160</td>
<td>0–15</td>
<td>14 (8.7)</td>
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<td>75</td>
<td>Yes</td>
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<tr>
<td>4</td>
<td>57</td>
<td>0–21*</td>
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<td>N/A</td>
<td>Yes</td>
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<td>5</td>
<td>14</td>
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<td>N/A</td>
<td>Yes</td>
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<tr>
<td>6</td>
<td>110</td>
<td>0–20</td>
<td>25 (22.7)</td>
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<td>70</td>
<td>Yes</td>
</tr>
<tr>
<td>7</td>
<td>122</td>
<td>0–18</td>
<td>26 (21.3)</td>
<td>Yes</td>
<td>63</td>
<td>Yes</td>
</tr>
<tr>
<td>8</td>
<td>94</td>
<td>0–15</td>
<td>13 (13.8)</td>
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<td>71</td>
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<tr>
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<td>95</td>
<td>0–18</td>
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<td>72</td>
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<td>50</td>
<td>0–16</td>
<td>9 (18.0)</td>
<td>Yes</td>
<td>75</td>
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<tr>
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<td>0–18</td>
<td>6 (24.0)</td>
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<td>No</td>
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<tr>
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<td>73</td>
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<tr>
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<td>90 (20.0)</td>
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<td>69</td>
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<tr>
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<td>82</td>
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</table>

TOTAL 1,587  251 (15.8)  17/21 N/A  13/21

* A small number of patients over 18 seen in adolescent clinic
N/A Not Available
Table 3: Staffing available, by centre.

<table>
<thead>
<tr>
<th>Centre</th>
<th>Number of patients in clinic</th>
<th>Doctors FTE per 100 patients*</th>
<th>Diabetes nurses FTE per 100 patients</th>
<th>Dietitian Dedicated FTE Or Accessible</th>
<th>Psychology services Dedicated FTE Or Accessible</th>
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<tr>
<td>ISPAD recommendation(^{22,23})</td>
<td>0.75</td>
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<tr>
<td>7</td>
<td>122</td>
<td>0.2**</td>
<td>1.0</td>
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<tr>
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<td>0.3</td>
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<tr>
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<td>450</td>
<td>0.4**</td>
<td>0.7</td>
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<td>0.7</td>
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</table>

*Paediatricians, including paediatric endocrinologists.
**Has a paediatric endocrinologist(s).
*** Recommendation includes psychologist and/or social worker
†Nominal means most patients seen in general paediatric outpatient clinics rather than a paediatric diabetes clinic—in these centers specific paediatric diabetes time was impossible to determine, but is limited.

Discussion

This is the first time there has been a survey of the clinical resources available to care for our children and young people with diabetes throughout New Zealand. Most children, in particular in the main centres, do attend a paediatric centre that is staffed by a team with specialised knowledge of diabetes and management in the child or adolescent. Despite this high attendance by patients, all centres were below the international recommendations for medical staff, there was enormous variation in nurse educator numbers and most do not have dedicated psychologists or dieticians. Only around half of centres have access to a dedicated database for measuring outcomes.

The New Zealand Ministry of Health quality standards for diabetes care acknowledge that:

> “Young people with diabetes should have access to an experienced multidisciplinary team including developmental expertise, youth health, health psychology and dietetics” (standard 16) and “All patients with type 1 diabetes should have access to an experienced...
Despite this, resourcing at a DHB level for paediatric diabetes is relatively ad-hoc, with little or no acknowledgement of either the continued rise in numbers of children with T1DM, or the increased resourcing needed for the use of technology.

The International Society for Paediatric and Adolescent Diabetes (ISPAD) recommends a minimum of 0.75 doctors and 1.0 nurse/nurse educators per 100 children with T1DM.\textsuperscript{22,23} Due to marked variation in nursing ratios between centres, the median nursing ratio was not far below this level overall at 0.7 and included four centres above the ISPAD recommendation, and four centres close to it. However, this partly reflects an overestimation of nursing resource for child and adolescent diabetes in smaller centres, where the care of children is a part of diabetes nursing work focussed on adults, which is often not ring-fenced and the ‘tents’ reported for this survey includes a significant amount of work with adults. There was also large variation between regions in nursing staff numbers, highlighting inequality in service provision. The median level of doctors involved in T1DM care, at 0.2/100 patients, is markedly low and of particular concern across the DHBs. Furthermore, it was not possible for centres to accurately state psychology and social work resources, as they are generally very low or non-existent. In comparison to a similar Australian workforce survey, we have fewer doctors, similar nursing ratios and equally low allied health numbers (Australia averages 0.43 doctors per 100 patients, 0.58 diabetes nurses, including educators, 0.19 dietitians, 0.10 psychologists, 0.13 social workers and 0.11 podiatrists).\textsuperscript{24}

Generic psychology input is important in youth with diabetes and their families. It needs to address much more than mental health and emotional well-being,\textsuperscript{15} though these are major issues, and are risk factors for premature death in adulthood with T1DM.\textsuperscript{25} The impact of T1DM is more stressful on families than childhood cancer over the medium to long-term.\textsuperscript{26} Diabetes, in particular diabetic ketoacidosis, impacts on childhood learning and cognition, both acutely (changing with diabetes control) and chronically.\textsuperscript{27,28} Psychology input is essential to enhance positive behavioural change for children and identify barriers that impede such change. Although access to formal psychiatric services for those with severe mental health issues is absolutely vital, it is the day-to-day coping with the chronic stress of diabetes that is the major need for most children and their families with diabetes.\textsuperscript{29,30}

Generic access to allied health expertise is not conducive to a multidisciplinary approach. It does not allow team members to learn from each other, work collaboratively or reinforce consistent messages to the patient and family. Dietetic and psychology services need to be seen as key parts of treatment rather than an optional add-on. Similar logic should be considered for social work and exercise (physiologists or fitness experts) in the future. Exercise is one of the “three pillars of diabetes management”, along with diet and insulin first put forward by Joslin in the 1920s and is supported by RCT’s such as the DCCT.\textsuperscript{6,12}

Considering the well-defined glycaemic goals in T1DM, it is a major concern that many centres do not have a formal up-to-date database to track their patients’, and overall, mean clinic HbA1c. The ISPAD target for HbA1c in children is <7.5% or 59 mmol/mol.\textsuperscript{22,23} It is therefore a major concern that this measure and how many patients are ‘on target’ is not known by some clinics or nationally, and is not a measure that is part of health targets for DHBs. Previous New Zealand audit data in youth <26 years in 2003 has suggested overall sub-optimal glycaemic control, with mean HbA1c 9.1\% (76 mmol/mol), particularly in adolescents and young adults up to age 20.\textsuperscript{11} Up-to-date national data regarding incidence, HbA1c and diabetes complications is required urgently. The PSNZ paediatric diabetes network is currently undertaking an audit and benchmarking of such outcomes in New Zealand, this should be available in 2015 and may also indicate whether there has been any increase in T1DM or type 2 diabetes in those under 16 years. The high response rate (100% of centres) is a strength of this study. However, it is no more than a snapshot in time, in 2012, and a more formal ongoing...
assessment of the diabetes specialist workforce is required, as the situation may have changed since then.

Conclusions

This survey suggests the majority of services providing care for children with T1DM in New Zealand are significantly under resourced. If children and adolescents with T1DM are to achieve intensive management and improved long-term glycaemic control, then adequate resourcing to manage this vulnerable population and accurate outcome measures (HbA1c in particular) are required throughout New Zealand. Future workforce planning is required to manage the expected increase in numbers of children and adolescents diagnosed with diabetes and to support families in achieving optimal glycaemic control. It also needs to take into account the increase in complexity of T1DM, the forecast New Zealand population increase and the increasing prevalence of type 2 diabetes amongst adolescents.

Competing interests: Nil

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ARTICLE

Care versus convenience: Examining paracetamol overdose in New Zealand and harm reduction strategies through sale and supply

Nadia Freeman, Paul Quigley

ABSTRACT

AIM: To examine statistics on paracetamol overdose in New Zealand and investigate options to reduce paracetamol overdose rates, through supply reduction strategies.

METHOD: Data was gathered from the Ministry of Health’s National Minimum Dataset and Wellington Hospital Emergency Department attendances. Twenty articles on supply reduction strategies were sourced through article database searches. A survey on paracetamol availability from online pharmacies within New Zealand was conducted by searching for New Zealand online pharmacies through Google.

RESULTS: A five-year audit of data (2007–2012) from the Wellington Hospital Emergency Department revealed that paracetamol was the most common medication used for overdose (23%). National data on aminophenol derivatives accounted for 22.4% of poisonings in New Zealand’s public hospitals. An online search found that 25 out of 27 online pharmacies sold packets containing 50 grams of paracetamol. However, the literature supported restricting packets to the minimum threshold for an acute exposure (10 g).

CONCLUSION: Paracetamol poisoning is the most common form of drug overdose in many developed countries. Tightening restrictions on the quantity of paracetamol sold per packet, in all outlets in New Zealand, may be an effective strategy to reduce overdose rates. This includes online pharmacies where large quantities of paracetamol per packet are available for sale.

Paracetamol is commonly used throughout the world as an effective form of mild pain relief.\(^1\) It is the first line analgesic recommended for the treatment of minor injury by the Accident Compensation Corporation.\(^2\) However, paracetamol also contributes to considerable financial cost to the health care system through hospital admissions, as paracetamol overdose is now the most common form of drug poisoning in many developed countries.\(^3\) While the demand for paracetamol as an effective pain reliever and anti-pyretic appears appropriate, strategies to reduce supply need to be considered to prevent misuse and overdose.

Methods

A dataset on paracetamol poisoning attendances at Wellington Hospital Emergency Department (ED) was extracted from audit data that had been collated through the Emergency Department Information System (EDIS). Data are captured in EDIS automatically for all patients attending with a primary diagnosis within the ICD10 code range T36 to T50 for drugs, medications and biological substances, and T51 to T65 for toxic effects of substances, chiefly non-medical. This dataset is used to provide information to the New Zealand Ministry of Health (MoH) on the cause of poisonings,
and the age and sex of those poisoned. For this study, a subset of paracetamol overdoses or accidental poisoning was extracted for the period 2007 to 2012. To single out overdoses where paracetamol was the primary agent, a case-based audit of 2013 data was performed on all EDIS T391 codes with recordable paracetamol levels. All statistical analyses were conducted using Microsoft Excel for Mac 2011 14.6.4 (Microsoft Corporation, Redmond, WA, US).

The MoH collects information on discharges from publicly-funded hospitals relating to poisonings across New Zealand for the National Minimum Dataset. For this study, data was obtained from the MoH on the number and associated costs of poisonings from 4-aminophenol derivatives subgroup—aminophenol derivatives are used in the synthesis of paracetamol—using the code T39 (of which paracetamol is the only available medication in New Zealand) and on T36–T50, the poisonings subgroup for drugs, medications and biological substances for 2012.

A search on the quantity of paracetamol per packet available for sale through online pharmacies was conducted on 24 February, 2014. New Zealand-operated online pharmacies were found by using online search engine Google, and the key words ‘New Zealand’ and ‘pharmacy’. Pharmacies that sold products online and were identifiable as New Zealand operated by their web address, physical address or retail name were selected.

Literature on effective strategies to reduce overdose rates was found through article databases Google Scholar, Scopus and general searches of a wide range of databases using the University of Otago library aggregator. Key word combinations of ‘paracetamol’, ‘overdose’, ‘self harm’, ‘suicide’, ‘acetaminophen’, ‘quantity’, ‘restriction’ and ‘supply reduction’ were used for these searches. Articles were selected if they described supply reduction strategies with the aim of reducing paracetamol overdose rates.

### Results

There were 3,259 episodes of medication poisonings recorded in the Wellington Hospital EDIS from 2007 to 2012. Table 1 shows the frequency of agents used or associated with poisonings. The most common agent was paracetamol, used in 23% of all cases. All other medications accounted for between 3 and 9% of overdoses.

In 2013, 172 out of 879 (19.6%) overdose presentations to Wellington Hospital Emergency Department were for primary paracetamol poisoning, with serum positive paracetamol levels above the minimum threshold. Of these, 9.3% had paracetamol levels sufficiently high to require treatment (level >1,000 umol/L). The main cause of paracetamol overdose in 2013 was deliberate self-harm and attempted suicide, accounting for 86.2% of presentations, followed by accidental therapeutic overdose at 8.6% and paediatric accidental ingestions at 5.2%. Of the deliberate overdose presentations, 80% were female with a median age of 20, ranging from 13 years to 76 years old.

Data presented in Figure 1 demonstrates that 50% of cases occurred in patients

### Table 1: The top nine most common medication misused or overdosed in Wellington Hospital Emergency Department presentations 2007–2012

<table>
<thead>
<tr>
<th>Agent</th>
<th>No. of Episodes</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paracetamol</td>
<td>747</td>
<td>23%</td>
</tr>
<tr>
<td>Zopiclone</td>
<td>308</td>
<td>9%</td>
</tr>
<tr>
<td>Quetiapine</td>
<td>237</td>
<td>7%</td>
</tr>
<tr>
<td>Codeine</td>
<td>158</td>
<td>5%</td>
</tr>
<tr>
<td>Ibuprofen</td>
<td>145</td>
<td>5%</td>
</tr>
<tr>
<td>Citalopram</td>
<td>134</td>
<td>4%</td>
</tr>
<tr>
<td>Clonazepam</td>
<td>133</td>
<td>4%</td>
</tr>
<tr>
<td>Fluoxetine</td>
<td>96</td>
<td>3%</td>
</tr>
<tr>
<td>Diazepam</td>
<td>93</td>
<td>3%</td>
</tr>
</tbody>
</table>

Legend: Paracetamol is the only available medication in New Zealand.
under the age of 20 years. This group also had the highest number of cases that tested at levels above the minimum threshold for treatment than any other age group.

In 2012, aminophenol derivatives (ICD10 T39.1) accounted for 22.4% (1,712) of hospitalisations in New Zealand for poisonings related to drugs, medications and biological substances in 7,637.3 These had an average estimated cost of NZD$1,702.71 per hospitalisation.3

The online survey of New Zealand-operated online pharmacies found that 25 of the 27 sold paracetamol packets containing 100 tablets of 500 mg tablets (50 grams). The price of these packets ranged from NZ$9.99 to NZ$20.99. Sales pages were reviewed for each of the online pharmacy retailers; for each retailer, the only information required to complete the paracetamol product sales were payment and delivery details. No retailers required information on the purchaser’s age or medical history in order to complete the purchase.

**Paracetamol supply**

There is a large body of evidence that both supports and questions the use of strategies that reduce access to large quantities of paracetamol.6,9-11,20,26 Many of these studies concern the effect of the legislative changes introduced to the UK in 1998. This legislation limited the maximum quantity of paracetamol available for purchase in pharmacies to 32, 500 mg tablets (16 g in total), and in all other outlets to 16, 500 mg tablets (8 g in total).12,13

Although several studies have found there were no changes to paracetamol-related suicides, or referrals to transplant units in Scotland,1,19,21 some studies have found strong indications of the legislations effectiveness across the UK, with evaluations reporting a 20% reduction in paracetamol-related overdoses, a 22% reduction in deaths and a 30% reduction in liver unit admissions.13

These findings have been challenged. A 2007 study by Morgan et al observed similar trends for deaths relating to anti-depressants, paracetamol compounds and aspirin.22 One weakness of this study is that aspirin was not a suitable control comparison, as it was subject to similar restrictions to paracetamol under the legislation.22,23 Despite that, Morgan’s findings raise doubt as to whether reductions in paracetamol-related deaths can be attributed to the UK’s legislation change, or may be related to an overall trend in all poisoning-related deaths.

To further investigate the effectiveness of the UK legislation, Hawton et al (2013), conducted an analysis of paracetamol-related deaths and liver transplant registrations, adjusting for potentially confounding trends in all drug poisoning and suicide-related deaths. The analysis observed a 43% reduction in paracetamol-related death and a 61% reduction in paracetamol-related registrations for liver transplants, after adjusting for non-paracetamol poisonings. In addition, both Morgan and Hawton found a
significant downward step-change for paracetamol-related deaths immediately after the legislations commencement in 1998, which was not observed by other forms of poisoning.\textsuperscript{19}

The variation in results may be best explained by a wide variation in legislative compliance amongst retailers, with many individuals who overdosed on paracetamol after 1998, reporting to have purchased quantities in excess of the legislative restrictions.\textsuperscript{23,24,25} This highlights the need to ensure adherence to regulations.

Both prescriptions and online pharmacies have also been found to be the source of unsafe quantities of paracetamol supply. Studies have found a significant proportion of prescribed paracetamol to be above the recommended dosage in both hospital and general practice settings.\textsuperscript{2,30,31} Likewise, surveys of online pharmacies have found that many fail to supply information on the pharmacy's country of origin, accreditation, and appropriate use of medicine. A large number of online pharmacies did not collect key customer safety information; did not have systems to detect the accuracy of customer information; and some did not require prescriptions for prescription-only medications.\textsuperscript{27,28,29} Methods to ensure safety procedures are followed could aid in reducing paracetamol overdose rates.

Discussion

Paracetamol is the most common cause of overdose in many developed countries. Statistics from Wellington Hospital's ED and the National Minimum Dataset demonstrate New Zealand is no exception to this rule, with paracetamol overdoses accounting for 22–23\% of medication poisonings. Of these, poisonings were more common among young females under the age of 20 years.

Paracetamol is often selected for intentional overdose, as a method of self-harm and suicide because of its availability, affordability, known danger and potential to cause death.\textsuperscript{6-8} In 2012, the average estimated cost of hospitalisations for poisonings with aminophenol derivatives, according to data from public hospitals in New Zealand, was $1,702.71. If multiplied by the number of poisonings for that year (1,712), the total estimated cost of aminophenol poisonings from public hospitalisations in New Zealand in 2012 would have been $2,915,039.

New Zealand does not restrict the amount of paracetamol that can be purchased in pharmacies, and has a set limit of 10 g per packet for all other outlet types, with no limit on the number of packets that may be purchased.\textsuperscript{16} This is comparably less secure than the United Kingdom, who have taken steps to restrict paracetamol sales to a maximum of 16 g per transaction in pharmacies and 8 g per transaction, for all other outlets.

In New Zealand, the New Zealand Food and Grocery Council have advocated to the Medicines Classification Committee of Medsafe that the maximum packet capacity should be increased to 12.5 g to align with Australia and free trade agreements.\textsuperscript{4,18} This is of concern, because acute ingestion of 10 g of paracetamol or more (or 200 mg/kg) within an eight-hour period requires hospitalisation and investigation for toxicity.\textsuperscript{17} This is the same quantity currently available in New Zealand in a single packet for general sale, providing little protection from the risk of overdose. Restricting the quantity to 8 g per sale to align with the United Kingdom may be a more suitable level of protection, in order to prevent potential overdoses.

In addition, the widespread availability of paracetamol in quantities of 50 g or more in pharmacies is cause for concern. This lack of restriction on packet size in pharmacies is compounded by the lack of professional supervision when paracetamol purchases are conducted through online pharmacies. While the survey conducted for the purpose of this article did not use systematic means to identify all online pharmacies in New Zealand, it did demonstrate there were numerous online outlets where paracetamol could be purchased in large quantities, with no measures in place to monitor the safety of consumers.

Due to the high proportion of toxic paracetamol overdose amongst those under the age of 20 years, further investigation into interventions that reduce supply and harm to this age group should be explored. This should include examining the potential benefits of a policy which places age restrictions on the purchase of paracetamol.
There are a number of factors that need to be considered before adopting restrictive strategies, including the potential to increase inequities by reducing access to affordable medication and restricting the free exchange of goods.\(^1\)\(^,\)\(^4\)\(^,\)\(^5\) However, a system similar to the UK’s legislation—to limit pharmacy sales to 16 grams, with a discretionary allowance of 50 grams—could be an effective overdose prevention strategy that provides a suitable level of flexibility for those with higher needs.

**Competing interests:** Nil

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9. Gunnell D, Murray V,


ARTICLE

Differences in acute general surgical admissions between obese or overweight patients compared to normal-sized patients

Richard Flint

ABSTRACT

AIM: Obesity is changing the pattern of modern health and illness. Despite its adverse effect on medical ailments such as diabetes and ischaemic heart disease, its effect on acute general surgical conditions is unknown. This study aims to determine the effect that excess weight and obesity have on acute general surgical conditions.

METHODS: A prospective observational cohort study comparing the pattern of acute general surgical admissions in patients with a BMI >25 kg/m$^2$ to those with a normal BMI from a single tertiary-level hospital.

RESULTS: There were 2,676 (21.5%) patients who were overweight or obese (mean BMI 32.4 ± 6.3 kg/m$^2$). These patients were significantly younger than those with normal BMI (48.3 ± 18.1 years versus 50.5 ± 22.4 years; p<0.0001). They had a shorter average hospital stay (2.9 ± 4.2 compared to 3.2 ± 5.0 days; p=0.14). However, more overweight patients required a visit to theatre (34% compared to 29%; p=0.0001, OR 1.25 (1.14 to 1.37; 95% CI)). Overweight patients were more likely to suffer from biliary conditions (13% compared to 8%; p=0.0001; OR 1.84 (1.60–2.10)) and pancreatitis (6% compared to 4%; p=0.0001; OR 1.71 (1.42 to 2.06)). In contrast, they were less likely to present with bowel obstruction (4% compared to 6%; p=0.0001, OR 0.63 (0.5 to 0.78)) or GI bleeding (4% compared to 6%; p<0.0001; OR 0.64 (0.51 to 0.79)).

CONCLUSIONS: Overweight or obese patients present at a younger age and with a higher predominance of gallstone related diseases.

Obesity is considered the greatest health risk of the modern era. The relationship between obesity and co-morbidities that lead to early mortality has been well established. Indeed, there is direct evidence for a causal relationship between body mass index (BMI) and medical conditions such as diabetes, vascular diseases, and certain cancers.¹ This leads to an increased rate of hospital admission for obese patients with diagnoses of ischaemic heart disease, stroke, and venous thromboembolism.² Yet these tend to be medical conditions, and the effect of obesity on surgical admissions has only been intimated. For example, it is known that obesity predisposes to gallstone disease,³ diverticulitis,⁴ and paraesophageal hernia.⁵ However, the significance of this on the composition of acute surgical admissions is yet to be clarified.

This current study investigates the hypothesis that obesity, or excess weight, alters the pattern of acute surgical diseases by assessing all admissions to the Surgical Assessment and Review (SARA) unit of Christchurch Hospital, New Zealand. This hospital is a 650+ bed institution that services a population of 514,680 people. The age-standardised prevalence of obesity (Class II, BMI >40 kg/m$^2$) in this population is 26.3%; that is equivalent to the national prevalence (29.1%; p=0.06).⁶ All patients older than 16 years presenting to this hospital with acute general surgical conditions (excluding trauma) are admitted to the SARA unit. Here, the treatment is initiated before they are admitted to a general surgical ward or discharged from the hospital. This current study is a prospective audit of the admissions to the SARA unit.
to determine any differences between those that are overweight and those with a normal BMI.

**Methods**

All patients that were admitted to the SARA unit between 1 January, 2012 and 7 March, 2014, were identified from a prospective database. Patient demographics (age, gender, race, body mass index (BMI)), duration of stay, theatre visits, and outcomes (type of discharge or death) were recorded. Patients were considered overweight or obese if their BMI was greater than 25 kg/m². The discharge diagnosis was recorded and only one diagnosis was credited to each patient (eg, a patient with gallstone pancreatitis was not counted as biliary condition and again as pancreatitis). The definitions are as follows:

- **Non-specific abdominal pain**: acute abdominal pain less than 7 days duration that resolved spontaneously with no diagnosis after exam and baseline investigations.
- **Appendicitis**: operative or radiological confirmation of inflamed appendix.
- **Biliary conditions**: biliary colic, cholangitis, or cholecystitis with radiographic evidence of gallstones.
- **Pancreatitis**: abdominal pain with amylase >1000iU or radiographic evidence of pancreatic inflammation irrespective of cause.
- **Neoplasm**: any neoplasm arising from a visceral organ or intra-abdominal structure.
- **Gastrointestinal bleeding**: presentation with melena, haematemesis, or haematochezia, irrespective of endoscopic or radiologic findings.
- **Diverticulitis**: abdominal colic with acute constipation or diarrhoea, fever or leucocytosis, with either radiographic evidence of inflamed diverticula or a past history of diverticulitis.
- **Bowel obstruction**: abdominal colic with radiographic evidence of small or large bowel distension.
- **Gastroenteritis**: abdominal pain with diarrhoea and/or vomiting, with either positive stool cultures or self-limiting course.
- **Peptic ulcer disease**: abdominal pain with endoscopic evidence of peptic ulcer.
- **Haemorrhoids**: internal or external haemorrhoids grade 1–4, thrombosis or prolapsed.
- **Cutaneous abscess**: subdermal abscess on trunk requiring incision and drainage.
- **Hernia**: incarceration of strangulation of a viscous through the abdominal wall as assessed by examination or radiology.

Length of stay was measured as the difference between the time of discharge from hospital (SARA or hospital ward) and the time of admission to hospital (either emergency department or SARA). It was calculated as total hours and converted to days for purpose of description.

All descriptive data is expressed as mean ± standard deviation. All statistical analysis was performed by Prism for Mac OS X version 6.0f (GraphPad Software Inc., San Diego, USA. Student's two-tailed t-test (non-paired) was used to analyse all nonparametric data and chi-squared with Yates's correction for all parametric data. Association was analysed by odds ratio, and expressed with 95% confidence interval.

This study was performed in accordance with the ethical standards of the National Ethics Advisory Committee of New Zealand that adheres to those of the 1964 Helsinki declaration and its later amendments.

**Results**

There were 12,429 patients (5,418 male; mean age 50.0 ± 21.6 years) admitted to the SARA unit in the 26-month study period (Table 1). The majority of patients were European (86.5%), with the next most prevalent race being Māori (6.4%). The average stay in hospital was 3.1 ± 4.8 days with 3,737 (30%) patients requiring at least one operation during their admission. Nearly all admissions ended with a routine discharge (11,873 patients; 95.5%) with 323 patients (2.6%) requiring transfer to another hospital, and 141 (1.1%) self-discharging. There were 92 (0.7%) deaths during the study period.
Table 1: Patient demographics and outcomes of patients admitted to SARA between January 2012 and March 2014. Patients are categorised into three groups, all patients (All), those patients with a normal weight (Normal), and those who were overweight or obese (BMI >25 kg/m²). Percentages refer to the proportion of patients within each group. NS: non-significant.

<table>
<thead>
<tr>
<th></th>
<th>All</th>
<th>Normal</th>
<th>BMI &gt;25 kg/m²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number</td>
<td>12,429</td>
<td>9,753</td>
<td>2,676</td>
</tr>
<tr>
<td>Age (mean ± SD; years)</td>
<td>50.0 ± 21.6</td>
<td>50.5 ± 22.4</td>
<td>48.3 ± 18.1</td>
</tr>
<tr>
<td>Male (44%)</td>
<td>5,418</td>
<td>4,254</td>
<td>1,164 (44%)</td>
</tr>
<tr>
<td>European (87%)</td>
<td>10,754</td>
<td>8,473</td>
<td>2,281 (85%)</td>
</tr>
<tr>
<td>Māori (6%)</td>
<td>790</td>
<td>571</td>
<td>219 (8%)</td>
</tr>
<tr>
<td>Asian (3%)</td>
<td>415</td>
<td>356</td>
<td>59 (2%)</td>
</tr>
<tr>
<td>Pacific peoples (2%)</td>
<td>264</td>
<td>186</td>
<td>78 (3%)</td>
</tr>
<tr>
<td>Other (2%)</td>
<td>206</td>
<td>177</td>
<td>39 (2%)</td>
</tr>
<tr>
<td>Operations (30%)</td>
<td>3,737</td>
<td>2,831</td>
<td>906 (34%)</td>
</tr>
<tr>
<td>Routine discharge (96%)</td>
<td>11,873</td>
<td>9,272</td>
<td>2,601 (97%)</td>
</tr>
<tr>
<td>Mortality (0.7%)</td>
<td>92</td>
<td>87</td>
<td>5 (0.2%)</td>
</tr>
</tbody>
</table>

Table 2: Discharge diagnoses of patients admitted to SARA between January 2012 and March 2014. Patients are categorised into three groups: all patients (All), patients with normal weight (Normal), and those overweight or obese (BMI > 25). Percentages refer to the proportion of patients within each group. Statistical comparison is between normal and BMI >25 within each diagnosis. NS: non-significant; OR: odds ratio.

<table>
<thead>
<tr>
<th>Discharge diagnosis</th>
<th>All N=12,429</th>
<th>Normal N=9,753</th>
<th>BMI &gt; 25* N=2676</th>
<th>Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td>NSAP*</td>
<td>2,006 (16%)</td>
<td>1,521 (16%)</td>
<td>485 (18%)</td>
<td>P=0.002; OR=1.1 (1.1–1.3)</td>
</tr>
<tr>
<td>Appendicitis</td>
<td>1,095 (9%)</td>
<td>900 (9%)</td>
<td>195 (7%)</td>
<td>P=0.002; OR=0.8 (0.7–0.9)</td>
</tr>
<tr>
<td>Biliary</td>
<td>1,099 (9%)</td>
<td>746 (8%)</td>
<td>353 (13%)</td>
<td>P&lt;0.001; OR=1.8 (1.6–2.1)</td>
</tr>
<tr>
<td>Bowel obstruction</td>
<td>674 (5%)</td>
<td>573 (6%)</td>
<td>101 (4%)</td>
<td>P&lt;0.001; OR=0.6 (0.5–0.8)</td>
</tr>
<tr>
<td>GI bleeding*</td>
<td>634 (5%)</td>
<td>538 (6%)</td>
<td>96 (4%)</td>
<td>P&lt;0.001; OR=0.6 (0.5–0.8)</td>
</tr>
<tr>
<td>Diverticulitis</td>
<td>620 (5%)</td>
<td>464 (5%)</td>
<td>156 (6%)</td>
<td>P&lt;0.001; OR=1.4 (1.2–1.7)</td>
</tr>
<tr>
<td>Perianal abscess</td>
<td>617 (5%)</td>
<td>460 (5%)</td>
<td>157 (6%)</td>
<td>P=0.018; OR=1.3 (1.1–1.5)</td>
</tr>
<tr>
<td>Pancreatitis</td>
<td>576 (5%)</td>
<td>411 (4%)</td>
<td>165 (6%)</td>
<td>P&lt;0.001; OR=1.7 (1.4–2.1)</td>
</tr>
<tr>
<td>Hernia</td>
<td>411 (3%)</td>
<td>300 (3%)</td>
<td>111 (4%)</td>
<td>P=0.007; OR=1.4 (1.1–1.7)</td>
</tr>
<tr>
<td>Gastroenteritis</td>
<td>384 (3%)</td>
<td>327 (3%)</td>
<td>57 (2%)</td>
<td>P=0.002; OR=0.6 (0.5–0.8)</td>
</tr>
<tr>
<td>Neoplasm</td>
<td>342 (3%)</td>
<td>291 (3%)</td>
<td>51 (2%)</td>
<td>P=0.003; OR=0.6 (0.5–0.9)</td>
</tr>
<tr>
<td>Cut abscess*</td>
<td>325 (3%)</td>
<td>230 (2%)</td>
<td>95 (4%)</td>
<td>P=0.001; OR=1.5 (1.1–1.9)</td>
</tr>
<tr>
<td>PUD*</td>
<td>199 (3%)</td>
<td>170 (2%)</td>
<td>29 (1%)</td>
<td>P=0.020; OR=0.6 (0.4–0.9)</td>
</tr>
<tr>
<td>Haemorrhoids</td>
<td>75 (3%)</td>
<td>63 (0.6%)</td>
<td>12 (0.4%)</td>
<td>P=NS; OR=0.7 (0.4–1.3)</td>
</tr>
</tbody>
</table>

*BMI is measured as kg/m²; NSAP: non-specific abdominal pain; GI bleeding: gastrointestinal bleeding; Cut abscess: cutaneous abscess; PUD: peptic ulcer disease.
There were 2,676 (21.5%) patients who were coded as overweight or obese. The precise BMI had not been charted in 322 patients. The mean BMI for the overweight or obese group was 32.4 ± 6.3 kg/m². These patients were significantly younger than those with a normal BMI (48.3 ± 18.1 years compared to 50.5 ± 22.4 years; p<0.0001), but there was no differences in gender. Pacific peoples and Māori represented the groups with the highest proportion of overweight patients (30% of all Pacific peoples and 28% of all Māori admitted). Asian people had the least proportion of overweight patients (14%).

The average stay in hospital for the group of overweight patients was significantly shorter than those with a normal BMI (2.9 ± 4.2 compared to 3.2 ± 5.0 days; p=0.14). Similarly, the mortality was less in the overweight group (5 overweight patient deaths (0.2%) compared to 87 normal BMI patient death (0.9%); p=0.0003, OR 0.21 (0.08 to 0.51). This was in contrast to the rate of operations with a greater proportion of overweight patients requiring a visit to theatre (34% of overweight patients compared to 29% of normal BMI patients; p<0.0001, OR 1.25 (1.14 to 1.34).

The diagnosis appeared to have greater uncertainty in overweight patients, as they were more likely to be discharged with a finding of non-specific abdominal pain (18% compared to 16%; p=0.0018, OR=1.20 (1.07 to 1.34)) (Table 2). For the remainder, there was a different diagnostic spectrum when compared to the normal BMI group. Overweight patients were more likely to suffer from biliary conditions (13% compared to 8%; p< 0.0001; OR 1.84 (1.60 to 2.10)) and pancreatitis (6% compared to 4%; p<0.0001; OR 1.71 (1.42 to 2.06). Similarly they were more likely to suffer from suppurative conditions (eg, cutaneous abscess, perianal abscess and diverticulitis) except for appendicitis. In contrast, overweight patients were less likely to present with bowel obstruction (4% compared to 6%; p<0.0001, OR 0.63 (0.51 to 0.78)), or GI bleeding (4% compared to 6%; p<0.0001; OR 0.64 (0.51 to 0.78)).

Conclusion

This study compares a cohort of overweight and normal-sized patients admitted with acute general surgical conditions over a 26-month period. It describes a different spectrum of diseases between the two groups, where overweight patients are more likely to present at a younger age, present biliary conditions, and have greater chance of requiring operative intervention.

In 1989, Irvin et al described an audit of 1,190 acute general surgical admissions where the most frequent diagnoses were appendicitis and bowel obstruction. Gallstone-related disease only accounted for 5% of admissions at that time. More recent audits have hinted at a changing pattern of ailments, with gallstone-related disease accounting for 7% to 12% of all general surgical admissions. It has long been known gallstone formation is enhanced in the obese population and occurs at a younger age. This current study suggests the increasing number of younger patients with gallstone-related problems is a reflection of the rising prevalence of obesity in the community, and indicates a changing pattern of acute surgical illness.

Current management of gallstone-related disease focuses on early operative intervention and acute cholecystectomy is the standard practise in our unit. This may explain why more overweight patients were admitted to the operating room in this current study. This increased demand on theatre access has significant implications when considering hospital resourcing in the future. Not only will overweight patients require more theatre access, but also lengthier theatre time as operations in this patient group takes significantly longer to complete. This may place strain on our fixed resource health system similar to what has already been described in other countries. It may be argued, however, that these problems may be offset by our findings of a reduced length of stay in overweight patients. Yet complications common to obese patients, such as wound infections, have not been captured in this audit and must be factored in when allocating resources. Furthermore, this reduced length of stay may be a feature of a younger population, and this effect will not persist as the obese generation get older.

Our study has also highlighted the difficulties in assessing overweight patients to arrive at a diagnosis. Nonspecific abdominal pain was the most common...
reason for admission, but at a higher level in the overweight patients. Although a clear diagnosis cannot be derived on initial presentation, recent studies suggest at least a third have a conventional cause that becomes apparent at a later date.\textsuperscript{15} Unfortunately, this current study was unable to assess the level of investigations that were used in this group, or the readmission rate. But it is likely that considerable resources are needed to establish a future diagnosis, with other reports revealing that 58\% of these patients require further imaging, and 12\% need endoscopy.\textsuperscript{15} These delays in diagnosis can lead to increased morbidity. This is best illustrated in studies on appendicitis, where complications are more likely to occur in those with delayed treatment.\textsuperscript{16} This is not insignificant considering 3\% of patients (60 patients, if extrapolated to this current study) who have been diagnosed with non-specific abdominal pain will have appendicitis.\textsuperscript{15}

Despite these concerns, there is room for optimism. A surprising finding in this current study is that the proportion of overweight patients admitted to hospital did not mirror the proportion found in the population. It is estimated that 62\% of adult New Zealanders are overweight or obese,\textsuperscript{17} yet only 22\% of patients in this current study had a raised BMI. Obesity is a well-established base for poor health, and a leading cause of preventable death,\textsuperscript{19} yet this may become more of a problem for the medical, rather than surgical, communities. It is beyond the scope of this current study to extrapolate the findings as proof that obesity modulates acute abdominal conditions. Yet it is tempting to postulate how this may be true. It has been well established that adipose tissue is not inert, but a prolific producer of inflammatory and immunological cytokines and peptides.\textsuperscript{20} Omentum is rich in adipocytes and has long been regarded as the ‘abdominal policeman’ that promotes healing and controls infection by its rich production cytokines.\textsuperscript{21} The hypothesis that obesity increases omental fat that modulates intrabdominal diseases can be supported by findings of a reduced perforation rate in obese children with appendicitis.\textsuperscript{22}

This current study also showed that bowel obstruction was observed less often in overweight patients. Small bowel obstruction is nearly always a result of prior surgery, but may occur several months after the initial operation. Studies evaluating immediate postoperative complications have found no influence from obesity, but long-term outcomes are often missing.\textsuperscript{23} The findings from this current study may give a clue to a prolonged effect of obesity in surgery. Possible mechanisms that lead to a reduced small bowel obstruction may include a reduction of adhesion formation from cytokine modulation as theorised above. Or the increased bulkiness of the adipose mesentery may restrict small bowel mobility that limits twisting of the bowel. If true, this could be a source of further optimism, as adhesive small bowel obstruction is a resource heavy condition. For example, a large British audit showed patients with adhesive small bowel obstruction spent an average of one week in hospital, if treated conservatively. Unfortunately, two-thirds required an operation that lengthened the stay to an average of 16 days.\textsuperscript{24} However, the current findings may be unrelated to a change in pathology and may just reflect a younger population that have not had prior surgery. For example, trials of bariatric surgery found that postoperative bowel obstruction was not an uncommon finding, occurring at a rate similar to other surgeries—no matter if the approach was laparoscopic or open.\textsuperscript{25}

Although this current study indicates a different pattern of acute surgical illness in overweight patients, the results need to be considered in view of its limitations. There was no ability to adequately assess the level of co-morbidities between the two cohorts. It is conceivable that the overweight group had a greater level of diabetes, which would have influenced the proportion of patients with suppurative conditions, such as pilonidal disease. Furthermore, it is likely that the overweight group have had less prior surgery given their younger age. This would make bowel obstruction less likely and may have confounded the results. It was also beyond the scope of this current study to evaluate the various types of operations between each group, and the effect of postoperative complications on the final results. For example, the overweight group had less bowel obstruction, so would...
be expected to have had less laparotomies, which require several days recuperation before discharge. Finally, there was no ability to follow patients beyond discharge, so longer term outcomes and diagnosis cannot be determined.

In conclusion, this current study compares a cohort of overweight or obese patients with normal-sized patients who were admitted with acute general surgical conditions. Overweight or obese patients appear to present with a different spectrum of disease at a younger age. Gallstone-related diseases dominate this spectrum and may be responsible for a greater operative intervention. This has repercussions when planning resources for the future. However, the proportion of overweight patients presenting with acute surgical conditions do not match the rate of excess weight/obesity that is found in the community. This may not persist, as the obese younger generation gets older. Alternatively, it may indicate that obesity modulates acute surgical diseases and leads to tantalising theories about the complex role that adipose tissue may have on these age-old surgical ailments.

Competing interests: Nil

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Risk management and clinical practice
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2015 has seen many media reports of suicides by those who have attended psychiatric services. There have been front page headlines, television news and current affairs items, sometimes with dramatic headlines bearing challenging relationships to the content. The relevant service providers are often not consulted, have a different version of the facts, or are portrayed as having poor standards of practice. The media reports usually dwell on the hours or days before death, emphasising ‘last-minute’ prevention opportunities lost, and with them overt or implied attribution of blame. Services have been criticised for ignoring the views of families and for not over-riding consumer wishes.

As academic psychiatrists working with inpatient and community mental health services in New Zealand, we see the problems as more complex. They require consideration of the prime functions of psychiatric service provision, informed interpretation of the available evidence and consideration of national mental health policies. The following is intended to remind key stakeholders (eg, consumer and family groups, health service planners and funders, clinicians, coroners, the media) of these issues and to inform discussion.

The clinical task and a preoccupation with safety
New Zealand consumers should expect a comprehensive, evidence-based and effective personal recovery plan from mental health services. This requires services to consider a spectrum of obligations, responsibilities and possible interventions, with the aim of maximising function (including social and intra-familial) and minimising symptoms. The initial focus is generally on relief of problematic symptoms (eg, depression, mood elevation, thought disorder, delusions, anxiety, substance misuse, etc) coupled with the expectation, or hope, that restoration of function will follow. Often it will, but sometimes extensive rehabilitation is necessary, requiring significant multidisciplinary input. Making gains in managing relationships, community interactions, etc, requires the progressive build-up of confidence by the consumer, and often also by their family.

Gaining confidence requires succeeding in mastering tasks which involve elements of risks associated with life activities; mastering a series of considered risks. This is difficult to achieve if the dominant concern and thrust of clinical management is a defensive preoccupation with safety; this applies to both consumers and clinicians.

Like many Western mental health services, those in New Zealand are currently committed to a recovery model. This aims to place the consumer at the center of management planning and to support recovery of autonomy, irrespective of persisting symptoms. Patient-centered care and ‘continuous improvement’ are a part of this. Its origins can be seen to be combining the centrality of autonomy as an ethical principle and the utility of quality improvement.

To facilitate recovery, some elements of risk in management plans are inevitable and ideally require joint discussion between treating team and consumer, with family input where available and appropriate. Such risks need to be assessed, but the fact that these are based on estimates, and thus subject to error, must be recognised. Future behaviour cannot be reliably predicted and thus clinical management plans need to
Suicidal ideation among the seriously mentally ill is common.\textsuperscript{3} Deaths by suicide are relatively rare, and murder caused by mental illness much rarer still. Statistical modelling has demonstrated that the best predictions are imprecise when applied to individuals, or when applied to groups over limited time periods. The number of false positives typically far exceeds correct predictions for such rare events.\textsuperscript{6} Physical safety can be increased, in the short term, by detention in a totally controlled environment, such as a secure locked facility. However, this fails to foster, and often impedes, regaining autonomy.

### Alignment of stakeholder interests

Attempted integration of the views of clinicians, consumers and families can lead to misunderstandings and difficulties. Treating teams are generally preoccupied with assisting consumers to change the problematic thoughts and behaviors that led to their presentation to services. Insightful consumers usually share that view. Where consumers do not recognise the need for treatment, but treatment is sought on their behalf by family or others in the community, the potential conflict between clinicians and consumers is often regulated by the Mental Health (Compulsory Assessment and Treatment) Act of 1992. In these circumstances, family and consumer views often differ, and clinicians' and family views also may not coincide. It is essential that clinicians hear the views of both consumer and family. However, there are times when clinicians must act, in the consumer's longer-term interests, in ways with which family or consumers disagree. Such actions need to be based on best evidence, rather than ideology.

Recent decades have seen an appropriate emphasis on consumers' and families. This is now embedded in formal national policies, training of clinicians, and service guidelines.

Anecdotal evidence from service-level reviews and formal enquiries, etc, suggests that what is lacking is guidance on the appropriate weightings to allocate to different people's opinions in situations where consensus is elusive. Although issues of continued detention or enforced medication are covered by the Mental Health Act, it is far less clear how modern treatment should support the consumer's return to functional life. Clinicians often see a need to take short-term risks for long-term gain, usually after discussion and agreement with the consumer. Sometimes, their family may see that risk as a step too far, too fast. At times, but uncommonly, there can be the tragedy of long-term hospitalisation and invalidism through risks not taken.

Clinicians are usually confronted with a complex mix of individual's rights, family concerns, and community interests or safety. They are also aware of the many knowledge gaps surrounding human behavior or mental illness, which make both infallible decisions and policy guidance difficult. While we support best efforts to secure consensus in situations of conflict, we also urge that when adverse outcomes occur, those involved in investigations pay due heed to the complexities of people's lives, the limitations of risk prediction, and the importance of management driven not by risk avoidance, but by the aim of achieving recovery and regaining mental health rather.

### Conclusions

Service quality requires the reliable delivery of comprehensive clinical management aimed at functional recovery. Good treatment will require judicious risk taking, in a context where risk prediction is difficult and imprecise. When key parties disagree, we propose that clinicians act in the perceived long-term interests of patients to restore their autonomy, taking account of the best available evidence and the consumers' medium-term goals. Part of the therapeutic context for those plans is that, as with many physical illnesses, treatment will not always be successful.
VIEWPOINT

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The case for a systematic policy approach to free primary health care for vulnerable groups in New Zealand

Lik Loh, Siobhan Trevallyan, Steve Main, Leo Revell, Vivienne Patton, Akindele Ojo

ABSTRACT
Unmet health care needs and health inequities are prevalent in New Zealand. Throughout New Zealand's history, the power dynamic between general practitioners, as a professional group, and the government has contributed to policies directed at primary-care access barriers not being fully realised. This has given ‘third sector’ (non-government, non-profit) clinics a continuing role in delivering primary care services to vulnerable populations. The viability of free clinics, 18 of which were identified in our survey, is threatened by their funding and staffing structures. We contend that general practitioners have a stake in reducing health inequities and that there is a strong case for a more systematic policy approach to primary health care provision for vulnerable populations in New Zealand.

Primary health care services, free at the point-of-use, are being rolled out nationwide to children under 13 years. Is there also a case for a systematic policy approach to the provision of free primary care access that does not discriminate by age? This is a call-to-action paper by a group of general practitioners, past and present, at free clinics across the country. Free clinics are a rarity in New Zealand and comprise a special subgroup of ‘third sector’ (non-government, non-profit) clinics. In an email and telephone survey of Primary Health Organisations (PHOs) and primary care governance teams in regions without a PHO, we found 18 primary care clinics currently offering free general practitioner consultations for patients of all ages (Figure 1). We advocate for a more systematic approach to delivering free primary care services for populations with the poorest access to, but the most need for, these services. We are writing to policymakers, clinicians in governance roles, and general practitioners who wish to improve primary care access for vulnerable populations.

First, we describe the target population of free clinics as those patients most disadvantaged towards health care access and health outcomes in New Zealand. We then give examples of how the collective power of general practitioners greatly influences the effectiveness of primary health care policy targeting vulnerable patients. Finally, we discuss non-profit clinics serving vulnerable patients, the limitations of these clinics, and the role free clinics might play as a special subgroup of ‘third sector’ clinics.

Free clinics serve a particular target population
Fifteen percent of adults, and 6 percent of children in the most recent New Zealand Health Survey reported not visiting their general practitioner because of cost in the previous 12 months.1 These figures were higher for Māori adults (25%), Pacific adults (21%), and adults living in neighbourhoods with the most deprived NZDep2006
Groups disadvantaged with respect to primary care access—socioeconomically-deprived individuals, and Māori and Pacific people—have higher primary care-preventable hospitalisation rates than other demographic groups in New Zealand. While patients with the above socioeconomic characteristics are overrepresented at free clinics, these characteristics do not adequately identify the target population of free clinics—who in our experience are typically the “worst-off of the worst-off”.

Low-income status is by itself an insufficient descriptor of our target population. Rather than poverty per se, it is the deprivations in living conditions relative to wider society that matter for health and well-being. However, our patients are not just socioeconomically deprived, but also marginalised, vulnerable and ‘high-needs’, with whom complex consultations are common, and for whom poorer health outcomes as well as health inequities are the norm. Vulnerability describes the co-occurrence of a person’s exposure to risks and adverse events, and their susceptibility to harm arising from a limited capacity to adapt to these challenges. Vulnerability is both chronic and cumulative across the life trajectory of individuals. In families, vulnerability traits are transmitted between successive generations. Unstable accommodation, teenage parenthood, a history of childhood trauma,
health-damaging ‘risk behaviours’, and comorbid mental illness and substance abuse are examples of vulnerability factors prominent in our patient populations.

At the surface, our patients have high rates of use and non-use of health services. The labels ‘high-needs patients’ and ‘high users’ are often used interchangeably. While the literature does not contain a robust definition for the term, we recognise our patients as ‘high-needs’ by the complex mixture of ill-health and social problems they struggle to cope with. Consultations with this heterogeneous group of patients are usually complex and challenging.

Complexity in the health care context refers to “the patient-specific factors that interfere with the delivery of usual care and decision-making for whatever conditions the patient has”, a concept having dimensions of depth (severity of need) and breadth (range of needs). Complexity predisposes to a mismatch between the patient’s needs and the capacity of health services to support those needs.

The above factors are associated with a range of negative health outcomes in our target population. Multimorbidity, the coexistence of two or more conditions without a specific disease being the index condition, is prevalent among our patients, especially concomitant physical and mental disorders. Multimorbidity also develops at a younger age for our patients. These factors result in our patients bearing a disproportionate share of mortality and health care events compared with patients at other clinics. Because these health inequalities stem from social stratification and health care access barriers that are both avoidable and unfair, they are deemed health inequities.

In the rest of this paper, we consider how the interactions between government and general practice have contributed to health inequities for our target population, and how this may be redressed.

The target populations of free clinics are underserved by the health system

We believe that the health care needs of the target population of free clinics have been inadequately catered for throughout New Zealand’s recent history, largely because of the primary care cost barrier. Our main concern is that nationally, general practitioners and government have been unsuccessful in collaborating to remove this barrier for our target population. Our subsidiary concern is that existing mechanisms to reduce the cost barrier – the Community Services Card scheme, Very Low Cost Access funding, and discretionary discounting of general practitioners’ fees – have been inadequate in securing primary care access for those most likely to experience unmet health care needs.

Free competition usually unattainable in the health care market, and the target populations of free clinics do not as a general rule participate effectively in such a market. Income poverty and reduced health literacy prevent such patients from obtaining services commensurate to their health needs in an open market. Discretionary discounting by general practitioners of their fees, while important for offsetting these disadvantages for vulnerable patients, has become less frequent over time and is concentrated in paediatric and older persons. Discounting operates on an ad hoc basis, and financial and other considerations may prevent this practice from becoming more widespread.

The extent of ‘market failure’ in health is a strong argument for the state playing a leading role in the regulation and provision of health services. This applies especially to segments of the population for whom health services are undersupplied privately. Existing policy interventions to redress ‘market failure’ have been only partially successful. Targeted funding through the Community Services Card (CSC) scheme does not fully compensate for the effect of socioeconomic factors, so low-income status and Māori/Pacific ethnicity are not associated with increased primary care utilisation commensurate to health status. Uptake of CSCs is incomplete among the eligible population, and even among CSC holders unmet health need is prevalent because of cost. The aim of the 2006 Very Low Cost Access (VLCA) scheme was to ensure low patient fees at participating general practices, whose enrolled populations were stipulated to consist of at least
fifty percent “high needs” patients (Māori and Pacific patients, and those living in NZDep quintile 5 areas). However, a large proportion of patients who typically have lesser health needs benefit from capped fees at such clinics, and since the early years many clinics receiving VLCA funding did not have the required proportion of high needs patients. \(^{16}\) Serving patients who by definition have complex clinical needs but limited ability to pay also threatens the financial viability of VLCA clinics, especially since VLCA funding typically does not fully meet operating costs. \(^{16}\)

Government policy is constrained by political processes,\(^ {17}\) since policy is promulgated mindful of the government's popular mandate. Government services cater to the demands of the median voter; poverty is also associated with reduced political participation. So, even in the presence of demand from large minority groups for specific services, there may be little public provision of those services. *Government failure* thus occurs when demand for particular goods and services is not adequately met by the state or the public sector. The fractious relationship between general practitioners and government has at times in New Zealand's history limited the effectiveness of health policy aimed at reducing patient copayments and improving primary care access for socioeconomically deprived patients.

In the mid-1930s, only 25% percent of general practitioners\(^ {18}\) entered government contracts as part of the First Labour government's proposed national health insurance scheme that would provide general practitioner services free-of-charge to all patients. \(^ {19}\) The government was forced to rescind their prohibition of general practitioners charging their patients fees,\(^ {18}\) allowing a fee-for-service scheme to operate in parallel with the capitation scheme. In the 1990s, rather than stimulating competition within the primary health care sector, the neoliberal health reforms catalysed the formation of Independent Practitioner Associations as a means of aggregating the negotiating power of general practitioners to secure funding contracts in the new health marketplace. In the implementation of the Primary Health Care Strategy (PHCS) in the 2000s, the government eschewed statutory regulation of fees charged to patients. \(^ {20}\) In the post-2008 era, the long-standing distrust between government and general practice\(^ {21}\) as well as the mismatch between policy initiatives and the economic realities of operating general practice clinics as private businesses\(^ {22}\) prevented the abolition of user fees in primary care and many policy aspirations from being fully realised.

The implementation of government primary care policies for children clearly illustrates the power dynamic between general practitioners and government. The government initiative in 1985 to substantially subsidise primary care visits for all children was successfully blocked by the New Zealand Medical Association, who opposed the proposed patient copayment ceiling accompanying the scheme. A decade later, after intense lobbying by general practitioners, the 1996 free child health care scheme did not restrict the fees charged by general practitioners. Although the “Zero Fees For Under Sixes” package in 2007 did not guarantee universally free primary care for children less than six years during normal working hours, it achieved nearly complete uptake among general practices. Participation by general practitioners was similarly voluntary in the scheme’s expansion to provide free after-hours primary care services for children under six years in 2011, and free primary care services during normal working hours for children under thirteen years more recently. Whether increased subsidies with these policy initiatives fully cover consultation costs is likely to be a key determinant for general practices committing to providing free services to children.

Third sector clinics are not a viable solution for the primary health care needs of vulnerable populations

Given the combination of ‘market failure’ and ‘government failure’ as above, the need for ‘third sector’ clinics has continuously existed in New Zealand. Crampton defines the ‘third sector’ as non-government and
non-profit.25 He locates third sector agencies within the gap between the state and private sectors, this gap arising because of market failures and deficiencies in existing government-funded services.29 Since unlike for-profit private entities they need not cater to the business interests of their proprietors or shareholders, third sector agencies are better able to provide public goods that benefit populations rather than individuals, and respond to the interests of minority groups.12,24 Unlike government organisations, third sector agencies are able to develop service delivery innovations, unfettered by strict democratic and political accountability structures.12

Trade union-sponsored health centres were established in the 1980s, and ‘by Māori, for Māori’ clinics in the 1990s. Health Care Aotearoa (HCA) formed in 1994, and is a network of third sector clinics sharing as their explicit goals a commitment to the unmet primary care needs of Māori and vulnerable populations.25 Enrolled patients at HCA-affiliated clinics are uncharacteristic of the New Zealand general population in being younger, containing higher proportions of people from ethnic minority groups (36% Māori, 23% Pacific Islander), and being more socioeconomically deprived (55% residing in the most deprived NZDep96 quintile areas).23 Most HCA clinics are located close to their target population, situated either in urban areas with high levels of socioeconomic deprivation, or in medically underserviced, mainly Māori rural areas.23 These clinics offer lower patient fees,24 and are also more likely to provide population-focused preventive care services, as they are capitation funded, which gives financial incentives and the epidemiological tools to deliver these services.26

The heavy reliance of third sector clinics on government funding makes the government a key stakeholder for primary care in the third sector.23 Increased accountability to government and pressure to attain those outcomes on which funding is contingent force third sector organisations to reorient their operations towards measurable outcomes and clients for whom funding is available. Where external funding is reduced, services at third sector clinics risk being withdrawn. Also, because funding streams have traditionally been linked to general practitioner services, the loss of general practitioners from third sector clinics is often accompanied by drastic reductions in funding, which may threaten the financial viability of the service. Finally, because on average roughly sixty percent of general practice income is typically drawn from patient copayments,27 third sector clinics that depend mainly on capitation funding may find it insufficient to meet running costs. Serving 1,700 high-needs patients, the Calder Centre is affiliated with the Auckland City Mission and operated at an annual deficit of $300,000 in 2014, preventing them from offering free general practitioner services to their patients (Dimitri Germanov, Calder Centre, personal communication, 18 November 2014).

Free clinics are a special subgroup within third sector clinics, and are rare in New Zealand. Of the 1,058 general practice clinics currently in New Zealand (Joyce Brown, RNZCGP; personal communication, 29 October 2014), 296 receive VLCA funding,16 but in our survey only 18 clinics offer general practice services free-of-charge to all age groups. Half of these clinics are located in Special Medical Areas, originally established in 1941 by the government to attract general practitioners to rural and remote geographic areas, under a framework in which the doctors were salaried employees providing services free-of-charge to patients. The resident populations in the Special Medical Areas containing free clinics in our survey—Hokianga and Whangaroa in Northland, Opotiki District in the Bay of Plenty, and the East Coast of the North Island—are greater than fifty percent Māori, and have high levels of socioeconomic deprivation. Waiheke Island’s free clinic and the four free clinics in South Auckland are all located on marae, and the free clinic in Hamilton was formed through merger with a Pacific people’s trust.

The future of free clinics in New Zealand is endangered, due to their funding and staffing structures. The free clinics run by Ngāti Porou Hauora, an East Coast Māori health provider, have run at a financial deficit since 2011 because capitation funding does not cover operating costs.28 The free clinic in Dunedin is staffed by...
volunteer clinicians, but likewise operates at a loss.\textsuperscript{29} Because as discussed above the primary care funding paradigm has consistently been based on patient copayments supplemented by government subsidies, not charging copayments threatens the financial sustainability of clinics whose target populations are vulnerable patients. Clinics providing free services are liable to either close down (Wellington People's Centre) or introduce doctors' fees for consultations (the Kingdom Clinic in Christchurch).

**Conclusion**

At a national level, the goodwill of local groups makes for a haphazard solution to the unmet primary care needs of vulnerable populations. Across New Zealand's history, without sufficiently widespread support from general practitioners, the effectiveness of top-down government initiatives is limited. What is the way forward?

1. In our opinion, the general practitioner community is a major stakeholder in the effort to reduce health inequities. This is because primary care is the linchpin of population health and health systems, and health care itself can, unless it is equitably distributed, contribute to health inequities. We recognise, however, that the prevailing for-profit small business model of general practice in New Zealand is not conducive to removing the primary care cost barrier for vulnerable populations. Our message is therefore targeted at those general practitioners who are interested in expanding primary care for vulnerable groups, and who are willing to adopt new models of funding and delivering primary care services. Collectively, these general practitioners could lead the health system's approach to vulnerable patients, and provide mutual support in what is typically a challenging area to work. It is also this group of general practitioners with whom partnership in policy development is likely to be productive. There is precedent in Scotland, where “General Practitioners at the Deep End” serving the most severely deprived areas have banded together to achieve shared goals.\textsuperscript{30}

2. Primary health care access for vulnerable populations should occupy a more central position in health policy development. Whether New Zealand can afford universally free primary health care services is contentious, although we note that one of the reasons for withdrawing hospital user charges in the early 1990s was that administering these charges was costing the government more than simply providing free hospital services.\textsuperscript{31} Proportional universalism as advocated by the Royal New Zealand College of General Practitioners,\textsuperscript{32} represents a middle ground between universalism and a fully targeted approach, and involves distributing resources across the whole population progressively according to health need and socio-economic disadvantage. Low-income households are more likely to require after-hours services than their affluent counterparts,\textsuperscript{33} but the average cost of an after-hours visit (for example, $44 in 2013 for children over six years)\textsuperscript{34} is prohibitively expensive for the target population of free clinics. Cost barriers outside general practice (such as prescription charges and dental fees) also require attention, and a solution necessarily involves the social welfare and other sectors.

3. New Zealand needs a network of ‘safety-net’ primary care clinics. The precise policy solutions should be tailored to local circumstances, but will usually involve blending government funding with service delivery by third sector providers. Even where general practitioners are salaried employees, the level of public funding currently available makes the running of third sector clinics financially unsustainable. Regionally, it has been mooted that at least one PHO be given specific mandate for primary care services to high-needs groups, and this function be delegated to District Health Boards where
this is not possible.\textsuperscript{35} Workforce development, such as through the use of nurse practitioners, may enable third sector clinics to better serve vulnerable populations.\textsuperscript{36} Finally, the shortcomings of safety-net clinics in the United States are instructive in our development of a solution in New Zealand. The majority of such clinics are Community Health Centres, which receive federal government funding, but serve only small numbers of medically uninsured patients, and charge fees on a sliding scale. Free clinics in the United States are fewer in number, and rely on philanthropic funding sources and volunteer clinicians. While United States free clinics see greater proportions of uninsured patients, they tend to be open for limited hours, offer a limited range of services, and their patients are more likely to experience poorer continuity of care. Transferring these lessons to New Zealand, we believe that free clinics make a distinct contribution to that by third sector clinics generally, as free clinics serve vulnerable patients with more extreme levels of need. Even small copayments would result in unmet needs in these groups. Like their American counterparts, free clinics here are under-resourced relative to their task. We assert that funding primary health services for vulnerable populations is a core responsibility of government, and should not be devolved entirely to philanthropic or volunteer-based organisations.

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dunedin/268799/free-gp-service-making-loss.


Reducing perioperative harm in New Zealand: the WHO Surgical Safety Checklist, briefings and debriefings, and venous thrombembolism prophylaxis

Will Perry, Ian Civil, Simon Mitchell, Carl Shuker, Alan F Merry

ABSTRACT

New Zealand appears to have a relatively high rate of perioperative adverse events. The Health Quality & Safety Commission’s Safe Surgery NZ programme was introduced to address the rates of perioperative harm in New Zealand by promoting proper and effective use of the World Health Organization (WHO) Surgical Safety Checklist, and by encouraging use of operating room (OR) team briefings and debriefings. Venous thromboembolism prophylaxis is a key part of the checklist as deployed in New Zealand ORs, but it remains underused or variably used as well. Communication and teamwork are critical to improving patient safety and efficiency in the OR, and these interventions have demonstrated effectiveness in building and melding effective teams.

Perioperative harm in New Zealand

Since inception, the New Zealand Health Quality & Safety Commission (the Commission) has been particularly interested in the reduction of perioperative harm in our operating rooms (ORs). New Zealand appears to have a relatively high rate of perioperative adverse events. OECD data from 2012/13 suggested New Zealand had one of the highest documented rates of postoperative sepsis (1,260 per 100,000 hospital discharges in 2012/2013), the third highest rate of foreign bodies left in during a procedure (10.8 per 100,000 discharges), and was six countries behind the average for pulmonary embolism and deep vein thrombosis (PE and DVT), with a crude rate of 912 per 100,000 discharges. Only four OECD countries reported worse rates.1

Some argue that we are simply better at recording adverse outcomes, but regardless, these numbers are unacceptable. The Commission's Safe Surgery NZ programme was set up specifically to improve this situation through promulgation of several evidence-based interventions, including the World Health Organization (WHO) Surgical Safety Checklist, surgical team briefings and debriefings, and effective venous thromboembolism prophylaxis. These formed the backbone of the recent focus on reducing perioperative harm in the Open for Better Care campaign. This article provides background and context to this work, and a discussion of the evolution of perioperative care in New Zealand.

WHO Surgical Safety Checklist

The WHO Surgical Safety Checklist (the Checklist) is an evidence-based 19-item tool designed to improve patient outcomes by reducing error and improving teamwork and communication in the OR. The World Alliance for Patient Safety, recognising the unacceptably high rate of perioperative morbidity and mortality, identified ten universal objectives for safe surgery (see Figure 1) through consultative work in its second global challenge,
the ‘Safe Surgery Saves Lives’ initiative. These objectives were underpinned by an appreciation of the importance of teamwork in achieving good outcomes for patients undergoing surgery.

The success of checklists in high-reliability organisations such as aviation, the military, and nuclear power, as well as in central line infections, inspired the development of this tool (see Figure 2) to help achieve these objectives. From the outset, the Checklist was designed to improve teamwork, communication and culture in addition to facilitating certain important checks, and there is increasing evidence that its effective use can achieve all of these things.

Numerous studies have supplemented these initial findings, and results have been integrated into two systematic reviews. Some extended the scope of the intervention, but collectively they provide considerable support for training, briefings (see below), and other initiatives aligned with the Checklist in promoting teamwork, communication, and safety. The Netherlands’ Surgical Patient Safety System (SURPASS), for example, found a significant reduction in in-hospital mortality (1.5% to 0.8%) and in overall complications (27.3 to 16.7 per 100) after implementation of a comprehensive surgical checklist. More recently, a stepped-wedge cluster randomised controlled trial showed a reduction in complications from 19.9% to 11.5% with the use of the Checklist, giving an absolute risk reduction of 8.4. Length of stay decreased by 0.8 days, and mortality was significantly decreased in one of the two study centres, but not the other. Semel et al found its use reduced cost as well as harm, and a New Zealand analysis has suggested it will provide an annual steady state benefit of NZD 5.7 million to our health system, primarily through avoided complications of surgical care.

The introduction of the Checklist has not come without its challenges. Effective implementation requires the buy-in of all members of the OR team. This depends on leadership, and on an understanding of the Checklist’s wider objectives. Improvement requires concerted effort over time. In a large Veterans Health Administration (VHA) controlled study, training of medical teams in briefings, debriefings and the Checklist (amongst other things) was associated with a steady decrease in mortality over

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**Figure 1:** World Alliance for Patient Safety’s Ten Objectives for Safe Surgery

<table>
<thead>
<tr>
<th>Objective 1.</th>
<th>The team will operate on the correct patient at the correct site.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Objective 2.</td>
<td>The team will use methods known to prevent harm from anaesthetic administration, while protecting the patient from pain.</td>
</tr>
<tr>
<td>Objective 3.</td>
<td>The team will recognize and effectively prepare for life-threatening loss of airway or respiratory function.</td>
</tr>
<tr>
<td>Objective 4.</td>
<td>The team will recognize and effectively prepare for risk of high blood loss.</td>
</tr>
<tr>
<td>Objective 5.</td>
<td>The team will avoid inducing an allergic or adverse drug reaction known to be a significant risk to the patient.</td>
</tr>
<tr>
<td>Objective 6.</td>
<td>The team will consistently use methods known to minimize risk of surgical site infection.</td>
</tr>
<tr>
<td>Objective 7.</td>
<td>The team will prevent inadvertent retention of sponges or instruments in surgical wounds.</td>
</tr>
<tr>
<td>Objective 8.</td>
<td>The team will secure and accurately identify all surgical specimens.</td>
</tr>
<tr>
<td>Objective 9.</td>
<td>The team will effectively communicate and exchange critical patient information for the safe conduct of the operation.</td>
</tr>
<tr>
<td>Objective 10.</td>
<td>Hospitals and public health systems will establish routine surveillance of surgical capacity, volume and results.</td>
</tr>
</tbody>
</table>
**Surgical safety checklist**

**Sign in**

Confirm surgeon available
Before induction of anaesthesia, confirm with patient:
- Identity
- Site and side
- Procedure
- Consent

Site marked or not applicable

Does the patient have:
- Known allergies?
- Difficult airway or aspiration risk?
  - If yes, is equipment/assistance available?
- Risk of >500 ml blood loss recorded
  - (7 ml/kg in children)?
  - If yes, are adequate intravenous access and fluids planned?

Anaesthesia safety checklist completed

Check and confirm prosthesis/special equipment to be used

**Time out**

Before an incision, confirm all team members have introduced themselves by name and role

Surgeon, anaesthetist, and nurse verbally confirm:
- Patient
- Site and side
- Procedure
- Consent
- Any known allergies

Anticipated critical events
- Surgeon reviews: Critical or unexpected steps, operative duration, anticipated blood loss?
- Anaesthesia team reviews: Patient specific concerns?
  - Has the ASA score been recorded?
- Nursing team reviews: Has sterility (including indicator results) been confirmed?
  - Are there equipment issues or concerns?

Has antibiotic prophylaxis been given within the last 60 minutes?

Has the plan for VTE prophylaxis during the operation been carried out?

Is essential imaging displayed?

**Sign out**

Verbally confirm with the team after final count:
- The name of the procedure recorded
- That instrument, needle, sponge and other counts are correct
- How the specimen is labelled (including patient name)

- The plan for ongoing VTE prophylaxis
- Whether there are any equipment problems to be addressed
- Postoperative concerns/plan for recovery and management of this patient
the duration of the study (to an overall reduction in annual mortality of 18% compared with 7% in the control group). 22

There needs to be a sustained shift in teamwork, communication and attitude to safety, which does not happen instantly (see Box 1).

A New Zealand perspective

The WHO Surgical Safety Checklist is used in the majority of surgical cases in New Zealand, in every government hospital and in the vast majority of private facilities. However, although ‘adoption’ of the Checklist is widespread, a recent survey has shown that use is not consistent, and that there is considerable variability in participation across professional groups. 30

This is likely to undermine the Checklist’s potential benefits and there is ongoing effort to evaluate barriers to compliance with administration of the Checklist and to engagement of OR teams in the process, and to identify ways in which these barriers can be broken down.

Since participation in the original WHO Checklist study, 11 the University of Auckland Group has maintained a long-term focus on studying these matters. Utilising direct observations by trained collaborators, they have demonstrated variable compliance with administration of the three Checklist domains (Sign In, Time Out, Sign Out) and the associated Checklist items in a milieu where all Checklist domains are initiated and led by the circulating nurse from a paper copy of the Checklist. For example, an audit published in 2011 31 quantified compliance in the Auckland District Health Board (DHB) OR suite that participated in the original WHO study. Several years after completion of the study, there was good compliance with administration of the Sign In and Time Out domains (99% and 94% respectively), but the Sign Out domain was administered on only 2% of occasions. There was substantial variation in compliance with administration of the individual Checklist items, with some being articulated in 100% of cases, while others were used on as few as 27% of occasions. A second audit in the same operating suite some two years later reported little change in these compliance data, although the Sign Out domain had improved to 22% of occasions. 32

Another concerning outcome of both studies was the finding that engagement of the OR teams (surgeons, nurses, and anaesthesists) in the process was poor, even when a liberal definition of ‘team engagement’ was used; at least one member of the team

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Box 1: An implementation case study: Ontario

The Canadian government mandated ‘compliance’ with use of the Surgical Safety Checklist as a compulsory patient safety indicator to be reported on biannually by Ontario hospitals in 2010. 23

A March 2014 study of 101 Ontario hospitals failed to show statistically significant improvement in mortality or complications three months after the Checklist’s introduction. 24 Adjusted risk of death was 0.71% (95% confidence interval: 0.66 to 0.76) before and 0.65% (0.60 to 0.70) after implementation of the Checklist (p=0.07).

On the day of the study’s publication, Canada’s largest circulated national newspaper wrote, “a large new Canadian study is calling the checklist orthodoxy into question.” 25 However, many of the procedures were elective, with low baseline mortality, and the study may have been underpowered.

More importantly, three months is simply too early to expect any substantial shift in practice, particularly in the absence of a thorough implementation initiative.

In response to the Ontario findings, Haynes et al noted, “Government-mandated adoption often results in high rates of reported compliance without true behavior change.” 26 Two recent papers from the UK and Spain also support a similar discrepancy between reported compliance and ‘meaningful compliance’—that is, between ‘ticking boxes’ and using the Checklist effectively—arising from centrally mandated use without work to promote the buy-in of clinicians. 27,28 The authors of the Ontario study acknowledged the challenges associated with mandated use. 24 In an accompanying editorial, Lucien Leape suggested, “The likely reason for the failure of the surgical checklist [was] that it was not actually used.” 29 The study did not measure compliance, which is akin to a drug trial with no measure of how many participants actually took the drug.

The findings of this study add an important contribution to our understanding of the role of the Checklist. It is, and always has been, just a new tool to facilitate process improvement. Tools only work if used and, indeed, used well.
must have ceased all activity apart from attending to the Checklist for the team to be considered engaged. For example, during Time Out when all three teams were invariably present, engagement of all teams was only seen on 14% of occasions. Similarly, during Sign In, when the nursing and anaesthesia teams were invariably present (and surgeons almost always absent), engagement of both teams present was only seen on 39% of occasions. It was also telling that in 300 Checklist domains observed there was not one instance where all staff (every member of every team) in the OR were properly engaged in Checklist administration.

Considerable thought has been given to identifying the reasons for the various problems identified in the above studies.

Omission of Sign Out appeared attributable to the fact that it was not as clearly linked to an identifiable OR event as the other two Checklist domains. There was thus no naturally occurring aide-mémoire to signal that Sign Out should be initiated.

Selectivity in Checklist item administration appeared attributable to value judgments by administering staff as to which items were most important, or to perceptions that some questions might elicit a petulant response. For example, during Sign In, Checklist items with obvious face validity (those related to patient identity and the nature of the surgical procedure) were administered in 100% of cases. In contrast, checks on whether an airway problem was anticipated, or whether the surgeon was available, were administered in approximately 25% of cases. One item (the question about the anaesthetic machine check) typically elicited an irritable response and was the least-often administered (20% of cases). The latter illustrates the potential for negativity where the Checklist queries practices that a team might consider are ‘culturally engrained’ or immutably embedded in their practice.

Poor team engagement appeared primarily attributable to distractions by other concurrent tasks. For example, anaesthetists were prone to continuing with tasks like intravenous line insertion while the nurse administered Sign In, and surgeons were prone to continue to arrange the operating field while the nurse administered Time Out. Such disengagement by senior clinicians proved demotivating to the nurses, and there was a tendency for the Checklist administration to be truncated, but for tick-boxes to be checked anyway to indicate compliance. This practice has been noted in other New Zealand surveys.

Strategies to address all of these issues have been conceived and are in the process of being rolled out across Auckland DHB. A policy to link Sign Out to completion of the first swab and instrument count has brought clarity and consistency to the timing of this domain. After consultation with staff, all domains of the Checklist have been modified in order to remove some redundant items and to clarify the meaning of others. Most significantly, a radical change in the administration paradigm has been introduced. Paper Checklists and their associated tick boxes have been abandoned, and the Checklist now appears in all ORs as three large wall charts (one for each domain) that can be read from a distance. The anaesthetist leads the Sign In domain, and the surgeon leads the Time Out domain; the obvious logic being that placing the team most prone to disengagement in charge of administering the relevant domain is likely to ensure they remain engaged. The use of this system in the Counties Manukau DHB ORs appeared to result in better team engagement.

Airline pilots do not tick boxes on forms when they use a checklist. The Checklist was never intended to be used to record compliance with key processes—it was intended to improve compliance with these processes. Changing to a shared leadership paradigm and abandoning the ticking of boxes should make that explicit. The impact of these changes on compliance and engagement in the first Auckland DHB OR suite to roll them out is being audited, and it is hoped that the Auckland DHB experience may inform decisions regarding Checklist practice being considered by other DHBs across the country. These changes have been applauded and endorsed by the Commission, which has taken steps to ensure that they are reflected positively in the relevant national Quality and Safety Marker.
Briefings and debriefings for surgical teams

In the 1970s, investigators discovered that human error accounted for 70% of all crashes in aviation, and that the majority of these “consisted of failures in leadership, team coordination and decision-making.” Communication failures are also the primary source of human error in the OR: in the US, the Joint Commission for Accreditation of Healthcare Organizations (JCAHO) reports communication as the root cause in more than 75% of operative and postoperative sentinel events. Team briefings and debriefings have been used routinely in air forces and the aviation industry for decades, and more recently as part of NASA’s Crew Resource Management (CRM), to combat these difficulties in communication in the cockpit. The introduction of briefings and debriefings to the OR has been more recent, but their value is becoming increasingly clear.

Einav and colleagues found surgical briefings reduced the number of nonroutine events per operation by 25% (from 2.1 to 1.6 events) and increased the number in which no nonroutine event was observed at all. Lindgard et al reported a decrease in communication failures in the OR (late, inaccurate, unresolved, or exclusive communications) from 3.95 per procedure before introduction of briefings to 1.31 after. A 2012 study in a large medical centre in Michigan found that “briefings and debriefings were a practical and effective strategy to surface potential surgical defects.”

A 2012 study in a large medical centre in Michigan found that “briefings and debriefings were a practical and effective strategy to surface potential surgical defects.” Using the Safety Attitudes Questionnaire, Makary and colleagues found briefings accounted for a reduction in OR staff’s perception of risk for wrong-site surgery, and improved perceived collaboration.

Teams also report improvements in efficiency with briefings and debriefings, in contrast to some perceptions to the contrary. For example, a Johns Hopkins study found preoperative briefings were associated with a 19% reduction in communication breakdowns in the OR, a 31% reduction in unexpected delays, and an 82% reduction in surgeon-reported unexpected delays.

In the UK, use of both checklist and briefing CRM techniques reduced list time to the point one orthopaedic surgeon commented he had increased his list from four to five hip replacements.

Briefings
Briefings are used to share important information between different team members and groups to orient them around the tasks ahead, and to anticipate potential unexpected events or deviations from normal practice. Einav and colleagues observe, “Surgical teams… are frequently not familiar with all of the available data and may be only partially informed about the surgical plan.” Briefings are a simple, short verbal interchange involving the whole operating team prior to commencement of a list, designed to ensure the team members have shared mental models and interpretations of plans, priorities, and potential hazards to patients. Their readiness and cohesion as a team is thereby increased.

Figure 3 below shows a recommended structure for briefings, which can be tailored to individual local practice and context.

Debriefings
Debriefings, used by flight crews since World War Two, are a form of post-action review. They are “the systematic process of sharing observations and interpretations of team processes and performance” after the operation—be it military or surgical—is complete. Debriefings enable teams to take the time to reflect and learn as a group from a real-time situation. After a list is complete, a team shares what went well and what didn’t go to plan, what can be learnt and what can be improved, and provide a forum to say thank you—or simply, ‘well done.’

Figure 4 shows a recommended structure for debriefings, which can be tailored to individual local practice and context.

Complexity, autonomy and teamwork
Briefings and debriefings complement the use of the Checklist, and as explained.
**Start-of-list briefing**

**1. Introductions**
- Ensure all team members are present and have introduced themselves
- Indicate that debriefing will take place at the end of the list

**2. List outline**
- Provide an overview of:
  - The cases on the list
  - Anticipated duration
  - Any changes or modifications to list
  - Any uncertainties, and identify ways of updating information during the day
  - Any other patient information not already noted on the list/notes

**3. Case events**
- Review the details for each case:
  - Patient name
  - Planned procedure
  - Estimated duration

- Surgical plan:
  - Key points and any specific requirements not already identified
  - Blood loss risk
  - Potential difficulties and contingency plans
  - Confirm specific equipment requirements

- Anaesthetic plan:
  - Type of anaesthetic
  - Any issues or concerns
  - Difficult airway or aspiration risk

- Repeat Step 3 for every case

**4. Staffing & questions**
- Confirm everyone is clear on their roles and responsibilities
- Ask team if they have any questions or concerns
Figure 4: Structuring a debriefing

End-of-list debriefing

Wrap-up
Ensure all members of the operating team are present

What happened?
What went well? What did not go well?

Why?

Suggestions for improvement
What can we do better next time?
above, several major studies have shown the benefit of more comprehensive initiatives that incorporate various aspects of improving teamwork, communication and the reliability of process into surgical practice. The value of this becomes clear if one reflects on some basic principles of human performance in complex systems. “Human error is inevitable—particularly under stressful conditions”. The prime objective of most checklists is to mitigate this inevitability. However, “at the heart of the WHO initiative is something much more fundamental than simply avoiding mistakes.” Checklists are a way of bridging the simple, the complicated and the complex, of promoting uniformity in key practices, and of welding a team together around the needs of the patient before them.

In The Checklist Manifesto, Gawande draws from Zimmerman and Glouberman to describe and make clear this distinction between simple, complicated and complex situations using the example of an error during the excision of a rare kind of tumour (see Box 2).

In the example from Gawande, during Sign In the Checklist item prompted him to mention the potential for large blood loss; this reminded the nurse to check with the blood bank; there she found that units of packed red blood cells were missing, and this problem was addressed before it occurred. This is an example of getting a simple process right.

The Checklist aims to do more than this. In fact, it isn’t strictly just a checklist, and it is certainly not designed to ‘dumb down’ surgery or anaesthesia. Instead, it is a tool that asks clinicians to think, collaborate and plan around their patients, that also includes some important items to check. The expertise of our teams is not in doubt, but there are ever-present challenges to good teamwork in the OR: traditional training; fear of speaking out; power gradients; silo thinking; unstable teams; and shifting leadership. Good teamwork and communication become increasingly important as situations move from the routine and simple or complicated into the unexpected and complex. It is when decisions have to be made quickly—without the benefit of regular practice—that lives can be saved or lost by the way in which the team works as a team. In Gawande’s example, he believes that when the emergency occurred, not just the retrieved units, but also the teamwork and intimacy generated by the process of using the Checklist contributed to effective and coordinated efforts that were successful in saving a life as the patient lost almost his entire volume of blood into his abdomen within 60 seconds.

Willingness is all. In New Zealand, where informality is key, we have a unique opportunity to build on that informality and more rapidly tap the Checklist’s power to help us better communicate as a team.

**Box 2: Kinds of situations and perioperative examples (adapted from running text in Gawande A. The Checklist Manifesto)**

<table>
<thead>
<tr>
<th></th>
<th>Example</th>
<th>Perioperative examples</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Simple</strong></td>
<td>Baking a cake from a mix—there is a recipe</td>
<td>Anaesthetic machine check; ensuring there are sufficient units in the blood bank for a foreseeable complication</td>
</tr>
<tr>
<td><strong>Complicated</strong></td>
<td>Sending someone to the moon—iterable, steps can be established, a series of problems surmounted, but no straightforward recipe exists</td>
<td>Removal of an adrenal gland containing a pheochromocytoma</td>
</tr>
<tr>
<td><strong>Complex</strong></td>
<td>Organic, and not iterable, like raising a child. “Expertise is valuable, but most certainly not sufficient...[and] outcomes remain highly uncertain.”</td>
<td>Ensuring the team is sufficiently in sync to respond rapidly and adequately to an accidentally torn vena cava</td>
</tr>
</tbody>
</table>
around anaesthetised patients' needs, rather than around spurious or outdated hierarchies and perceived rights to practise autonomously. Autonomy, based on authority, is outmoded healthcare today. It is reasonable for patients to expect that teams will work together to implement evidence-based medicine, and that appropriate tools will be used to improve the reliability of processes. When asked, patients support the use of the Checklist. Good teamwork and communication avoids harm, saves lives, and improves efficiency, and so do simple tools to improve processes through checking.

**Venous thromboembolism (VTE), surgical safety and the Checklist**

The WHO Surgical Safety Checklist was always intended to be modifiable and tailored to the processes, methods and contexts of the countries and facilities where it is used. Ensuring that adequate VTE prophylaxis has taken place before skin incision is a core part of the Checklist as adapted for the New Zealand context, as it is for the NHS Checklist in England and Wales, and elsewhere. The implications of VTE prophylaxis are different in different areas—Asia, for example, where reported rates are very low.

Despite the evidence, and the availability of clinical practice guidelines for the last twenty years, and the clear arguments for risk assessment screening and prophylaxis, effective VTE prophylaxis remains underused or variably used in New Zealand operating theatres.

The Health Quality & Safety Commission's June 2014 Perioperative Mortality Review Committee report showed a PE-associated mortality rate in New Zealand of 8.7 per 100,000 patients who underwent an elective or waiting list procedure. About one in ten patients experiencing a PE will die as a result of their PE. That's about one death from PE in every 11,500 procedures in this country.

The risk of VTE increases tenfold in patients admitted to hospital, with contributing factors including general ill health or comorbidities, reduced mobility, smoking, and poor fluid intake. Major surgical procedures (particularly orthopaedic and other high-risk operations) are further risk factors, but patients who had short or minor procedures have also developed fatal PE. The incidence of PE is related to age—Australian data show peak incidence of DVT and PE in the 75–79 year old age group—but those aged 55–59 still contributed more than half the numbers of the older group. New Zealand estimates are lacking, but total hospital inpatient expenditure on VTE in Australia in 2008 was estimated at AUD 81.2 million, with each case of VTE costing in excess of $10,000.

Recurrence of proximal DVT occurs in up to 30% of patients within ten years of a first episode of venography-confirmed DVT, as does postphlebitic syndrome. DVT alone is still an issue, as it can lead to complication after complication.

Often surgeons can falsely assume anaesthetists have overseen DVT prophylaxis, and conversely. Prevention and screening are crucial—treatment of PE is difficult, and with fatal PE, 70% of patients die within three hours of onset of symptoms. Appropriate options for thromboprophylaxis include pharmacological methods, such as the use of anticoagulants, and mechanical measures, such as compression stockings or intermittent pneumatic compression devices (IPC). Patients are an important part of their own care, and it is important to keep them informed of more general measures such as drinking enough water, keeping active, and wearing compression stockings postoperatively. A combination of these thromboprophylactic techniques has been shown to reduce the risk of DVT and both fatal and non-fatal PE by more than 60%. The choice of thromboprophylaxis is less important than the need to consider it in every patient and implement some reasonable strategy in those who are at risk. Therefore, the New Zealand Checklist simply asks, “Has the plan for VTE prophylaxis during the operation been carried out?” As clinicians, it is worth reflecting on the fact that this question might matter to us if and when we become patients.
Conclusion

Effective teamwork, communication, and a high degree of reliability in process (including, notably, VTE prophylaxis) in surgical practice are crucial to reduce instances of perioperative harm. There is strong evidence that engaged and effective use of the WHO Surgical Safety Checklist can reduce patient harm, and briefings and debriefings can add to these gains while simultaneously improving efficiency. The Health Quality & Safety Commission’s Safe Surgery NZ programme is designed to ensure that the excellent outcomes sought for surgical patients in New Zealand are actually achieved. The Commission is grateful for the work undertaken by clinicians and DHBs to date.

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CLINICAL CORRESPONDENCE

Protrusion of nasal floor
Masayuki Motohashi, Makoto Adachi, Kei Ijichi, Yasunori Muramatsu

A 62-year-old woman was referred to our department with repeat asymptomatic swelling at the nasolabial region from 20 years ago. First findings revealed floor of the nose was elevated, hemispherical, fluctuant, without tenderness, and a nasal obstruction which seems to be a protrusion of the nasal floor. (Figure 1) Intra oral findings revealed nothing in particular. Magnetic resonance imaging showed the lesion was approximately 18 mm diameter, well demarcated, homogeneous, and rounded at the nasolabial region. (Figure 2; arrow) The lesion was removed surgically under general anesthesia (Figure 3) and a nasolabial cyst diagnosed pathologically. The patient was doing well after surgery. The protrusion of nasal floor is known as Gerber’s protrusion in Germany literatures, which occurs by nasolabial cyst, nasopalatine duct cyst, and radicular cyst at the anterior tooth of maxilla.
CLINICAL CORRESPONDENCE

Figure 2

Competing interests: Nil
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Massive localised lymphoedema: a new benign entity in the morbidly obese patient

Jeffrey Tan, Jamish Gandhi, Sanjay Sinha, Mohammad Rafique

Massive Localised Lymphoedema (MLL) is a rare and benign entity that is rapidly gaining recognition due to its association with morbid obesity. It presents a real diagnostic challenge for clinicians, even with histopathological analysis. It is relatively unknown and its true incidence, pathophysiology and transformation into a malignant process will need to be further evaluated. This case report highlights the important features associated with MLL and management at our institution.

Case Report

A 65-year-old morbidly obese Caucasian man presented to our Emergency Department with an infected, large, right-sided, inguinal, soft-tissue mass. The mass had gradually increased in size over 13 years, but he had only recently sought medical attention. The patient's medical history was significant for morbid obesity, with a body mass index of 71 kg/m². He was previously involved in a motor vehicle accident in 2003, where he suffered multiple traumatic injuries, including a fracture of his distal right femur, which required surgical intervention with an intra-medullary nail, and had a prolonged and complicated recovery secondary to hypertrophic non-union of his fracture. His other past medical history included diet-controlled type 2 diabetes, atrial fibrillation, hypertension and polyarthropathy. Family history and review of systems were...
Figure 2: lesion shown with arrow.

Figure 3: 10x magnification revealing fibroadipose tissue with intervening areas of oedema.
noncontributory. He was mostly confined to bed and dependent on carers for most of his activities of daily living.

On physical examination, he had a temperature of 39 degree Celsius, and was tachycardic at 115 beats per minute. The rest of his vitals were within limits. A large pedunculated inguinal mass was obvious from the end of the bed. It was erythematous and interspersed with areas of patchy ulceration on closer inspection. It was leathery and nodular and was separate from the testis which was obscured. (Figure 1)

He had a raised WCC of 21 (normal: 4–11 x 10E9/L), and a low albumin level of 27 (normal: 34–48 g/L ) with the rest of his blood panel including thyroid function test within normal limits. Further imaging with CT of abdomen and pelvis with contrast demonstrated a right inguinal mass measuring 42 cm x 41 cm x 23 cm (Figure 2), with extensive thickening and oedema of skin and soft tissue stranding throughout with signs of chronic venous congestion and multiple enlarged lymph nodes in the femoral triangle, but no intra-abdominal or testicular involvement.

He underwent complete excision of this mass, as there was a suspicion of this being a malignant lesion. A resection pattern was first marked around the base of this lesion and then excised.

The specimen weighed 4,520 grams. It was well vascularised and had a lobulated fibro-fatty appearance. Microscopically, it had a mature pale fibro-collagen tissue, adipocytes, intervening areas of oedema with no evidence of cytological atypia, mitotic activity, necrosis or haemorrhage (Figures 3 and 4).

MDM2 and D12Z3 was not amplified on Fluorescence InSitu Hybridisation (FISH) analysis. This was consistent with Massive Localised Lymphoedema.

He was discharged to a peripheral hospital one week after his initial surgery for rehabilitation.

**Discussion**

MLL is a new clinical entity that we as clinicians need to be aware of. There are a handful of papers in the English literature identified on PubMed on MLL since it was first described by Farshid and Weiss in 1998. However, the nature of MLL and similarity to soft tissue sarcomas still presents a diagnostic dilemma.

It is 1.5 times more common in females than males, with the average BMI reported with MLL to be 60.9 kg/m^2, and age of patients with MLL range from 19 to 81 years, making age a less relevant factor. It characteristically occurs as a single lesion at the lower
extremities, at the medial aspect of lower limbs, lower abdomen, scrotum or supra-pubic regions in morbidly obese patients. There is a single case report in the literature of concurrent lesions presenting in a single patient. Nevertheless, they are all asymmetrical and tend to run a slow growing process over many years, with recurrent episodes of cellulitis and ulceration to the lesion, as seen with our patient. The asymmetry and sheer size of MLL lesions restricts ambulation and mobility, thus limiting our patients to the bed or their home.

Gross evaluation of the MLL lesions tend to resemble thickened and indurated skin, similar to chronic lymphoedema and what other authors have described as a peau d’orange appearance. Subcutaneous tissue seen intraoperatively resemble a network of white fibrous steaks intersecting with lobulated pale adipose tissue, giving it a striking marbled appearance. This diffuse unencapsulated lesion seem to extend to the deep margins with no discrete solid component identified.

The microscopic findings of widened fibrous bands or septa separating lobules of mature fat seen with MLL are similar to well differentiated liposarcoma (WDL) or atypical lipomatous tumour (ALT). However, MLL is different histologically when compared to a neoplastic process, as there is an absence of atypical stromal cells, lipoblasts and atypical adipocytes. In addition, the collagen in MLL is finer and paler in contrast to the dense eosinophilic collagen type seen with WDL. Finally, the presence of reactive vessels at the junction of adipose and fibrous tissue is typical for MLL.

The natural progression and propensity of MLL lesions to transform from a benign to a malignant lesion is still unknown. There was a reported series of 5 patients where angiosarcoma was identified within a MLL lesion by Shon et al. Cutaneous angiosarcoma, in the setting of chronic lymphoedema, is also known as Stewart-Treves syndrome, where it was first reported in 1948 in a cohort of post-mastectomy patients who subsequently developed chronic lymphoedema of the upper limb. A recent literature review, by Chopra et al, reported a 14% incidence of angiosarcoma within a MLL lesion. Su et al described a case of widely differentiated squamous cell carcinoma arising from a scrotal MLL in a patient with a previous history of radiotherapy and surgery for rectal adenocarcinoma many years prior.

The exact pathogenesis of MLL is uncertain and is likely multifactorial. It is a form of secondary lymphoedema that is strongly associated with morbid obesity and lymphatic stasis, as it is the common denominator seen in all cases reported. Farshid and Weiss have suggested that the pathogenesis of MLL can be secondary to an enlarged abdominal pannus causing obstruction of regional lymphatics. Local trauma to regional lymphatics can also lead to impairment of efferent lymphatic flow thus contributing to lymphatic stasis.

Other factors associated with MLL include hypothyroidism and immobility, which understandably causes sluggish lymphatic contractility, chronic lymphatic engorgement and lymphatic valvular insufficiency which eventually leads to lymphatic stasis.

Conclusions
MLL is still a relatively rare and under diagnosed condition that when resected can bring upon a successful and better outcome for the patient. MLL is typically described as an asymmetrical, chronic, diffuse soft tissue lesion occuring in the lower extremity with an oedematus appearance akin to chronic lymphoedema in a morbidly obese patient. It is crucial that the main clinical features of MLL are highlighted to the histopathologist to facilitate the diagnosis of MLL.

As MLL is a recently described entity, a longer surveillance period after primary excision is needed to establish incidence of recurrence and malignant transformation.
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Bilateral vertebral artery dissection in a patient with Turner Syndrome following manipulation of the cervical spine

Jonathan S Stevenson, Steven Soule, Philip Parkin, David O’Neill-Kerr

Case Report
A 26-year-old female with Turner Syndrome (TS), treated with oestrogen replacement therapy, presented with vertigo, ataxia and paraesthesia of the left arm immediately following chiropractic neck manipulation. Magnetic resonance angiography revealed dissection and partial occlusion of the left vertebral artery at the C2/3 level with an associated acute left cerebellar infarct (Figure 1). A non-occlusive dissection involving the right subclavian artery extending 4cm superiorly into the proximal right vertebral artery was also identified (Figure 2). The patient was commenced on anticoagulant therapy and her symptoms resolved completely over the following 3 days.

Case Discussion
Turner Syndrome, affecting 1:2,500 live female births, results from the absence or partial deletion of one X chromosome. Cardiovascular anomalies are the major cause of increased mortality in TS, with aortic dissection a well-recognised complication. However, arterial wall abnormalities in TS extend beyond the aorta, with demonstrable dilatation and intimal thickening of the carotid and brachial arteries. This vasculopathy may predispose TS patients to cervical arterial dissection from minimal trauma. There have been two previous case reports of spontaneous cervical artery dissection in TS, describing a bilateral vertebral artery dissection and unilateral carotid artery dissection respectively. The literature, and this case report, suggest TS patients should be advised against cervical manipulation and also support the recommendation that clinicians have a low threshold for requesting imaging studies of the cervical and intracerebral vasculature in TS patients presenting with focal neurological deficits.
Figure 1: 3D Time of Flight MRA: Absent flow related enhancement V3/V4 segment of the left vertebral artery secondary to dissection (short arrows). Intramural haematoma right subclavian artery (long arrow).

Figure 2: Axial proton density with fat suppression: Right vertebral crescentic intramural haematoma (short arrow) and flow void (long arrow)
CLINICAL CORRESPONDENCE

Competing interests: Nil

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REFERENCES:
Screening for occult cancer in unprovoked venous thromboembolism

Venous thromboembolism may be the earliest sign of cancer. A previous study has reported that an incidence of up to 10% in the year following the venous thromboembolism. This suggests that such patients should have comprehensive screening tests.

This report concerns a study in which patients were randomly assigned to undergo limited occult-cancer screening (basic blood testing, chest radiography, and screening for breast, cervical, and prostate cancer) or limited occult-cancer screening in combination with CT of the abdomen and pelvis.

Of the 854 patients who underwent randomisation, 33 (3.9%) had a new diagnosis of occult cancer between randomisation and the one-year follow-up. No significant difference was found between the limited and limited plus CT groups. The researchers conclude that the prevalence of occult cancer was low among patients with a first unprovoked venous thromboembolism. Routine screening with CT of the abdomen and pelvis did not provide a clinically significant benefit.

Risk of gastrointestinal bleeding associated with oral anticoagulants

This population-based retrospective cohort study reviews the real world safety of dabigatran or rivaroxaban compared with warfarin in terms of gastrointestinal bleeding. The study sample included 4,907 users of dabigatran, 1,649 users of rivaroxaban, and 39,607 users of warfarin. None of them had used oral anticoagulants or had gastrointestinal bleeding in the previous six months.

No statistically significant difference was seen in the risk of gastrointestinal bleeding between dabigatran or rivaroxaban and warfarin. However, the researchers conclude that increased risks associated with dabigatran and rivaroxaban compared with warfarin cannot be ruled out.

Long-term effects of lithium on renal, thyroid and parathyroid function

Lithium is a widely used and highly effective treatment for mood disorders, but can cause poorly characterised adverse effects in kidney and endocrine systems. In this study, a retrospective analysis of laboratory data compares the incidence of renal, thyroid and parathyroid dysfunction in patients treated with lithium and control subjects who have not been treated with lithium.

Adjusting for age, sex, and diabetes, presence of lithium in serum was associated with an increased risk of stage three chronic kidney disease, hypothyroidism and hypercalcaemia. Women, particularly younger women, were at greater risk of developing renal and thyroid disorders than were men. Clearly, patients on lithium treatment need baseline measurements of renal, thyroid and parathyroid function and regular long-term monitoring.

Contract practice with friendly societies

There is a dispute at present between the lodge doctors and lodges in Wellington which presents some features worthy of comment. At present the lodge doctor is paid the munificent sum of fifteen shillings a year; in other words, three shillings and ninepence a quarter, and a half penny a day. For this payment he is bound to attend the lodge member and his wife and family. The family may number six or eight children, and the only restriction provides for attendance on boys up to 16 years of age and girls up to 18 years. These fortunate families may have the privilege of living three miles away from the doctor, and paying no extra mileage fees. The doctor may need to climb a mountain to reach the people. Possibly instead of three shillings for three months the extra ninepence was added as a compensation for topographical difficulties.

In justice to the lodges, we hasten to add that not all the lodge members avail themselves of medical advice every quarter or every year, but we think it will be admitted in general terms that the lodges keep the lodge doctors very busy. These ridiculously low charges were arranged about 25 years ago, when it was the belief that lodge members were poor and struggling, and the medical profession felt generously disposed towards these poor people. We know of a number of rich people in Wellington now who consult the

THE OSTRACISED AGAIN.
First Doctor B.M.A.: Real-ly, things are getting awfully absurd in the ah—Health Department. Fancay prosecuting a medical man for charging a paltry fee for—er—a vaccination case in his own surger-ay! How many of us have not also—
Second Doctor B.M.A.: But he was one of the ostracised friendly society fellows.
First Doctor B.M.A.: Oh—ah, yes; that’s so. Serves the old outcast right!
http://natlib.govt.nz/records/27576871
lodge doctors for themselves and their families, and it is no uncommon occurrence for the lodge patient to have more money in the bank than the lodge doctor. It is not necessary to remind medical readers that the cost of living has greatly increased and also the cost of conducting a medical practice according to present-day principles and requirements. The increased cost of living has been the main argument for the rise in wages which has been steadily going on in the Dominion.

The trade unionists of the lodges, however, appear to think that this is a good argument for their own use, but do not recognise its application to the claims of the doctors. We charge these good people, therefore, with inconsistency. If they possess the saving grace of humour, paterfamilias and his spouse must surely smile when their medical bill for a whole year for themselves and family is less than what they pay for a pair of trousers. The lodge doctor in Wellington asked for twenty-four shillings, and for a more reasonable scale of mileage fees, and was told that they should be content with the payment they were already receiving. The doctors therefore did not renew their contracts and the lodge patients now go to the lodge dispensary and get advice there, and have their old prescriptions dispensed again. The wonder is that lodge members consider it in the least advisable to have underpaid and dissatisfied doctors to attend them. We have known instances where lodges, rather than pay a good doctor something in reason, were prepared to engage the most hopeless medical derelict, and place their lives in his hands. It is passing strange.

An unpleasant feature of contract practice is that the combination of numbers may be used to oppress the individual. This was easily done in the old days, but now when at last the medical profession is well organised there will be a change for the better. We understand that a section of the Unfriendly Societies in Wellington is prepared to give the doctors fair treatment, and if so, the doctor will not only be reasonable but generous in their terms. At the present time many lodges are making extra payments for the benefit of lodge members on active service, and this should be taken into favourable consideration by the doctors in their final decision. Owing to this and other special circumstances at the present time connected with the war a very moderate advance upon the old ridiculously inadequate payment may reasonably be conceded; but from those lodges who wish to persistently exploit their doctors every medical man who is not a discredit to his profession should hold aloof.

The miserable pittance paid to lodge doctors in many parts of New Zealand would not be tolerated in any other country. The payments to panel doctors in the National Insurance scheme in England are very much better in comparison. When the war is over the scale of payments for contract practice in New Zealand generally will require to be revised and standardised but in the meantime any doctor who sells himself to a lodge for three shillings and ninepence a family quarterly has not a very high estimate of what he owes to his profession or to himself.

**Editorial: December 1915**

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**URL:**
In the recent article announcing the formation and first projects of the New Zealand Emergency Medicine Network (NZEMN) there was an important omission that I wish to correct. One of the first projects under the umbrella of the Network is the development of an airway registry for New Zealand. It was not acknowledged in the published article that this development is part of the Global Airway Registry formed as a partnership between the Agency for Clinical Innovation’s Emergency Care Institute (ECI) and the Royal North Shore Hospital (RNSH) in Sydney in 2013. On behalf of the NZEMN I would like to apologise to the developers and staff of the ECI / RNSH Global Airway Registry for this omission and acknowledge the support they have provided to the lead investigator of the New Zealand airway registry with respect to provision of support for ethics submissions and approval processes, development of project tools and information, data entry and feedback.


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