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Summaries

Legalising smokeless tobacco and/or oral nicotine products: some implications for population health

Jude Ball, Janine Nip, Janet Hoek

The Government appears poised to allow the sale of oral tobacco and nicotine products in Aotearoa New Zealand. Evidence that these products can help people quit smoking is lacking, as is evidence of the safety of long-term use. In contrast, the safety and efficacy of nicotine replacement therapy (NRT) has been rigorously tested; NRT products are widely available in this country to help people quit smoking, as are vaping products. Flavoured nicotine products are highly addictive, appeal to youth, and are being marketed by tobacco companies as lifestyle products using online marketing. ZYN (a Philip Morris product) is being sold online in New Zealand, in apparent breach of the current law (see https://zynnz.co.nz/). Given Aotearoa New Zealand's experience with youth vaping (i.e., we have the highest youth vaping rates in the world), a precautionary approach and rapid action is needed to avoid another regulatory failure.

Intensive management from diagnosis improves HbA1c at 12 months post-diagnosis: results from a prospective cohort study in children with newly diagnosed type 1 diabetes

Caroline Griffin, Erin Roxburgh, Neil Owens, Olivia Sanders, Sharon Walsh, Chloe Hudson, Janet Ferguson, Karen MacKenzie, Martin de Bock

We put in place a way of educating and managing children and whānau newly diagnosed with type 1 diabetes that we hoped would lead to long-term improved glucose outcomes. We showed that we could significantly improve outcomes at 12 months after diagnosis by making these changes. These changes were mainly about the whole team communicating the same messages to patients, using flexible insulin dosing and encouraging the use of continuous glucose monitoring.

Exploring training, involvement and confidence: a study of healthcare professionals in decision-making capacity assessments

Nicola Hickling, Clare M McCann, Lynette Tippett, Gary Cheung

This article describes the training experiences, confidence levels and current involvement of healthcare professionals in decision-making capacity assessments. This is important because previous research has pointed to a lack of available training for clinicians involved in this area of clinical practice. Low confidence levels and confusion around whose responsibility it is to conduct these assessments have also been raised. It was found that those not commonly conducting these assessments would like greater involvement, while those currently conducting them would like less involvement. There is an urgency to this area of clinical practice, with clinicians requesting training to ensure these assessments are being conducted reliably and accurately. There is evidence to suggest a shift in practice is being requested towards greater involvement of the wider healthcare team and reduced responsibility being placed on one individual or profession.

Perspectives of potentially eligible Indigenous Māori on a lung cancer screening programme: a qualitative study

Sarah R Colhoun, Kate Parker, Sharon McCook, Karen Bartholomew, Billie Baty, Anna Maxwell, Kataraina Pipi, Maria Marama, Sue Crengle

We recruited several small groups of Māori at risk of developing lung cancer and their whānau to explore their views about a potential lung cancer screening programme in this country. Most participants were enthusiastic about future lung screening, especially given the chance to learn more about the disease; they took a whānau-centred view towards earlier diagnosis. Participants named specific barriers to screening and these included fear of the disease and prior negative experiences of screening and the health system. They suggested interventions to alleviate potential barriers, such as practical assistance to attend screening. Our consultation with Māori in these early stages of programme design has meant the views of Māori who would potentially be eligible for this screening have been incorporated into the design of lung cancer screening.

Changes in alcohol-related emergency department presentations—a comparison of three waves in 2013, 2017 and 2022

Laura R Joyce, Lana Cleland, Elise Forman, Alex Hlavac, James Foulds, Rose Crossin

Emergency departments (EDs) around the world are increasingly overcrowded, associated with significant patient harm. Alcohol use is a known contributor to ED overcrowding. This was a study run in three waves in 2013, 2017 and 2022 where patients who attended ED after ingesting alcohol were interviewed to determine the amount and source of alcohol. There has been a change in the age profile towards a greater proportion of older patients attending ED with alcohol-related issues. In 2022, a greater proportion of alcohol was purchased from on-licence venues compared to previous years, although off-licence alcohol purchase and consumption in private locations remained the most common.

Should paediatric tonsillar asymmetry be an indication for tonsillectomy? A single centre experience

Georgia Mackay, Alina Rankin, Sheneen Meghji, Craig McCaffer

Children whose tonsils are different sizes are usually nothing to worry about; however, sometimes the tonsils are different sizes because the child has a type of rare tonsil cancer (lymphoma). Removing the tonsils for every child with different-sized tonsils is not advised, as the surgery poses its own risk. We found that children with tonsils with colour and texture changes, enlarged lymph nodes in the neck and pain were more likely to be associated with tonsil lymphoma. We also found that our clinical examination of tonsil size differences can be inaccurate and should be interpreted with caution. A holistic assessment, on a patient-to-patient basis, is advised for determining if surgical removal of the tonsils would be beneficial for a child with different-sized tonsils.

Differences in life expectancy within and between countries: implications for domestic TAVI guidelines in Australia and Aotearoa New Zealand

Thomas D Ryan, Jonathon B Ryan

Historically, severe narrowing of the aortic valve could only be treated by open heart surgery (SAVR—surgical aortic valve replacement). Today, some patients are offered an alternative, less-invasive procedure (TAVI—transcatheter aortic valve implantation). Because the long-term results of TAVI are still unknown, international guidelines recommend taking the patient's life expectancy into account when choosing between SAVR and TAVI. Specifically, the American guidelines recommend younger patients (under 65) undergo SAVR and older patients (over 80) undergo TAVI. However, these age-based recommendations are based on American life expectancy data. This manuscript is intended to assist local clinicians to interpret the international guidelines in the context of Australian and Aotearoa New Zealand life expectancy data. It recommends that Māori, Pacific people living in Aotearoa New Zealand and Aboriginal and Torres Strait Islander people should be given access to TAVI at a much younger age than the American guidelines recommend.

The simple gallbladder with a twist?

Neeraj Khatri, Ahmed Abdile, Fraser Welsh, Nicholas Smith

Gallbladder disease can present in different ways with different ways of managing and treating the problem. This case demonstrates one of the rare presentations in which the gallbladder is twisted on itself. Unlikely other conservative management options, surgery is required for this rare presentation. If not, there is a high chance of getting sick quickly.

Recreational ketamine use can lead to irreversible bladder damage

Daniel Eaton, Frank Kueppers

Recreational ketamine use in New Zealand is increasing. This increased use will be associated with more patients presenting with ketamine bladder syndrome. This syndrome is a condition that leads to significant urinary symptoms and can progress to irreversible bladder damage. Early diagnosis and ketamine cessation is critical to managing this condition. Other interventions are predominantly for symptomatic management.

Changing the script: medicine optimisation recommendations made during proactive multidisciplinary meetings with older adults

Katherine Bloomfield, Joanna Hikaka, Julia Brookes, Annie Tatton, Cheryl Calvert, Zhenqiang Wu, Michal Boyd, Kathy Peri, Dale Bramley, Martin J Connolly

Taking a lot of medications or medications that are no longer indicated can cause harm for older people. A team of specialists in older adult healthcare, including a geriatrician or nurse practitioner, clinical pharmacist and gerontology nurse specialists reviewed the health records of otherwise well older people participating in our research study. We met with participants, discussed their health and wellbeing concerns and together made a collection of recommendations about their future health. We made suggestions about medication in 78% of participants. We believe healthcare of older people would be improved with better collaboration and integration between general practitioners and specialists in older adult healthcare in secondary and community care.

Alcohol-associated liver disease and the COVID-19 pandemic in New Zealand—a single centre retrospective analysis

Kevin YY Chen, Michael TM Wang, Cameron Schauer

Our study looked at the severity and outcomes of alcohol-associated liver disease hospitalisations, comparing before and during the COVID-19 lockdown period in Waitematā district of New Zealand. There were no significant differences between the two groups. New Zealand's COVID-19 lockdown restrictions did not have a significantly negative impact in this regard compared to other nations.

Legalising smokeless tobacco and/or oral nicotine products: some implications for population health

Jude Ball, Janine Nip, Janet Hoek

The Government has repealed measures in the *Smokefree Environments and Regulated Products (Smoked Tobacco) Amendment Act* (SERPA)[1] that would have decreased the number of outlets permitted to sell the world's most dangerous consumer product, reduced tobacco's addictiveness and protected young people from a product that kills two thirds of its long-term users.[2] Strong public support for the SERPA measures[3] calls into question the Government's mandate for the repeal, which came as an unwelcome surprise to many.

Nonetheless, Associate Minister of Health Casey Costello has affirmed the Government's commitment to the Smokefree Aotearoa 2025 goal and "*achieving the less than 5 percent smoke-free targets* ***across all populations***" (emphasis added).[4] However, neither she nor Health Minister Dr Shane Reti have outlined how they plan to achieve the Smokefree 2025 goal. Indeed, notes from Associate Minister Casey Costello's office argued additional measures were "*unnecessary given New Zealand is likely to be Smokefree* ***by no later than 2027***" (emphasis added).[5] That statement is not consistent with modelling, which suggests that, even under an optimistic scenario, smoking prevalence would not fall below 5% among Māori women until around 2042.[6]

Associate Minister Casey Costello has advised that she "*will soon be taking a package of measures to Cabinet to increase the tools available that will actually help quit smoking.*"[4] Analysis of the minister's leaked notes reveals her emphasis on novel products containing nicotine;[5] her notes state: "*New Zealand smokers should have access to the widest range of smokefree products possible to achieve our 2025 objective.*"[5] They outline how proposed changes will "*bring into our regulatory framework nicotine containing pouches.*"[5] The planned approach appears to fulfil a clause of the National–New Zealand First coalition agreement, to "*reform the regulation of vaping, smokeless tobacco and oral nicotine products.*"

Aotearoa New Zealand does not currently allow the sale of smokeless tobacco or oral nicotine products (ONP), with the exception of Medsafe-approved nicotine replacement therapy (NRT), such as nicotine gum, lozenges and sprays. These NRT products have gone through the rigorous safety approval process for medicines required by the *Medicines Act 1981* and been available for several decades. The rationale for introducing new smokeless tobacco and/or ONPs rests on beliefs these pose fewer risks than smoked tobacco and provide people who smoke and wish to quit with "choice". The minister's plans to expand the nicotine product market by allowing new nicotine-containing products to be sold as consumer products rather than therapeutic products thus raises important questions, which we discuss below.

What are smokeless tobacco and ONPs?

Smokeless tobacco products include chewing tobacco and tobacco pouches, or "snus", which are made from tobacco leaves. Users place the product between their gum and lip or cheek and absorb nicotine through their oral mucosa. Snus (finely ground or chopped tobacco, generally contained in a small pouch) is a Swedish product originally developed commercially about 200 years ago and is now used widely among Swedish males.[7,8] Sweden exports snus products, although many jurisdictions—including European Union (EU) countries—disallow their sale. The United States of America (USA) began manufacturing snus in the late 1990s; prevalence studies suggest snus has risen in popularity in recent years.[9] By contrast, chewing tobacco has long been part of the tobacco market in the USA and is also legal in the EU; unlike snus, it causes copious salivation, requiring users to spit out excess.

Since about 2009, a new generation of tobacco-free ONPs, including nicotine pouches and

dissolvable "pearls", has emerged. These products contain nicotine, either synthetic or extracted from tobacco, though not tobacco itself. As a result, the harm profile of these products is likely to differ from tobacco products, though recent analyses detected carcinogens (tobacco-specific nitrosamines) in nicotine pouches that are present in tobacco leaf.[10]

Tobacco companies have seen tobacco-free ONPs as an opportunity to diversify their product range and now own major ONP brands: British American Tobacco owns Lyft and Velo, while Swedish Match, a subsidiary of Philip Morris International, owns ZYN. Like vaping products, tobacco-free ONPs are addictive and come in varied appealing flavours and, as we discuss below, their design and packaging resonate strongly with young people.[11] Prevalence studies suggest tobacco-free nicotine products have risen in popularity internationally;[9] while overall prevalence in some countries remains low, researchers have recommended close monitoring of future usage patterns.[12]

Can smokeless tobacco and ONPs help people stop smoking?

The health risks of tobacco, such as cancer, vary according to the tobacco product used. While snus is considered less physically harmful than cigarette smoking,[13] its role in helping people stop smoking is less clear. For example, a recent meta-analysis of randomised controlled trials concluded snus use did not significantly increase smoking cessation when compared to nicotine-free conditions.[14] Furthermore, this review outlined concerns about the quality of longitudinal and cross-sectional studies that reported associations between snus use and smoking cessation.[14] These findings highlight the need for independent and robust research assessing the role smokeless tobacco may play in supporting movement away from smoked tobacco products.

The recency of tobacco-free ONPs means evidence is even more limited. Pharmacokinetic studies suggest tobacco-free ONPs may reduce nicotine cravings[15,16] and a pilot study found ONPs may reduce the average number of cigarettes smoked per day, though were less effective than electronic cigarettes (vapes).[17] However, adequately powered, robust and independent randomised controlled trials are needed to assess whether ONPs lead to improved smoking cessation or maladaptive outcomes, such as sustained dual use. Prospective studies of young people who do not smoke are urgently required to assess how ONPs affect physical and mental health, and subsequent smoked tobacco use. Emerging USA research suggests oral nicotine pouch use is motivated by available flavours and is associated with nicotine addiction and other adverse outcomes.[18]

How could ONPs appeal to young people who do not smoke?

Aotearoa New Zealand's experience with vaping, which has harmed the wellbeing of young people,[19,20] makes it imperative that ONP regulations protect young people, who have a right to be free from the burden nicotine addiction imposes.[21] Strategy documents from British American Tobacco outline their "poly use" and "additive" marketing strategy, which aims to offer nicotine products for all occasions and user groups.[22] The strategy shows that tobacco companies view new nicotine products as an opportunity to recruit new customers, rather than to help people switch from smoking; young people are both the most profitable and most vulnerable group to recruit.

Promotion of ONPs (including via online "influencers") indicates these will have high appeal to young people—particularly if, as tobacco companies have lobbied,[23] these are made widely available. International promotions feature ONPs' "tobacco-free" status;[24] studies have found this message reduces risk perceptions, which in turn increases young people's susceptibility to trial these products.[25] Furthermore, analyses of marketing claims show these emphasise "freedom", a concept antithetical to the risk of nicotine addiction, which product use poses.[26] Furthermore, advertising promotes use of these products in settings that do not allow smoking or vaping.[27]

While prospective studies are required to examine associations between advertising themes and exposure, usage susceptibility, trial and regular use, our experience with vaping supports a precautionary approach. Inadequate regulation and enforcement have seen Aotearoa New Zealand achieve the dubious distinction of having the highest rates of youth vaping in the world.[28] Among young people who vape daily, the proportion that has never smoked increased from 20% in 2019 to 40% in 2023.[29] Young Māori have borne a heavier burden from vaping addiction than their NZ European/Other peers, which

suggests poor regulation of new nicotine products risks compounding health inequities. Evidence that ONPs are already being sold in Aotearoa New Zealand and marketed using youthful actors and appeals (e.g., inviting people to experience the "Zyngle", i.e., tingling usage sensation),[26,30] suggests regulators are already failing to keep pace with market developments. Ongoing uncertainty about these products' safety and efficacy, the lack of a clear rationale for their introduction (given the existence of approved oral NRT products) and international evidence of rising ONP use among young people indicate rapid action is required to avoid another regulatory failure.

COMPETING INTERESTS
None to declare.

AUTHOR INFORMATION
Jude Ball: Senior Research Fellow, Department of Public Health, University of Otago.
Janine Nip: Research Fellow, Department of Public Health, University of Otago.
Janet Hoek: Professor, Department of Public Health, University of Otago.

CORRESPONDING AUTHOR
Jude Ball: Senior Research Fellow, Department of Public Health, University of Otago, PO Box 7343, Wellington South, 4242, New Zealand. E: jude.ball@otago.ac.nz

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Intensive management from diagnosis improves HbA1c at 12 months post-diagnosis: results from a prospective cohort study in children with newly diagnosed type 1 diabetes

Caroline Griffin, Erin Roxburgh, Neil Owens, Olivia Sanders, Sharon Walsh, Chloe Hudson, Janet Ferguson, Karen MacKenzie, Martin de Bock

ABSTRACT

AIMS: To examine the impact of intensive management of type 1 diabetes (T1D) from diagnosis on HbA_{1c} 12 months from diagnosis.

METHODS: HbA_{1c} measured 12 months after diagnosis for 70 consecutively newly diagnosed children with T1D following implementation of an intensive management protocol was compared with 70 children consecutively diagnosed immediately pre-implementation. Intensive management involved carbohydrate counting and flexible insulin dosing from first meal with subcutaneous insulin, targeted blood glucose levels from 4–8mmol/L irrespective of time of day, avoidance of twice daily insulin regimen and promotion of continuous glucose monitoring (CGM). HbA_{1c}, diabetes technology use and insulin regimen at 12 months post-diagnosis were compared.

RESULTS: The post-intensive management implementation cohort had an improved mean HbA_{1c} of 58.2±15.3mmol/mol vs 63.7±10.7mmol/mol at 12 months (p=0.014). The proportion of young people with diabetes meeting a target HbA_{1c} of <53mmol/mol at 12 months improved from 11% to 40% (p=<0.001). There was a reduction of twice daily insulin regimen from 66% to 11% (p=<0.001), and increased CGM use from 57% to 76% (p=0.02).

CONCLUSION: Intensive management when implemented with consistent messaging from the multi-disciplinary team resulted in clinic-wide improvements in HbA_{1c} and the proportion meeting HbA_{1c} targets.

Type 1 diabetes (T1D) is a demanding, life-long journey for affected people and their caregivers. Management is aimed at reducing long-term complications while avoiding episodes of hypoglycaemia. The landmark Diabetes Control and Complications Trial (DCCT) has shown that an intensive insulin regimen with multidisciplinary team support is the most effective way of achieving this for both microvascular and macrovascular complications of T1D.[1] As set out in the International Society for Paediatric and Adolescent Diabetes (ISPAD) clinical practice guidelines from 2022, the target HbA_{1c} for young people with diabetes is <53 mmol/mol (<7.0%).[2] However, two recent Australasian studies have demonstrated widespread and persistent sub-optimal glycaemic control, with only 27% of children and 12.3% of adolescents achieving the recommended HbA_{1c} levels.[3,4]

There is evidence that it is important to establish glycaemic control early and that there is a window of opportunity at the time of diagnosis to optimise this control. This is because the trajectory of patient HbA_{1c} typically decreases over the first 5 to 6 months post-diagnosis, and then rises to a steady state around 12–18 months.[5,6] Subsequently, an individual's long-term HbA_{1c} trend rarely alters beyond 5 years post-diagnosis.[7] It is possible, therefore, that intensive management in the first 6 months following diagnosis could have a long-term impact on glycaemic outcomes.

Despite this finding, and the well-established efficacy of intensive management in T1D, there is still some variation in the approach from diagnosis. A survey of 100 clinicians based in Australia (69%) and Aotearoa New Zealand, which examined current clinical practice with regard to insulin regimen for children newly diagnosed with T1D, demonstrated a lack of consensus regarding starting regimen and dosing.[8] It was found that the implementation of an intensive regimen from diagnosis was less commonly opted for in Aotearoa New Zealand.

In July 2018, Christchurch Hospital implemented a protocol for intensive management of newly diagnosed T1D children <16 years. Prior to this no protocol existed, which resulted in differing approaches for insulin regimen, and the majority of those newly diagnosed were discharged on a twice daily insulin regimen. This protocol included carbohydrate counting from first meal, limiting snacks, flexible insulin dosing from first meal on subcutaneous insulin, avoidance of twice daily insulin regimen, targeted blood glucose levels from 4–8mmol/L irrespective of time of day, and corrections of blood glucose >12mmol/L while on injections between meals. The use of continuous glucose monitoring (CGM) technology was promoted. This study aimed to report the impact of the intensive management protocol at diagnosis on glycaemic control and management strategies 12 months after diagnosis compared to a historical cohort.

Methods

All newly diagnosed patients living in the Christchurch and West Coast Districts aged under 16 years old with T1D were treated in accordance with the new intensive-management protocol from 1 July 2018. T1D was defined as per the International Society of Pediatric and Adolescent Diabetes consensus statement.[9] The protocol consisted of a) carbohydrate counting from the first meal post-diagnosis, b) flexible subcutaneous insulin dosing from first meal, c) multi-daily injection (MDI) regimen d) targeted blood glucose levels from 4–8mmol/L irrespective of time of day, and e) corrections of blood glucose >12mmol/L (see Appendix 1).

Prior to and immediately after implementing the protocol, in-services for the ward staff were regularly given at nursing handovers to ensure the change in management was widely known and understood. This was to ensure that all healthcare professionals involved with newly diagnosed children and adolescents with diabetes delivered a consistent message.

This retrospective analysis from a prospectively recorded database analysed the first 70 consecutive young people diagnosed post-protocol implementation (enrolled from 1 July 2018 to 8 November 2020) and compared their HbA_{1c} at 12 months with the equivalent data from the last 70 consecutive people diagnosed immediately prior to the introduction of the new intensive-management protocol (diagnosed between 21 December 2015 and June 30 2018). Data that were collected for both groups included demographic data (age at diagnosis and prioritised ethnicity), presence and severity of diabetic ketoacidosis (DKA) at diagnosis, initial hospital stay duration, insulin regimen at 12 months post-diagnosis, use of CGM at 12 months and HbA_{1c} at 12 months post-diagnosis.

The MDI regimen was made up of a regular daily basal dose of long-acting insulin (glargine) together with multiple daily injections of rapid-acting insulin (insulin aspart) calculated from the patient's carbohydrate intake. The starting basal long-acting insulin dose was calculated using a starting value of 0.5x0.75–1.0U/kg. The rapid-acting doses were calculated in accordance with the practice of "carbohydrate counting", which combines standard carbohydrate to insulin ratios (CHO ratios) (calculated initially using the "500 rule", i.e., divide 500 by the total daily insulin dose to find the amount of carbohydrates in grams that 1 unit of rapid-acting insulin will cover). The CHO ratio calculation was adjusted for toddlers (<5 years) using 250 as the numerator rather than 500.[10–12] Insulin sensitivity factor (ISF) was defined using the 100 rule (divide 100 by the total daily insulin dose [0.75–1.0U/kg]). All calculations were reviewed daily by the inpatient care team, and then daily following discharge until glucose stability as per discretion of the diabetes educators.

In order for dosing ratios and carbohydrate counting to be implemented for inpatients, a new fully carbohydrate-counted menu was developed through the in-house catering service at Christchurch Hospital. This menu featured standard hospital breakfast and hot dinner options, while lunch was modelled on a "lunch box" with options for sandwiches, fruit, yoghurt and snacks. Between meals, snacks were reduced from 3 times daily to 2 times daily, eliminating a supper snack. Morning and afternoon tea snacks were further limited to <15g carbohydrates. For all food provided, the total amount of carbohydrates was calculated and declared on the menu to allow families to accurately begin carbohydrate counting. An important consideration was to advise families against providing extra food between these times.

Education took place over the inpatient admission, with a number of modules delivered by diabetes nurse educators and dieticians. As well as education regarding insulin administration, carbohydrate counting and carbohydrate-free foods, these sessions promoted CGM and the benefits of its

being initiated prior to discharge. Because CGM is not funded in Aotearoa New Zealand, social workers were closely involved and an application for the Child Disability Allowance was completed for each patient, which partially offset the cost of accessing CGM.

Following discharge, apart from daily phone contact, newly diagnosed families were seen in-clinic 2 weeks after diagnosis, and again 1 month later before entering into the routine 3-monthly follow-up.

In comparison, prior to the implementation of the protocol, there were inconsistent approaches at diagnosis. Specifically, insulin regimen was chosen *ad hoc*, there was no carbohydrate counting, hospital-provided meals were not carbohydrate counted, messaging on glucose targets was variable and promotion of CGM was inconsistent. However, all other educational modules were unchanged, as was the follow-up frequency after discharge.

The audit activity of this study was covered by "Clinical benchmarking utilising data from New Zealand Diabetes Centre Patient Management Systems"; Ethics Committee reference number HD18/098. Patient data are collected under a waiver of consent. Data collection was supported from a research grant provided by the Canterbury Medical Research Foundation.

A total of 70 in each cohort provided over 80% power to detect a moderate effect size of 0.5 with a two-sided alpha of 0.05. Assuming a HbA_{1c} standard deviation of 20mmol/mol[3] R, this would be a difference in HbA_{1c} of 10 mmol/mol between the two cohorts. Cohort characteristics were summarised by treatment group as counts (percentages) for categorical variables and as means and standard deviations (SD) or medians and interquartile ranges (IQR) for continuous normally or skewed variables respectively. Differences between groups were initially assessed using unadjusted tests (Student unpaired *t*-Test for HbA_{1c} and Pearson's Chi-squared test for categorical outcomes). Next, linear regression was used to estimate group differences in HbA_{1c} while firstly adjusting for the potential baseline confounders of non-European ethnicity and DKA at diagnosis, and secondly investigating the relative importance of use of CGM and insulin regimen at 12 months as effect modifiers.

Results

Table 1 describes the demographics of the two consecutive cohorts. The two cohorts were similarly matched, except for the post-intervention group being slightly older, a higher proportion having Māori ethnicity and a higher proportion presenting with DKA. All of the second cohort were educated with the intensive-management protocol, without exception.

Table 2 shows the 12-month data post-diagnosis of the two cohorts; the post-intensive-management cohort had an improved mean HbA_{1c} of 58.2±15.3mmol/L at 12 months, compared to 63.7±10.7mmol/mol in the historical group (p=0.014). As expected, there were notable differences in management modalities at 12 months post-diagnosis between the two cohorts, with near elimination of the twice daily insulin regimen—this being replaced by multi-daily injections—and an increased uptake of CGM (75% in cohort 2 vs 57% in cohort 1).

In order to assess which variables contributed to this improvement in HbA_{1c}, further analyses were undertaken. Firstly, we adjusted for baseline characteristics (non-European ethnicity and DKA at diagnoses were assumed as a predictor for higher HbA_{1c}). This showed the mean (95% confidence interval [CI]) difference between the two groups was now 7.3mmol/mol (95% CI 3.2–11, p<0.001), favouring the second cohort, which suggests that the changes in management more than overcame the predictive association of a poorer HbA_{1c} by ethnicity and DKA at diagnosis. We then adjusted for CGM use. This showed the mean (95% CI) difference between cohorts was 5.6 mmol/L (95% CI 1.5–9.6, p=0.007), favouring the second cohort, suggesting that the increased proportion of CGM use in cohort 2 had some impact on the overall difference, but did not explain all the difference. Similarly, adjusting for insulin regimen, the mean (95% CI) difference was 6.6 mmol/mol (95% CI 1.5–12, p=0.012) favouring cohort 2. These sequential analyses controlling for variables expected to predict outcome suggest the differences observed between two cohorts is multifactorial and not principally explained by either increased CGM use or insulin regime alone.

Discussion

Implementation of an intensive-management protocol from diagnosis in the management of children with T1D resulted in improved HbA_{1c} levels. This finding is not unexpected, with simi-

Table 1: Baseline characteristics of the two cohorts.

Characteristics	Cohort 1: pre-guidelines, n=70	Cohort 2: intensive, n=70
Gender	46% male	54% male
Median (IQR) age at diagnosis	9 (5–11) years	10 (8–12) years
Number (%) by prioritised ethnicity	NZ European, 63 (90%) Māori, 2 (3%) Pacific, 3 (4%) Other, 8 (11%)	NZ European, 56 (80%) Māori, 9 (13%) Pacific, 3 (4%) Other, 4 (6%)
Mean (SD) days in hospital during initial stay	3.3±1.3 days	3.3± 1.4 days
Mean (SD) number of clinics attended in first 12 months	5.7±1.2 clinics	5.5±1.0 clinics
Number (%) presenting with DKA† at diagnosis	23 (33%) 11 (16%) = severe‡ 10 (7%) = moderate‡ 1 (1%) = mild‡	28 (40%) 14 (20 %) = severe 11 (16%) = moderate 3 (4%) = mild

SD = standard deviation; DKA† = diabetic ketoacidosis; DKA‡ severity defined as severe if pH <7.0, moderate if 7.00–7.24 and mild if 7.25–7.30.

Table 2: Cohort comparison.

	Cohort 1: pre-guidelines, n=70	Cohort 2: intensive, n=70	
Number (%) by insulin regimen at 12 months	BD* 46 (66%) MDI† 16 (23%) CSII‡ 8 (11%)	BD 8 (11%) MDI 58 (83%) CSII 4 (6%)	p<0.001
Number (%) by use of rtCGM§ or isCGM§§ use at 12 months	40 (57%)	53 (75%)	p=0.020
Mean (SD) HbA_{1c} 12 months post-diagnosis	63.7±10.7 mmol/mol	58.3±15.3mmol/mol	p=0.014
Number (%) meeting target HbA_{1c} <53mmol/mol at 12 months	9 (13%)	31 (44%)	p<0.001

BD* = twice daily insulin regimen; MDI† = multi-daily injection insulin regimen; CSII‡ = insulin pump therapy; rtCGM§ = real-time continuous glucose monitoring; isCGM§§ = intermittently scanned continuous glucose monitoring.

lar results observed at the John Hunter Children's Hospital in Australia.[13] Further, international best-practice guidelines endorse intensive management from diagnosis.[2] Our experience demonstrates that translating this evidence-based approach is possible and effective.

Central to the change in practice was consistent messaging for the families coming from the whole team of healthcare professionals. Previous research has highlighted this is an important factor in influencing the success of management for adolescents.[14–16] For example, Swift et al. showed that adolescents tend to achieve lower HbA_{1c} targets at centres where there is a greater degree of agreement between health professionals in regard to these targets.[13] With the implementation of this protocol, a concerted effort was made to ensure we had a coordinated multidisciplinary team. Multiple ward in-services occurred both before and after implementation of the protocol in order to embed the change in practice. Consistent education was a key element of this messaging and, under this protocol, took place over the patients' initial admission at diagnosis. This inpatient model of education and information dissemination capitalises on the opportunity presented while patients and whānau (family) are present, engaged and have time to take information on board. Families were provided information about glucose targets, insulin dosing (insulin action where rapid-acting insulin is calculated according to carbohydrate intake and correction factors, importance of 15 minute pre-bolus), carbohydrate counting and the practicalities of administering insulin (for example, injection technique) prior to discharge. The multidisciplinary team (diabetes educator, endocrinologist and dietitian) are available at all subsequent outpatient appointments, and therefore there exists a system for ongoing education and reinforcement of management goals.

It is important to note that diabetes management is currently going through rapid evolution. With higher use of real-time CGM,[15] and with modern automated insulin delivery systems becoming increasingly prevalent within 12 months of diagnosis, there is great potential for even further improvements to be seen in the future. For example, Prahalad et al. showed that CGM from diagnosis results in sustained improved HbA_{1c}.[17] While our cohort had quite high rates of CGM use, most were using intermittently scanned rather than real-time CGM due to cost. It remains important for diabetes clinics in Aotearoa New Zealand to prepare for future improved access to these technologies and rapidly translate this to routine care as soon as possible in the patient journey from diagnosis.

Limitations of this study were that it was an audit, with a retrospective control arm, as opposed to a randomised control trial comparing the two interventions. Thus, is it possible that there are additional factors interacting to influence the results, especially as we were not able to delineate between real-time and intermittently scanned CGM, or the proportion in either cohort that had CGM applied at initial diagnoses (but can safely be assumed was higher in the second cohort) or total daily dose. The improved HbA_{1c} demonstrated is likely to reflect multiple factors, broadly reflecting adjusted education, insulin injection regimen, improving diabetes technology and consistent messaging from the clinical service. The second cohort was affected by COVID-19 lockdowns and some clinic appointments were made by video or telephone, and the impact of this has not been analysed. It should be highlighted that the cohort in the study was predominantly European, and results may not be generalisable to centres with different ethnic makeups. A strength of this study was the ability to collect a full dataset for each patient involved in the study thanks to the routine collection of data at admission and follow-up of patients who are diagnosed with T1D in Christchurch.

In conclusion, this study provides evidence to support the efficacy of intensive management from diagnosis for children with T1D and could be used as a model for other centres in Aotearoa New Zealand who are yet to deploy this evidence-based practice.

COMPETING INTERESTS
None to declare.

AUTHOR INFORMATION
Caroline Griffin: Department of Paediatrics, Te Whatu Ora, Waitaha, New Zealand.
Erin Roxburgh: Department of Paediatrics, University of Otago, Christchurch, New Zealand.
Neil Owens: Department of Paediatrics, Te Whatu Ora, Waitaha, New Zealand.
Olivia Sanders: Department of Paediatrics, Te Whatu Ora, Waitaha, New Zealand.
Sharon Walsh: Department of Paediatrics, Te Whatu Ora, Waitaha, New Zealand.
Chloe Hudson: Department of Paediatrics, Te Whatu Ora, Waitaha, New Zealand.
Janet Ferguson: Department of Paediatrics, Te Whatu Ora, Waitaha, New Zealand.
Karen MacKenzie: Department of Paediatrics, Te Whatu Ora, Waitaha, New Zealand.
Martin de Bock: Department of Paediatrics, Te Whatu Ora, Waitaha, New Zealand; Department of Paediatrics, University of Otago, Christchurch, New Zealand.

CORRESPONDING AUTHOR
Martin de Bock: Department of Paediatrics, Te Whatu Ora, Waitaha, New Zealand; Department of Paediatrics, University of Otago, Christchurch, New Zealand. E: martin.debock@otago.ac.nz

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Appendix 1

Hospital HealthPathways Waitaha | Canterbury

MedChart

Inpatient Management of Diabetes in Children

This pathway is about the inpatient management of patients with type 1 diabetes during their initial presentation (including mild diabetic ketoacidosis able to be managed with subcutaneous insulin), subsequent admissions for diabetes, or admissions for another condition. It is not about management of diabetic ketoacidosis requiring an insulin infusion, or the outpatient management of diabetes. See also Diabetic Ketoacidosis (DKA) in Children.

Background

About inpatient management of diabetes in children

About inpatient management of diabetes in children

Good glycaemic control from diagnosis predicts long-term blood glucose control, and may preserve beta-cell mass and prolong the honeymoon period. Consistent management and messaging from all staff involved in looking after the patient helps to achieve this.

Assessment

1. Ensure the patient is not in diabetic ketoacidosis as, if present, this needs to have resolved before subcutaneous insulin is started.
2. Check the patient's blood glucose level to assess for:
   - hypoglycaemia (blood glucose level less than 4.0 mmol/L) or
   - hyperglycaemia (blood glucose level greater than 12.0 mmol/L).

Management

1. Determine insulin dose:
   - Consider factors which can influence the patient's insulin requirement .

     Factors which can influence the patient's insulin requirement

     - Age
     - Body mass index
     - Presence of ketones
     - How early the patient presented

   - Determine the total daily insulin dose to use as a starting point .

     Total daily insulin dose to use as a starting point

     The starting point for most patients is 1 unit/kg/day. Any variation from this dose must be discussed with the senior medical officer (SMO) responsible for the patient (some children who are lean, newly diagnosed and young may only require 0.5 units/kg/day).

     When calculating the insulin dose:

     - Round down to the nearest whole unit of insulin for all patients aged 5 years or older.
     - Consider half units for patients younger than 5 years, with an insulin requirement less than 15 units/day.

2. Determine detail of the insulin dosing regime.
   - Use a multi-daily-injection (MDI) insulin regime .

     Multi-daily-injection (MDI) insulin regime

MDI insulin regimens are the best way of achieving optimal glycaemic control.

MDI insulin regimens involve a basal dose of Lantus, with fast acting insulin (Novorapid or Humalog) injected before meal times and to correct hyperglycaemia. All children should be started on this regimen at diagnosis.

- Calculate the Lantus basal insulin dose as 50% of the total daily insulin dose. Round down to the nearest half a unit.
- Prepare the following information which will be required to ⌄ determine the fast-acting insulin (Novorapid/Humalog) dosing :

Determine the fast acting insulin (Novorapid/Humalog) doses

The insulin dose is calculated as a combination of the carbohydrate ratio (the amount of insulin for the carbohydrate in the meal) and a correction for any hyperglycaemia (the amount of insulin required to return the glucose level back to target, known as insulin sensitivity factor). Avoid using the term sliding scale to patients, because it does not correspond to our education goal of learning to use carbohydrate ratios and insulin sensitivity.

  - ⌄ Carbohydrate ratio , which is used to cover the carbohydrate consumed.

Carbohydrate ratio

- The carbohydrate ratio specifies how many grams of carbohydrate a single unit of insulin will cover in a meal. For example, for a child with a carbohydrate ratio of 1 to 10, one unit of insulin will cover 10 g of carbohydrate.
- The carbohydrate ratio is initially calculated as 1 unit of insulin for x grams of carbohydrate, where $x = 500 \div$ total daily insulin dose. This is conservative, and will often need to be made more aggressive. While in hospital, children with type 1 diabetes will have a menu provided with carbohydrate amounts.

  Case example – A 50 kg child with total daily insulin requirements of 1 unit/kg/day requires 50 units/day. The carbohydrate ratio is then 1 to 10 (1 unit of insulin for every $500 \div 50 = 10$ g of carbohydrate). Therefore if the child eats a 50 g carbohydrate meal, they will need to inject 5 units of insulin to cover this.

- Children aged younger than 4 years need a carbohydrate ratio that is stronger with respect to their weight. They will often need it calculated as 250 ÷ total daily dose. Discuss with the endocrinologist.

  Case example – A 10 kg child with total daily insulin requirements of 1 unit/kg/day requires 10 units/day. The carbohydrate ratio is then 1 to 25 (1 unit for every 250 ÷ 10 = 25 g of carbohydrate). Therefore if the child eats a 50 g carbohydrate meal, they will need to inject 2 units of insulin to cover this.

- Insulin sensitivity factor (ISF) , which is used to correct hyperglycaemia.

Insulin sensitivity factor

The insulin sensitivity factor is used for correcting hyperglycaemia. It specifies by how much 1 unit of insulin will decrease the blood glucose level in mmol/L.

The insulin sensitivity factor is calculated as 1 unit to reduce the blood glucose by x mmol/L, where x = 100 ÷ total daily dose.

Case example – A 50 kg child, with total daily insulin requirements 1 unit/kg/day requires 50 units/day. The insulin sensitivity factor is 1 in 100 ÷ 50 = 1 to 2 (1 unit will reduce the glucose level by 2 mmol/L within 3 hours). The glucose target is 6 mmol/L irrespective of the time of day or night. Therefore if the child has a blood glucose level of 12 mmol/L, they will need to inject 3 units of insulin to bring their blood glucose level back down to 6 mmol/L.

- Document both values in the Cortex, using the Paediatric Diabetes Clinical Summary.
- Generate a personalised insulin dose grid . Recalculate this grid daily, based on feedback from the Diabetes Team (Nurse Educators or Endocrinologists).

Generate a personalised insulin dose grid

Open the spreadsheet used to calculate personalised insulin doses and follow the instruction on the spreadsheet for calculating, printing, and saving the grid. For children aged 4 years and over, use the full unit grid , and for children aged younger than 4 years, use the half unit grid .

> For the first grid of the admission, use the carbohydrate ratio and insulin sensitivity factor based on the instructions above. The target blood glucose level is always 6 mmol/L. The first grid is a starting point, and subsequent grids may be adjusted depending on the patient's blood glucose profile.
>
> 1. Save a copy of the grid by using "Save as" and making the file name *Lastname_Firstname_NHI_DD.MM.YR* and saving to the location *G:\Division\PAE\COMMON\Diabetes\Medchart\Patients*
> 2. After the grid is printed add a patient label, add your name and signature, and the date, and place in the front of the patient's notes. Discard any previous grids.

3. Prescribe insulin:
   - Prescribing Lantus:
     - Prescribe Lantus before dinner at 5.30 pm.
     - The first dose can be given any time between pre-dinner and midnight. However, if the patient finishes their insulin infusion before breakfast, give half the calculated Lantus dose with breakfast, and the full calculated Lantus dose pre-dinner that evening.
   - Prescribing Novorapid/Humalog for meals

> **Prescribing Novorapid/Humalog for meals**
>
> - Make sure there is an up-to-date personalised insulin dose grid
> - In Medchart:
>   - Choose the insulin to be administered (Novorapid or Humalog) .
>
> > **Choose the insulin to be administered (Novorapid or Humalog)**
> >
> > These are equivalent. Choose based on what is available on the ward (usually Novorapid), or what the patient takes at home if they have brought their own insulin to hospital.
>
>   - Chart a dose range, which should be from 0 to the highest insulin dose on the patient's personalised insulin dose grid.

- Prescribe as a scheduled medicine and choose the mealtime the insulin is for from the dropdown box labelled Schedule. There is no option for afternoon tea, so pick once daily and write Afternoon Tea in the Qualifier box.
- Record the current carbohydrate ratio and the insulin sensitivity factor in the qualifier box.
- Make sure there is a separate prescription for each of breakfast, lunch, afternoon tea, and dinner.
- For the afternoon tea dosing, use the carbohydrate ratio only, i.e. use the top line of the grid to determine what insulin dose range to chart.

- Prescribing Novorapid/Humalog for corrections

Prescribing Novorapid/Humalog for corrections

- Don't give additional corrections that are not part of pre-meal insulin unless the last Novorapid/Humalog dose administered was at least 3 hours beforehand.
- In Medchart:
  - Choose the insulin to be administered (Novorapid or Humalog) .
  - Chart a dose range, which should be from 0 to the highest insulin dose in the zero carbohydrate column of the patient's personalised insulin dose grid. Check that the target blood glucose level on the grid is 6 mmol/L.
  - Prescribe as an as required (PRN) medicine.
  - Record the current insulin sensitivity factor in the qualifier box.
  - The clinical nurse specialist (CNS) or registrar must confirm the correction dose, according to the insulin sensitivity factor (ISF) that has been prescribed.

4. Administer insulin at mealtimes:
   - Calculate the insulin dose based on the amount of carbohydrates that will be consumed and the pre-meal blood glucose, involve the family and make reference to the patient's personalised insulin dose grid.

Amount of carbohydrates that will be consumed

> As all food should be carbohydrate counted, the kitchen will provide specifically designed day meals and snacks, labelled with carbohydrate amount. Dinner meals will be delivered according to the normal menu.
>
> Advise families not to provide extra food between meals, as it will not be covered appropriately with the insulin prescribed.

- Give short-acting insulin (Novorapid/Humalog) 15 to 30 minutes before the meal.
- Use an insulin pen to administer all subcutaneous insulin. Avoid insulin syringes and mixing different insulins. 6 mm and 8 mm pen needles are suitable for most children and adolescents respectively.

5. Advise the patient and family on food intake .

> **Advise the patient and family on food intake**
>
> Ensure patients with diabetes:
>
> - have three main meals.
> - limit snacks between main meals. Morning tea and afternoon tea should contain less than 15 g of carbohydrate. Older adolescents may be an exception to this at afternoon tea. An extra insulin dose will be required if more than 15 g of carbohydrate is eaten at that point.
> - avoid supper (i.e., no further meals after dinner, and snacks must be free from carbohydrate). There is no insulin prescribed to cover late night food, and will result in overnight hyperglycaemia.
> - strictly avoid all sugar-containing carbonated drinks, fruit juice, and lollies. Potato chips and other high fat snacks should be highly discouraged.
>
> Ensure all food intake is recorded by the nurse on the fluid balance chart, documenting the carbohydrate intake.

6. Monitor blood glucose – The blood glucose target range for any patient with type 1 diabetes is 4.0 to 8.0 mmol/L:
   - If the patient has a continuous glucose monitor and the blood glucose level is 4 to 15 mmol/L, use this for blood glucose monitoring. Otherwise, take a capillary blood glucose measurement by finger prick.
   - Once out of diabetic ketoacidosis (DKA), and on regular subcutaneous insulin, monitor glucose in all patients at the following times:

- Before breakfast
- Three hours after breakfast time rapid acting insulin
- Lunch
- Three hours after lunchtime rapid acting insulin
- Before dinner
- Before bed (9.00 pm at the latest)
- Midnight
- 4.00 am
- At any time the patient is symptomatic for hypoglycaemia.

7. Monitor blood ketones:
   - At admission and then whenever measuring blood glucose until ketone level less than 0.5 mmol/L for more than 6 hours. This information is used by the diabetes team to determine whether any changes to overall diabetes management are required.
   - Whenever blood glucose level is greater or equal to 12 mmol/L on two consecutive readings taken at least 3 hours apart.
8. Manage hypoglycaemia and hyperglycaemia .

Manage hypoglycaemia and hyperglycaemia

Hypoglycaemia – Treat hypoglycaemia (BSL less than 4.0 mmol/L) according to the Hypoglycaemia in Children pathway.

Hyperglycaemia:

- Blood glucose level greater than 12 mmol/L:
  - Daytime – Use the patient's personalised insulin grid to correct at main mealtimes.
  - Night-time – Give a correction using the short-acting insulin that has been prescribed for as required administration, but only if the last short-acting insulin was given more than 3 hours ago. Use the zero carbohydrate column on the personalised insulin grid to determine how much insulin to give according to the blood glucose level.

- Blood glucose level greater than or equal to 12 mmol/L on 2 consecutive readings taken 3 hours apart – Check ketones:
  - If blood ketone level is less than 1 mmol/L, manage as for blood glucose level greater than 12 mmol/L.
  - If blood ketone level is greater or equal to 1 mmol/L, manage as for blood glucose level greater than 12 mmol/L but give 1.5 times the calculated correction dose of insulin. Optimise fluid intake as this can help clear ketones.
- If you are unsure about how much insulin to administer, seek advice from a senior colleague or registrar.

9. Make arrangements for discharge:
   - Ensure diabetes education, if required, has taken place.
   - Request follow-up as directed by endocrinology using the Cortex Paediatric Follow-up Order.

   Prescription of outpatient medications, where required, will be done by the diabetes team.

PARALLEL PAGES

Diabetes Diagnosis in Children

SOURCES

CONTRIBUTORS

NAME	PROFESSIONAL ROLE	SPECIALISATION	ORGANISATION	ROLE IN PATHWAY
Michael Ardagh	Medical Specialist	Emergency Medicine	Te Whatu Ora Waitaha Canterbury	Clinical Editor, Responsible for Approval
Clare Doocey	Medical Specialist	Paediatric Medicine	CDHB- Child Health	Clinical Director, Responsible for Approval
John Garrett	Medical Specialist	Paediatric Medicine	Canterbury & West Coast DHB	Clinical Editor

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Exploring training, involvement and confidence: a study of healthcare professionals in decision-making capacity assessments

Nicola Hickling, Clare M McCann, Lynette Tippett, Gary Cheung

ABSTRACT

AIM: To explore the training, involvement and confidence of healthcare professionals involved in decision-making capacity (DMC) assessments, and to compare any differences between those conducting and those involved in, but not conducting DMC assessments.

METHOD: A 10-minute anonymous, online survey was conducted with both closed and open questions. A total of 78 participants completed the survey.

RESULTS: Training was lacking in quantity and adequacy. Only 14.1% received formal training during and post their qualification and only 38.5% reported the right amount of training. Just over 55% reported having the right amount of involvement, with 18% having too much and 27% having not enough involvement. A significantly higher response was given for having too much involvement by those conducting DMC assessments (p=0.006), while those not conducting felt they do not have enough involvement (p<0.001).
Only 25.6% (n=20) were very confident in being able to explain DMC to a patient.

CONCLUSIONS: Healthcare professionals working in this area urgently require support in the form of formal training and defined roles. Given what can be at stake for an individual undergoing a DMC assessment, it is imperative that improvements are made to upskill the workforce and utilise expertise of all healthcare professionals.

Decision-making capacity (DMC) assessment is a complex task that requires both clinical skills and knowledge of legal and ethical bounds.[1] DMC is legally measured by the ability to understand the nature and purpose of a decision, retain relevant information for the required time, use or weigh this information as part of a reasoning process, including consequential thinking, and communicate their decision.[2] DMC assessments can vary in depth substantially.[3] They can take the form of informal and formal assessments.[4] Informal assessments occur frequently within the process of gaining informed consent for treatment, while formal assessments occur following a trigger that puts an individual's DMC into question.[2] An opinion is then required under the *Protection of Personal and Property Rights Act (PPPR) 1998* to support legal proceedings such as the activation of enduring power of attorney (EPOA) or an application in the family court.[2]

The demand for DMC assessments is likely to rise in an ageing world,[5] with corresponding increases in neurodegenerative diseases and the passing of assisted dying laws.[6,7] A highly skilled and knowledgeable healthcare workforce is required to meet this demand. However, previous research has highlighted a lack of training and knowledge among healthcare professionals involved,[8–11] and confusion around who is best placed to conduct these assessments.[10,11] As reported in a New Zealand-based qualitative study, none of the 12 general practitioners (GPs) who participated had received formal undergraduate training in DMC assessments and many lacked confidence in conducting these assessments.[11] In addition, 19% of GPs and 18% of hospital doctors who completed a New Zealand survey incorrectly answered the question on what to do when a patient lacks capacity.[10] Alam et al. found in a qualitative study in Australia that most GPs struggled to identify whether a patient with dementia was competent to make the decision in question.[8] Additionally, Lamont et al. concluded from a survey involving healthcare professionals of multiple disciplines that there is a lack of understanding that capacity is a legal construct, and knowledge gaps were found in understanding the legislative frameworks.[9] There is also disagreement and confusion around *who* can and should assess capacity. Some studies found GPs mostly considered DMC assessments to be part of their

responsibility due to their ongoing relationship with the individual.[11] Conversely, it has been found that 24% of GPs and 30% of hospital doctors did *not* believe it was their responsibility to conduct DMC assessments.[10] Involvement of other healthcare professions appears to be varied. Recent studies have highlighted the contribution of occupational therapists and social workers in DCM assessments,[12,13] but it was nearly 10 years ago when research was conducted to explore the roles of clinical psychologists/neuropsychologists[14,15] and speech-language pathologists.[16] In some jurisdictions, social workers and speech-language therapists are recognised for undertaking DMC assessments, for example under the *Mental Capacity Act 2005* in England and Wales.[17] Allied health professionals have a valuable contribution to make in DMC assessments; however, it is unclear how often and to what extent each discipline is involved.

In New Zealand, formal DMC assessments are within the scope of all doctors.[10] Clinical psychologists and neuropsychologists can also complete formal DMC assessments,[18] and more recently, nurse practitioners have a range of formal assessments included in their scope of practice.[19] Clinical neuropsychologists are often involved in more complex, formal assessments where a more in-depth assessment is required.[3] These assessments usually consist of objective testing from different sources of information and clinical judgement.[3] Nurses and allied health professionals (e.g., social workers, occupational therapists, speech-language therapists) are often involved in, or contribute to, DMC assessment as part of their clinical role.[19] However, the Australasian literature on DMC assessment by non-medical health professionals is very limited.[20]

The aim of the current study was to explore whether there are any differences in the *training*, *involvement* and *confidence* between healthcare professionals involved in DMC assessments. A second aim was to compare the differences between healthcare professionals conducting DMC assessments and those involved, but not formally conducting them. The findings could also uncover the role and training needs of multidisciplinary healthcare professionals in DMC assessment. The survey also included questions on how healthcare professionals are conducting

Table 1: List of organisations included for distribution of survey.

Type of organisation	Organisation name
Professional colleges	The Royal New Zealand College of General Practitioners
	The Royal Australian and New Zealand College of Psychiatrists (sent to New Zealand members only)
	New Zealand College of Clinical Psychologists
Associations	Nurse Practitioners New Zealand
	New Zealand Speech-language Therapists' Association
	Occupational Therapy New Zealand
	Aotearoa New Zealand Association of Social Workers (ANZASW)
	New Zealand Special Interest Group in Neuropsychology (NZ SIGN)
	New Zealand Psychological Society
Private/community organisations	Age Concern
	Dementia Auckland/Wellington/Canterbury
	Alzheimers New Zealand
	Third Age Health

DMC assessments, but the results will be presented in a separate publication due to the large volume of data.

Methods

Survey design

The survey was developed by the first author following a comprehensive review of relevant literature and detailed discussions with the other three authors around key topics to include. The draft survey was discussed until a consensus was reached on the questions and flow. The survey questions are listed in Table 2.

A descriptive cross-sectional anonymous survey was designed and created through Qualtrics^{XM} (a web-based survey tool). Data were collected between January 2022–April 2022. Ethics approval was granted from The University of Auckland Human Participants Ethics Committee (UAHPEC: 23678). Upon completion of the survey, participants were given information about a second stage of the research that involved training in DCM assessment and qualitative interviews, and if interested they could provide their contact details for that. Results of the second stage of the research will be presented in a separate publication.

Participants

Eligibility and inclusion involved self-reported positive responses to three screening statements; a healthcare professional in Aotearoa New Zealand involved with DMC assessments, have read and understood the information describing the study in the participant information sheet (PIS) and consent to participate in the survey as detailed in the PIS. Participants were recruited via a number of organisations shown in Table 1, with the use of monthly newsletters, generic emails or specific member-only emails.

Data analysis

Anonymised data were downloaded from Qualtrics into Microsoft Excel (2022) and descriptive

Table 2: Survey questions reported by healthcare professionals and the response codes.

Topic	Responses	Re-coding for analysis
Training		
Which of the following best describes the training you have completed to perform your current role in the assessment of a patient's decision-making capacity?	A. Formal training during my qualification B. Formal training post qualification C. Informal/on-the-job training D. No training	1 = A 2 = B 3 = C 4 = D
How would you rate the amount of training you have received in training you to perform your current role in the assessment of a patient's decision-making capacity?	A. Far too much training B. Too much training C. The right amount of training D. Too little training E. Far too little training	1 = A & B 2 = C 3 = D & E
How adequate was the training you have received in preparing you to perform your current role in the assessment of a patient's decision-making capacity?	A. Very adequate B. Somewhat adequate C. Not very adequate D. Not adequate at all	1 = A 2 = B 3 = C 4 = D
Please explain the reasons for your answer on the adequacy of training you have received to perform your current role	N/A Open ended	

Table 2 (continued): Survey questions reported by healthcare professionals and the response codes.

Which of the following best describes your knowledge of the Goodfellow Unit Capacity Assessment training*?	A. Completed both modules B. Completed one of the modules C. Aware of it and intending on completing it D. Aware of it but not intending to complete it E. I have not heard of this training before	1 = A & B 2 = C & D 3 = E
Involvement		
How would you rate your current level of involvement in the assessment of a patient's decision-making capacity?	A. Far too much involvement B. Slightly too much involvement C. The right amount of involvement D. Not quite enough involvement E. Not at all enough involvement	1 = A & B 2 = C 3 = D & E
Please explain the reasons for your answer	N/A Open ended	
Confidence		
How do you rate your confidence in performing your current role(s) in the assessment of a patient's decision-making capacity?	A. Very confident B. Quite confident C. Not very confident D. Not at all confident	1 = A 2 = B 3 = C 4 = D
How confident would you be to describe decision-making capacity to a patient requiring an assessment?		
How would you describe decision-making capacity to a patient requiring an assessment?	N/A Open ended	

*An online training consisting of two modules on the principles and requirements of capacity assessment, available from: https://www.goodfellowunit.org/courses/assessing-decision-making-capacity-clinical-basics.

analysis was undertaken at a total sample and individual profession level. Participants were classified into either Group one: healthcare professionals conducting DMC assessments (medical practitioners, nurse practitioners and clinical psychologists/neuropsychologists), herein referred to as the "conducting" group, or Group two: healthcare professionals involved in, but not conducting, DMC assessments (social workers, occupational therapists and speech-language therapists, nurses), herein referred to as the "contributing to" group. Data were entered into IBM SPSS Statistics for Windows, Version 29[21] for statistical analysis. Fisher's exact tests were used to determine any significant difference between the two groups (significance was set at 5%). Responses to the open-ended questions were analysed using inductive content analysis as informed by Elo and Kyngas[22] and are presented alongside the quantitative data, where appropriate.

Results

Given the nature of the survey distribution and advertisement we are unable to calculate a response rate. Of the 171 participants who agreed

Table 3: Participant demographic characteristics.

Characteristics	Response	N=78 n (%)
Gender	Male	13 (16.7)
	Female	65 (83.3)
Age	Under 30 years	7 (9.0)
	30–44 years	21 (26.9)
	45–55 years	23 (29.5)
	Over 55 years	27 (34.6)
Ethnicity	European	69 (88.5)
	Māori	6 (7.7)
	Asian	4 (5.1)
	Other	2 (2.6)
	Prefer not to say	1 (1.3)
Profession	Medical practitioner	25 (32.1)
	Clinical psychologist/ neuropsychologist*	12 (15.4)
	Social worker	12 (15.4)
	Occupational therapist	11 (14.1)
	Nurse practitioner	10 (13.8)
	Speech-language therapist	4 (5.1)
	Other	4 (5.1)
DMC assessment role	Conducting DMC assessments	47 (60.3)
	Contributing to DMC assessments	31 (39.7)
Years of professional experience	Less than 6 years	13 (16.7)
	6–10 years	13 (16.7)
	11–20 years	20 (25.6)
	Over 20 years	32 (41.0)
Work setting	Public hospital	46 (59.0)
	Private practice (group/solo)	12 (15.4)
	Other	20 (25.6)

*All psychologists held the neuropsychology scope of practice; 4 of the 12 also stated holding the clinical psychology scope of practice.
DMC=decision-making capacity.

to the three initial screening statements, 125 (73.1%) remained after the first content question, 118 (69%) after the second question and 78 (45.6%) went on to complete the survey, resulting in a 45.6% completion rate. We only analysed the results of these 78 participants. Table 3 summarises the participant demographics. Of the 25 medical practitioners who completed the survey, there were five (20.0%) GPs, five (20.0%) geriatricians and four (16.0%) psychiatrists, with the remaining medical practitioners from a broad range of specialties. Public hospital (n=46, 59.0%) and private practice (n=12, 15.4%) were the most common workplace settings; "other" settings included university/polytechnic, government department/agency, non-government organisations (NGOs), Kaupapa Māori non-government organisation, primary care, aged care and commercial companies. The majority (66.7%, n=52) had worked in their profession for over 10 years.

Training

Format

Table 4 shows that training is generally lacking among our survey participants. Only 14.1% (n=11) reported receiving formal training during *and* post their qualification, 35.9% (n=28) receiving formal training during their qualification and 28.2% (n=22) receiving formal training post qualification. However, none of the 10 nurse practitioners reported receiving formal training post qualification. Most participants (80.8%, n=63) had received training in the form of on-the-job learning. For 43.6% (n=34) this was the only type of training they had received, and 6.4% received no training at all. No significant difference was found between the "conducting" and "contributing to" groups and the types of training they received (refer to Table 5).

Quantity

Although most of the participants had received some training, it was commonly found to be lacking in amount and adequacy. Only 38.5% (n=30) of all participants felt they had received the *right amount* of training, with the majority (60.3%, n=47) stating they had received *too little* training in order to perform their current role in DMC assessments. No significant difference was found between the "conducting" and "contributing to" groups and the amount of training received. Descriptively, however, reports of receiving *too little* training rose to 80.0% (n=8) and 66.7% (n=8) for nurse practitioners and social workers, respectively.

Adequacy

Only 14.1% (n=11) of all participants rated the adequacy of training received as *very adequate*. Participants in the "contributing to" group reported a significantly higher response for their training being *not at all* adequate (25.8%, n=8 compared to 4.3%, n=2) (p = 0.012). Those in the "conducting" group observed a significantly higher response for the adequacy of training received being *somewhat adequate* (51.1%, n=24 compared to 25.8%, n=8) (p = 0.035), as seen in Table 5.

Social workers reported the lowest level of adequacy. None selected *very adequate*; instead, 75.0% (n=9) reported that their training was either *not very* or *not at all adequate*. Open-ended responses supported that formal training is lacking, and learnings have come from individual active research and observing experienced colleagues. The valuable experience gained from observing the nuances in individuals with diminished capacity was recognised. However, it was also felt there was little in the way of defining their role in DMC assessments: "*There is very little training regarding how my role functions in relation to the capacity assessment, yet I am often tasked with explaining this assessment to patients and their families.*" Most (72.0%, n=18) medical practitioners felt their training was *very* or *somewhat* adequate. The remaining 28% (n=7) felt it was *not very* or *not at all* adequate, which was due to learning being "*mostly self-directed*" and a result of receiving no training, stating that "*We need to be formally taught how to do this rather than on the job … there is too much at stake for the patient*" and that at present the situation is "*shambolic.*"

Nurse practitioners appeared to rate adequacy better than the amount of training they had received, which was consistent with reports of receiving training in more informal ways (for example, supervision and years of experience, which involved self-learning). For those occupational therapists rating their training as *not adequate at all* (27.3%, n=3), they reported that training is overlooked and only on the job; however, 36.4% (n=4) rated their training as *very* adequate due to the provision of expert facilitators and postgraduate training for assessment tools.

Goodfellow e-learning

One source of freely available online training for DMC is the two Goodfellow Unit Capacity Assessment Training[17] modules. This online training is based on the Toolkit for Assessing Capacity[2] and is designed to train those involved in DMC

assessments. A question in the current survey captured rates of completion and awareness of the Goodfellow Training. Results showed that only 26.9% (n=21) of participants had heard of this training and only 4.0% (n=3) had completed it.

Involvement

As shown in Table 4, only 55.1% (n=43) of all participants said their current level of involvement was at the right level and 26.9% (n=21) felt they did not have enough involvement, with the remaining 17.9% (n=14) reporting they had too much involvement. Participants in the "contributing to" group had a significantly higher response for not having enough involvement ($p<0.001$), while those in the "conducting" group had a significantly higher response for having too much involvement ($p=0.006$), as seen in Table 5.

Clinical psychologists/neuropsychologists had the highest response for having the right level of involvement (91.7%, n=11). Open-ended responses highlighted reasons such as the receipt of appropriate referrals and shared responsibility across a team. Medical practitioners had the highest response for having too much involvement (40.0%, n=10). The responsibility often sits with them due to a lack of training, confidence and skills of other healthcare professionals (including junior doctors). Occupational therapists and social workers deemed they did not have enough involvement, 72.7% (n=8) and 25.0% (n=3), respectively. Occupational therapists commonly reported a lack of recognition for their potential value with their opinions, specialised knowledge and abilities often being overlooked:

> *"I feel occupational therapists have specialist understanding in cognition, as well as advocacy, and thus feel we could be more involved in this role. I have often been in multidisciplinary meetings where doctors have been talking about decisions re: capacity that I feel are unjustified and require further assessment, which I will start a conversation about. Often doctors will make a 'capacity in general' decision, whereas I feel capacity should be decision specific."*

Both occupational therapists and social workers reported that wider team consultations are often not happening, with reports that senior doctors complete assessments without talking to anyone, not even a patient's family, and often don't consider the functional assessments or the psycho-social aspects of a patient's life. The need for DMC assessments is sometimes questioned and doctors can be reluctant to complete these assessments:

> *"I've had medical practitioners refuse to do a capacity assessment on someone who is really struggling. They will not activate a power of attorney because the person has agreed to go into residential care. When I talk with the patient and discuss residential care, it is clear that they have no idea what they have agreed to."*

They can find themselves persisting with their concerns for a medical practitioner to complete a DMC assessment.

Confidence

As shown in Table 4, most participants (88.5%, n=69) felt either *quite* confident or *very* confident performing their role in DMC assessments. No significant difference was found in confidence levels between the "conducting" and "contributing to" groups (see Table 5). Nurse practitioners were the least confident, with only 10.0% (n=1) stating they were *very* confident performing their current role in DMC assessments.

Only 25.6% (n=20) of all participants felt *very* confident in being able to describe DMC to a patient, while 16.7% (n=13) stated they were *not very* or *not at all* confident. Of those reporting to be *very* confident, when asked *how* they would explain it, only 15.0% (n=3) spontaneously noted the four legal elements of capacity. A further 10.0% (n=2) named at least two of the elements. The remaining 85.0% (n=15) included reference to an individual's ability to *understand,* with very few naming the ability to communicate their decision, and in some cases appearing to misunderstand the concept of DMC, stating that it is an ability to make a "reasonable decision." Descriptively, social workers showed the highest percentage of those who were *very* confident (41.7%, n=5), while only 32.0% (n=8) of medical practitioners were *very* confident.

Discussion

As the world's population ages and assisted dying is becoming legalised in Australasia,[6,7] the need for DMC assessments is growing. This cross-sectional survey highlighted several current issues within the assessment of DMC in New

Table 4: Training, involvement and confidence in decision-making capacity assessment by total sample and individual healthcare profession.

	Total sample n=78 n (%)	**Medical practitioner** n=25 n (%)	**Clinical psychologist/ neuropsychologist** n=12 n (%)	**Nurse practitioner** n=10 n (%)	**Social worker** n=12 n (%)	**Occupational therapist** n=11 n (%)	**Other*** n=8 n (%)
Training**							
Formal training during qualification	28 (35.9)	12 (48.0)	5 (41.7)	2 (20.0)	3 (25.0)	5 (45.5)	1 (12.5)
Formal training post qualification	22 (28.2)	9 (36.0)	4 (33.3)	0 (0.0)	4 (33.3)	5 (45.5)	0 (0.0)
Informal/on-the-job training	63 (80.8)	17 (68.0)	12 (100.0)	9 (90.0)	11 (91.7)	9 (81.8)	5 (62.5)
No training	5 (6.4)	1 (4.0)	0 (0.0)	0 (0.0)	1 (8.3)	0 (0.0)	3 (37.5)
Training amount							
Too much training	1 (1.3)	1 (40.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
The right amount of training	30 (38.5)	12 (48.0)	6 (50.0)	2 (20.0)	4 (33.3)	5 (45.5)	1 (12.5)
Too little training	47 (60.3)	12 (48.0)	6 (50.0)	8 (80.0)	8 (66.7)	6 (54.5)	7 (87.5)
Training adequacy							
Very adequate	11 (14.1)	3 (12.0)	2 (16.7)	2 (20.0)	0 (0.0)	4 (36.4)	0 (0.0)
Somewhat adequate	32 (41.0)	15 (60.0)	5 (41.7)	4 (40.0)	3 (25.0)	2 (18.2)	3 (37.5)
Not very adequate	25 (32.1)	5 (20.0)	5 (41.7)	4 (40.0)	8 (66.7)	2 (18.2)	1 (12.5)
Not adequate at all	10 (12.8)	2 (8.0)	0 (0.0)	0 (0.0)	1 (8.3)	3 (27.3)	4 (50.0)

Table 4 (continued): Training, involvement and confidence in decision-making capacity assessment by total sample and individual healthcare profession.

Involvement							
Too much involvement	14 (17.9)	10 (40.0)	0 (0.0)	3 (30.0)	0 (0.0)	1 (9.1)	0 (0.0)
Right amount of involvement	43 (55.1)	13 (52.0)	11 (91.7)	6 (60.0)	9 (75.0)	2 (18.2)	2 (25.0)
Not enough involvement	21 (26.9)	2 (8.0)	1 (8.3)	1 (10.0)	3 (25.0)	8 (72.7)	6 (75.0)
Confidence to perform role							
Very confident	21 (26.9)	9 (36.0)	3 (25.0)	1 (10.0)	5 (41.7)	3 (27.3)	0 (0.0)
Quite confident	48 (61.5)	14 (56.0)	8 (67.7)	7 (70.0)	7 (58.3)	7 (63.6)	5 (62.5)
Not very confident	9 (11.5)	2 (8.0)	1 (8.3)	2 (20.0)	0 (0.0)	1 (9.1)	3 (37.5)
Not at all confident	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Confidence to explain DMC							
Very confident	20 (25.6)	8 (32.0)	3 (25.0)	1 (10.0)	5 (41.7)	3 (27.3)	0 (0.0)
Quite confident	45 (57.7)	14 (56.0)	9 (75.0)	8 (80.0)	6 (50.0)	5 (45.5)	3 (37.5)
Not very confident	10 (12.8)	2 (8.0)	0 (0.0)	1 (10.0)	1 (8.3)	2 (18.2)	4 (50.0)
Not at all confident	3 (3.8)	1 (4.0)	0 (0.0)	0 (0.0)	0 (0.0)	1 (9.1)	1 (12.5)

*"Other" group consisted of the following professionals: speech-language therapist (n=4), advocate/advocacy manager (n=2), nurse (n=1), pharmacist (n=1).
**Multi-response question percentages do not add up to 100% ("No training" exclusive answer).

Table 5: Statistical comparison of the "conducting" decision-making capacity group to the "contributing to" group.

	Conducting n=47 n (%)	**Contributing to** n=31 n (%)	**Overall Fisher's exact test***	**P-value for comparing two groups**
Training**			p=0.290	
Formal training during qualification	19 (26.8)	9 (19.1)		ND
Formal training post qualification	13 (18.3)	9 (19.1)		ND
Informal/on-the-job training	38 (53.5)	25 (53.2)		ND
No training	1 (1.4)	4 (8.5)		ND
Training amount			p=0.463	
Too much training	1 (2.1)	0 (0.0)		ND
The right amount of training	20 (42.6)	10 (32.3)		ND
Too little training	26 (55.3)	21 (67.7)		ND
Training adequacy			p=0.020	
Very adequate	7 (14.9)	4 (12.9)		p=1.000
Somewhat adequate	24 (51.1)	8 (25.8)		p=0.035
Not very adequate	14 (29.8)	11 (35.5)		p=0.627
Not adequate at all	2 (4.3)	8 (25.8)		p=0.012
Involvement			p<0.001	
Too much involvement	13 (27.0)	1 (3.2)		p=0.006
Right amount of involvement	30 (63.8)	13 (41.9)		p=0.067
Not enough involvement	4 (8.5)	17 (54.8)		p<0.001
Confidence to perform role			p=1.000	
Very confident	13 (27.7)	8 (25.8)		ND
Quite confident	29 (61.7)	19 (61.3)		ND
Not very confident	5 (10.6)	4 (12.9)		ND
Not at all confident	0 (0.0)	0 (0.0)		ND
Confidence to explain DMC			p=0.089	
Very confident	12 (25.5)	8 (25.8)		ND
Quite confident	31 (66.0)	14 (45.2)		ND
Not very confident	3 (6.4)	7 (22.6)		ND
Not at all confident	1 (2.1)	2 (6.5)		ND

*For the overall ¾-by-2 table.
**Multi-response question percentages do not add up to 100% ("No training" exclusive answer).
ND = not done because overall test not significant.

Zealand and adds to the literature previously exploring this area of clinical practice. Firstly, training was found to be lacking, particularly the provision of formal training and reports from those contributing to DMC assessment, which suggest a desire for greater involvement in these assessments. Additionally, participants, while mostly confident in their role within DMC assessments, did not feel confident in being able to explain DMC to a patient.

Two thirds of the participants involved in this survey had more than 10 years of experience. It appears that they gained the knowledge through experience and their learning being mostly on-the-job,[11] with formal qualifications being largely devoid of training in this area. A small number of our participants underwent formal training as part of their qualification, possibly because some of them completed their training many years ago when formal training in DMC assessments was likely less prevalent than it is today. What was somewhat surprising was that the amount of training received did not vary between those conducting DMC assessments and those not conducting, suggesting that training may be accessible to a wider range of healthcare professionals. However, this finding likely reflects the responses of the nurse practitioners who were part of the "conducting" group but commonly reported that the quantity of training received was too little. Adequacy of training was significantly lower among those who were part of the "contributing to" group, a potential reflection of the small proportion who had received formal training. There is a consistent message across all healthcare professions, and identified in prior research,[10,11,24] that more formal training is needed for those working in this space. It appears that the workforce would greatly benefit from an increased awareness of the training that is freely available (e.g., Goodfellow Unit Capacity Assessment Training).

Responses from medical practitioners support findings from previous studies. Namely, time constraints[25] and concerns about the responsibility sitting with them.[11] Additionally, in this study there were reports of too much involvement from those conducting DMC assessments, while those contributing to DMC assessments reported not enough involvement. Given that disagreements in DMC are common when the assessment involves more than one healthcare professional,[26] it is of concern that wider team consultation is not always happening and the knowledge and input from occupational therapists and social workers was reported to being overlooked. While wider team consultation may not always be practical in certain settings due to specialist availability, this finding supports a shift in professional dynamics, with room for greater multidisciplinary team involvement in DMC assessment processes.[24] Discipline-specific DMC support roles in the form of a "go-to" DMC expert may be beneficial to increase involvement of multidisciplinary healthcare professionals, having previously been shown to increase learning, development and engagement among occupational therapists in DMC assessments.[13]

Although most participants were confident in their role in DMC assessments, this may be due to the overall high experience level of participants who completed this survey. Importantly, nurse practitioners did not display the same confidence levels, potentially reflective of their change in role from nurse to nurse practitioner and subsequent change of scope.[27] This would suggest that nurse practitioners in particular require greater support and training when the responsibility of assessing DMC becomes a greater part of their clinical practice. Participants reported a lack of confidence in their ability to explain DMC. Very few spontaneously identified the four legal elements required of someone to have DMC, suggesting that this is not top of mind for clinicians, and the competencies expected of patients are potentially not explicitly discussed or explained to them. This is consistent with prior research showing distinct gaps in knowledge of what DMC is and what is involved when assessing it, which has been found to coincide with low confidence levels.[9,10]

Interestingly, there were no significant differences between the "conducting" and "contributing to" groups for confidence in performing their role and confidence to explain DMC to a patient. This may be a reflection of the involvement multidisciplinary healthcare professionals are already having in DMC assessments, commonly referring patients for DMC assessments[12] and liaising with families, potentially providing them with confidence in this area of their clinical practice. Given the well-researched links between confidence and performance,[28,29] it would be advised to focus attentions on improving clinicians' confidence.

Strengths and limitations

This is the only study in New Zealand to include non-medical practitioners and their viewpoints on DMC assessment. The use of both quantitative questioning and qualitative analysis of open-ended

comments allowed for an in-depth perspective, providing both a snapshot of the current issues and detailed reasons for the issues, offering clear guidance on a way forward in this complex area. The main limitation of this study is the small sample size. This is particularly relevant for results analysed by profession, which should only be taken as indicative. This study also has a sampling bias, as only professionals already engaged in this topic, or having a particular salience with DMC assessments, were eligible to complete the survey. Neither the Royal Australasian College of Physicians nor the New Zealand division of the Australian & New Zealand Society of Geriatric Medicine were invited to participate in this study; however, despite this, five geriatricians completed the survey, which was the largest medical practitioner group (along with GPs). Additionally, demographics were not collected for those that did not complete the survey, so it is not possible to analyse any differences between those who completed and those who did not complete the survey. Differentiation between informal and formal DMC assessments was not provided to participants, limiting the ability to draw conclusions by assessment type. Additionally, participants were not given detailed explanations of formal versus informal training, but we trusted the participants' judgement on this measure. The study was only conducted with healthcare professionals located in New Zealand, which means the results are only relevant to this country. These limitations mean the generalisability of the results is limited.

Future research

Closed- and open-ended comments highlighted a lack of formal training available. It would be beneficial to understand more about the training needs of multidisciplinary healthcare professionals involved in DMC assessments. Additionally, it would be recommended to conduct similar research among nurses, a significant healthcare workforce that was not well represented in this study but often has involvement in DMC assessments, particularly mental health nurses in regards to the *Mental Health (Compulsory Assessment and Treatment) Act 1992*.[30] Research is also needed to understand this complex topic among Māori and other non-European groups, and the potential adaptations and considerations required to conduct a safe and culturally comprehensive assessment.

Conclusion

Our findings suggest there is an urgent need for considerable attention and efforts to help professionals working in this area of clinical practice feel better equipped to perform their role. Given what can be at stake for an individual undergoing a DMC assessment it is imperative that improvements are made to upskill the workforce, particularly those newly entering the field. The Law Commission recently opened for submissions on DMC assessment, and so any changes in approaches to these assessments should be aligned with the legal changes and vice versa.

COMPETING INTERESTS
Nil.

AUTHOR INFORMATION
Nicola Hickling: Doctorate of Clinical Psychology Student, School of Psychology, The University of Auckland, New Zealand.
Associate Professor Clare M McCann: School of Psychology, The University of Auckland, New Zealand.
Professor Lynette Tippett: School of Psychology, The University of Auckland, New Zealand.
Associate Professor Gary Cheung: Department of Psychological Medicine, School of Medicine, The University of Auckland, New Zealand.

CORRESPONDING AUTHOR
Associate Professor Clare M McCann: School of Psychology, The University of Auckland, Private Bag 92019, Auckland Mail Centre 1142, New Zealand.
E: c.mccann@auckland.ac.nz

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Perspectives of potentially eligible Indigenous Māori on a lung cancer screening programme: a qualitative study

Sarah R Colhoun, Kate Parker, Sharon McCook, Karen Bartholomew, Billie Baty, Anna Maxwell, Kataraina Pipi, Maria Marama, Sue Crengle

ABSTRACT

AIMS: Lung cancer causes more deaths than any other cancer, globally and in Aotearoa New Zealand, where it disproportionately affects Māori. We aimed to understand Māori perspectives on lung cancer screening in Aotearoa New Zealand to guide its equity-focussed implementation, including identifying enablers and barriers.

METHODS: We took a Kaupapa Māori based co-design approach to inform future screening, recruiting Māori current/ex-smokers and members of their whānau (family) for three focus group phases held in Auckland, Aotearoa New Zealand in August 2019. Participants responded to a proposed lung cancer screening pathway and shared their attitudes and beliefs about lung cancer and screening. Results were thematically analysed.

RESULTS: The 21 Māori participants supported future lung cancer screening in Aotearoa New Zealand. Perceived benefits included being more informed about lung cancer and screening and enabling healthier future generations. Barriers to screening were previous negative health service experiences; fear; stigma; and access, including time, cost and transport. Enablers included providers' cultural competence; clear communication; a one-stop shop; and support with transport. A range of factors could potentially influence a decision to participate in screening.

CONCLUSIONS: Participants favoured future lung cancer screening and identified key barriers and facilitators of screening.

Lung cancer is the greatest single contributor to the gap in life expectancy between Māori and non-Māori[1] (non-Māori include European, Pacific, Asian and other ethnicities). Māori age–sex standardised mortality rates for lung cancer are over three times that of non-Māori.[1] While higher rates of smoking contribute to inequities, Māori deaths from lung cancer are also associated with having a greater number of comorbidities than non-Māori, being diagnosed later and having worse experiences (including racism) in the health system.[1] Māori develop lung cancer around 6 years earlier than non-Māori, and develop lung cancer with lower smoking exposures.[1]

Because lung cancer is often asymptomatic in its earlier stages, most people with lung cancer are diagnosed late and survival is low. Screening for lung cancer is important to ensure people with lung cancer are diagnosed earlier, increasing their chance of a cure. Those who are diagnosed at the earliest stage (stage 1A) have a much improved (at least 70%) 5-year survival. Screening for lung cancer has been proven internationally to be effective at reducing cancer-specific mortality in a number of high-quality trials.[2,3] While low-dose computerised tomography (LDCT) screening is increasingly accepted as an evidence-based intervention to decrease lung cancer mortality, other factors contributing to optimal implementation of screening require understanding of local contexts.[4]

Aotearoa New Zealand does not currently have a lung cancer screening (LCS) programme. Introducing a screening programme into the Aotearoa New Zealand context requires an equity focus to ensure that existing inequalities are not exacerbated. Researchers have found that LCS in Aotearoa New Zealand is feasible and likely to be cost-effective,[5,6] but ethnic-specific information is needed, including Māori perspectives on LCS, to inform future implementation.

Te Oranga Pūkahukahu: The Lung Cancer Screening Research Programme is a Māori-led approach to ensuring that a future national programme benefits Māori. The research

programme centres Te Ao Māori (the Māori world) and whānau (family) experience, drawing from Kaupapa Māori approaches (research that is done *with*, *for and by* Māori).[7] Seeking the voices and experiences of whānau Māori as the first step in programme development, then co-designing the programme itself with whānau, ensures the whole programme is built to achieve Māori health equity.

The proposed LCS process as outlined to participants involves the selection of potentially high-risk individuals, an assessment to determine individual risk, the offer of an LDCT scan to those considered high risk with shared decision making about agreeing to this offer, and then the follow-up of abnormal CT scans as required.

Methods

Kaupapa Māori research locates Māori at the centre of enquiry, aims to be of benefit to Māori, is focussed on equitable health outcomes, considers Māori world views and Māori ways of knowing, being and doing, and centres Māori aspirations. Our research focusses on a significant health issue for Māori: its goal is designing LCS that has excellent Māori participation, reduces lung cancer mortality and inequities, and is culturally safe and acceptable for Māori; and it addresses questions that are important to meet this goal. Our research was *led* by Māori, was done *with* Māori and is *for* Māori health equity gains.

Focus groups took the form of hui including marae protocols. This approach served to ensure that whānau attending felt welcomed, their spiritual needs were taken care of, they experienced manaakitanga, and hui were facilitated to ensure maximum participation by each person in the process. Notes of each hui were sent out to participants after each one and recapped at the beginning of subsequent hui. Facilitation of hui was supported by two Māori facilitators with health research and evaluation experience, particularly in the cancer care areas.

Eligibility

Invited focus group participants were Māori living in the Auckland and Waitematā regions, potentially eligible for LCS (current smokers, or ex-smokers who had quit within the previous 15 years and were aged between 50 to 75 years) and their whānau members.

Recruitment

Three focus group phases were held in Auckland between 15 and 29 August 2019. The phase one focus group was held in South Auckland (a home-based whānau group) with participants recruited through snowballing methods (researcher contacts in the first group). This group was predominantly made up of three whānau who could be categorised as "hard to reach", in that their engagement with the health system was minimal (whānau who the system has failed to engage).[8] The age range of this group was 25–55 years of age. In phase two, two groups were held at the Waitakere Hospital marae with participants recruited via an existing research database of Māori participants aged over 60 years who had participated in an abdominal aortic aneurysm (AAA) screening project and had consented to be contacted for further research. This cohort had shared risk factors (for example, smoking history) in terms of LCS eligibility. The third, and final, phase involved all participants being invited to the marae to review findings from the prior focus groups and provide feedback on the interpretation of findings. All participants in each phase were encouraged to invite whānau members to attend and participate in the focus groups.

Consent and data collection

After an initial phone call, those who were interested were sent a letter with a participant information sheet and consent form and were invited to attend a focus group session. In each phase, the hui process[9] was used to structure the session. This process incorporated mihimihi and karakia (traditional Māori welcome, greetings and prayer) and whakawhanaungatanga (relationship building) followed by kai (food) and then discussion relating to LCS (the kaupapa). The focus group then formally concluded with closing karakia. All three focus group phases were concluded by a final karakia.

Data analysis

Field notes and recordings were undertaken at the focus groups, with data coded and organised into preliminary themes by the hui facilitators (KP and MM) and co-author SMc. Transcripts were then coded by co-authors SRC and BB. SRC grouped codes into categories and developed themes, which were informed by the earlier preliminary analysis.[10]

Results

Twenty-one potentially eligible Māori (10 males and 11 females) and nine whānau members took

part in the focus groups.

In the third focus group phase, participants confirmed the following key themes: 1) positivity towards LCS, 2) fear of the disease and prior negative experience of the health system, 3) other barriers to screening, including access, 4) enablers for Māori participating in LCS, and 5) influences on LCS decision making. Feedback is presented in Table 1 and summarised below.

The second phase included participants who worked within the health system and group facilitators identified that these participants strongly favoured whānau *knowing* what was available within the health system, including screening.

Positivity towards LCS

After being taken through the proposed process for LCS, in general, Māori participants were positive towards LCS and engaged with the Kaupapa. They were hopeful that it would pave the way for healthier future generations and were altruistically focussed on the future of their whānau. They were positive about the opportunity to be more informed about lung cancer and screening, including understanding the risks and benefits of screening. They were also positive about potentially getting a second chance at life through the earlier diagnosis of lung cancer.

Fear of the disease and prior negative experience of the health system

Some participants were hesitant about LCS, mainly due to fear of the disease and prior negative experiences of the health system and screening. Some of their whānau had not survived lung cancer. Some were generally distrustful of the health system, including their own doctors. They also warned about the potential of the "grapevine" to spread negative experiences.

Other barriers, including access

Access was a significant barrier to Māori participants potentially taking up LCS. This included cost, time to attend appointments and travel. Participants voiced that for Māori, getting time off work to attend the screening was problematic, as was arranging childcare. Furthermore, the inconvenience of having to attend multiple appointments requiring repeated hospital visits was another barrier. A further barrier was the stigma of being a smoker and its association with a lung cancer diagnosis.

Enablers for LCS

On the other hand, factors that could enable Māori to take part in LCS included:

Practical support

Support with transport could take the form of taxi or parking chits, transport to screening or mobile sites in rural communities. Time off work to attend screening and a "one-stop shop" arrangement where participants could address multiple health needs at one time were also favoured.

Kaupapa Māori approaches

Culturally safe practices, specifically a focus on Kaupapa Māori, were very important. Participants valued whānau-friendly processes, such as whānau support at screening and being able to take children to appointments. They also appreciated a culturally competent and kind navigator to walk alongside them. They suggested communication that was grounded in te reo Māori (Māori language) and tikanga (cultural practices), although they did acknowledge limits around eligible people's resonance with and confidence in te reo Māori due to historical trauma and colonisation. Whakawhanaungatanga was a key aspect of any potential LCS programme. Participants said that they would respond better if those facilitating the programme took time to engage in relationship building, at initial contact as well as throughout delivery of screening services. Trust and friendliness of providers was important.

Clear, meaningful communication

Clear communication that was culturally responsive included accessible study information (written in everyday, non-clinical language) and clear explanations of risk was an enabler. Participants wished to be reassured that taking part in screening did not necessarily mean a death sentence and that there was potential for cure if caught early.

Programme messaging, awareness raising and role modelling

Programme messaging that promoted a "by Māori, for Māori" approach to LCS and that was cognisant of the connotations of specific word choice was an enabler. For example, it was felt that wording needed to be strong yet positive to encourage people to take the invitation to screening seriously while not putting them off. It was important to raise awareness among Māori of

Table 1: Focus group themes.

Theme	Sub-theme	Feedback	Focus group phase
Positivity towards LCS	Personal experience	"*We've all experienced cancer*."	FG1
	Being informed	"*Awareness and some knowledge is awesome I think*."	FG1
		"*There is actually something that I can do about that.*"	FG1
		"*The confirmation, the knowing that yeah everything is good, which is cool.*"	FG1
		"*Their* [FG2 participants] *experiences were that whānau need to know—they need to know now. So screening was about knowing what was happening.*"	FG3
	Whānau–hapū–iwi-focussed	"*I'm looking at my mokos* [grandchildren] … *and I'm thinking this won't happen to them. And you know…. that's what we are doing this for to make it better for the coming generations.*"	FG1
		"*Because each family, if they look after themselves, their hapū* [sub-tribe] *will be safe and then their iwi* [tribe] *should be safe. So everything starts in the home, not out there*."	FG2
		"*I support it simply because it will help us in our future and our iwi you know?*"	FG1
	New chance at life	"*I feel that this lung cancer scanning would be very positive for me and it would be like I'd be wearing a new korowai* [cloak of protection]. *Yeah I'd be happy with that*."	FG1
Fear of the disease and prior negative experience of the health system	Fear	"*Cancer it's a death sentence. It's basically 'you're gonna die'*."	FG3
		"*Our Māori women don't turn up for breast screening because they're scared shit*[less] *that they will be diagnosed with breast* [cancer]."	FG2
		"*So the fear was that if you get diagnosed with cancer for you that's going to … carry on forever and it won't ever go away*."	FG3
		"*Ok, if you can't confirm to me that it has no side effects, I have doubts about that*."	FG1
	Bad experiences	"*I've had a bad experience, um, in breast scanning so that's how I feel even after today because I refuse to go back to breast cancer* [screening]."	FG1

Table 1 (continued): Focus group themes.

	Distrust/relationships	"*That relationship, the way you were treated the last time* [can be a] *barrier … it wasn't last time, it was the last screening of any kind really, and you had a bad experience. I would hesitate to go personally*."	FG2
	Grapevine spreads negative messages	"*If something went wrong I would be really riri* [angry] *and I would tell everybody about my bad experience*."	FG1
		"*And some of the kōrero* [conversations], *that grapevine … when they don't like something. And, um, and they will say, no, don't go there. Don't go there*."	FG2
Other barriers, including access	Access—cost	"*Wouldn't do it* [LCS] *if it cost money*."	FG1
	Access—transport	"*Too far from home, can't get there. Access*."	FG2
	Access—time/ whānau/work commitments	"*Whānau support if you've got young kiddies can you take them to your appointment? Somebody needs to look after them—that stops people from screening*."	FG3
		"*He has huge concerns about work. He's there every day. He doesn't want to take a day off to go to the doctor*."	FG1
	Stigma	"*There's this whole smoking thing around lung cancer … people like thinking or saying you got lung cancer 'cause you smoked for this long or just somehow blaming the person for having a disease that literally kills anybody it feels like it*."	FG1
	Inconvenience	"*That's a big one when you go to the hospital and you go to an outpatients area to do all your out-patients stuff and yet you've got to go to five different places to talk to people about your screening stuff. Yeah at different times*."	FG3
		"*That you're not coming back to the hospital all the time. It's just inconvenient you know*."	FG3
Enablers for LCS	Practical support	"'*Cause diabetes has satellites … so why can't the other services have satellite of some sorts, you know, you've got, um, cervical, you've got breast screening that has the mobile clinics. You have, um, dialysis who transports the patients by taxi and then transport them home. So there's … no cost to the patient whatsoever.*"	FG2
	One-stop shop	"*If someone was going to the hospital, how can they address three different things at one time?*"	FG2

Table 1 (continued): Focus group themes.

	Kaupapa Māori approaches	"*But when it's given … Kaupapa Māori, delivered in a Kaupapa Māori way, in a Kaupapa Māori setting, then we can actually … I sit there and I look at what's on the wall and anything Kaupapa Māori I say okay. That makes sense to me.*"	FG2
		"*I like anything that starts with whakawhanaunga … so you could ask me to do anything after I know everyone in the room. I know who the people who want my information [are] or who want my opinion. If I knew you and you knew me and you told me who everyone was then I feel fine*."	FG1
	Clear, meaningful communication	"*Yeah like 'nodule' I have no idea what a nodule is*."	FG1
		"*The simple language and having motivation to actually do it … And if I get really good clear information, I'm happy*."	FG3
	Whānau-focussed	"*What's needed to make a decision so for this group it was if my whānau can be with me throughout the process*."	FG3
		"*I'm only going to start with my own whānau at first and then maybe leading by example, the other whānau would actually hop on the band-wagon. But first and foremost, I would take care of my whānau and my health*."	FG2
Promotion	Programme messaging, awareness raising, role modelling	"*If my mum did it and my Auntie did it then I [would] just do it just 'cos they're doing it*."	FG1
Influences on decision making	Information	"*Decision making, what they need is facts. Yeah. What they need is the detail, detailed information. What happened? Why does that happen?*"	FG2
	Established relationship with doctor	"*I would personally do it* [make decision about LCS] *with my GP* [general practitioner] *because I have a relationship with them … but … if I didn't have a GP like I wouldn't talk to a doctor if it wasn't my doctor I wouldn't talk to him.*"	FG1
	Key decision maker within the whānau	"*You try and you focus on the members of the whānau who do make a decision 'cos I feel like I could tell him 'go get a screening' and he'd go because I told him to*."	FG1
		"*You're not having to do the work to convince this whole whānau to go. You're just convincing one person to go*."	FG1

Table 1 (continued): Focus group themes.

	Autonomy	"*It's up to you. I like that because it didn't sound pressuring, it didn't sound like you should do this, it was just you need to weigh* [up] *the pros and cons and decide for yourself.*"	FG1
		"*I'd like to make my own decisions … and I like to have all the information*."	FG1
	Invitation source	"*Because if I got a DHB* [District Health Board] *letter, I probably wouldn't open the DHB letter.*"	FG1

why screening was necessary. The wider community could role model screening behaviour, influencing the uptake of LCS.

Influences on decision making

Decisions to take part in LCS could be influenced by quality (detailed and factual) information; GP (general practitioner) relationships; a key decision maker within the whānau; autonomy over the decision-making process; and the invitation source. Participants valued being able to make a decision that was right for them and one they were not feeling pressured into by the way the information was framed. Some participants felt they would respond better to an invitation to participate in LCS from their GP rather than a "cold call" letter or phone call. Participants felt the key decision maker within the whānau would need to be involved in decisions for other whānau members to take part in LCS. It was therefore important to appeal to whānau units and whānau decision makers.

Discussion

This study aimed to gain an understanding of Māori perspectives of LCS through a series of focus groups to guide equity-focussed implementation. Our study has identified some of the key barriers and facilitators for Māori participation in LCS. Overall, Māori participants enthusiastically supported future LCS in Aotearoa New Zealand, with perceived benefits including being more informed about lung cancer and screening, and improving the health of future generations. Perceived barriers to screening included fear of the disease and/or a cancer diagnosis; prior negative experience of the health system and screening; stigma from the association with smoking; access barriers, such as time to attend appointments, cost and transport; as well as inconvenience. Perceived enablers of a culturally acceptable LCS programme were practical support such as transport; a "one-stop shop" health service visit that combined health appointments; culturally competent practices; clear communication; user-friendly processes; and promotion within and among Māori whānau. Participants identified a range of factors influencing a decision to participate in LCS. Anticipated barriers to LCS for Māori are suggestive of racism and echo the results of a recent qualitative review, summarising healthcare experiences of Māori within "*an alienating public health system.*"[8]

The equity focus of our research programme is a novel approach to LCS internationally and to other cancer screening programmes within Aotearoa New Zealand. Other national cancer screening programmes in Aotearoa New Zealand (breast, bowel and cervical) have not been *designed* from an equity perspective. This study's key strength is that it describes the views of Māori who would potentially be eligible for LCS and of their whānau regarding LCS and the design of a potential LCS programme. Many of those who participated in the early focus group research have gone on to become the programme's consumer advisory group, Te Hā Kotahi (broadly translated as "united breath"). This group meets regularly, supported by Health New Zealand – Te Whatu Ora kaumātua (respected elders), and has contributed significantly to the framing of the research programme, research questions, participant materials, logo and design, and to the name of the programme. The programme is led by a Māori principal investigator (Professor Sue Crengle) and all data are governed by Māori members of a steering group. Our results are limited by the limited demographic information we have about participants. While efforts have been taken with transcription

and qualitative analysis to ensure data integrity, not all parts of the recordings were able to be transcribed clearly and where this occurred, the discussion was not included in the data analysis and results. Like all qualitative research, these results are not necessarily generalisable outside the context where they were gathered; for example, they may not reflect the views of some Māori who live more rurally.

Our work builds on other Aotearoa New Zealand co-designed participatory research with Māori that identifies enablers and barriers to diagnosis of lung cancer.[11] Previous research has focussed on earlier diagnosis of symptomatic lung cancer within primary care. Our research is specific to the setting of a potential national LCS programme. Commonalities between these two strands of qualitative research with Māori participants include: the importance of the GP–patient relationship (potentially either helping or hindering the diagnostic pathway); access, including the cost and availability of health-care/services, travel and childcare; interest from Māori patients in being more informed about lung cancer; fear, and the association of a lung cancer diagnosis with a death sentence; the provision of information about lung cancer in clear and straightforward language; awareness of potential language barriers for people who only speak te reo Māori; and the importance of whakawhanaungatanga and manaakitanga, which includes taking good care of whānau throughout the cancer screening journey.[11]

Importantly, our research fits within the international research gap specifically concerning LCS and equity, particularly for Indigenous peoples. Over the last few decades, the international evidence base for LCS has expanded, supporting the use of organised LCS programmes across varied health systems.[4] Currently, national programmes are in place in the United States, Poland, Croatia and South Korea, with smaller-scale programmes underway elsewhere, such as those in Canada, Australia and Europe. In 2022, the United Kingdom recommended targeted LCS.[4] A recent *Lancet* review summarises the LCS evidence base and identifies opportunities for optimising LCS, including tailoring screening geographically for specific populations and incorporating smoking cessation and assessment for chronic obstructive pulmonary disease (COPD) and cardio-vascular disease (CVD).[4] The review states that "*LCS programmes must focus on health equity*", and highlights that culturally safe approaches are "critical".[4] Other pro-equity suggestions for improving access to LCS include mobile CT scanners and offering free ride-shares to screening.[4]

Our results align closely with international evidence concerning barriers to participation in LCS: "*poor awareness of LCS, concerns about the risk of false positives, distrust of the health-care system, smoking-related stigma, inconvenience, fear of a cancer diagnosis, and worries about financial cost.*"[4] Our findings add to Australian research that identifies that Indigenous barriers to lung cancer diagnosis and treatment include a lack of public transport and inadequate communication, as well as poor coordination between health services.[12] Similarly, in Scotland (the LUNGSCOT study, focussed on eligible Scottish residents rather than on ethnic inequities), barriers to engaging in LCS included fear, stigma, mistrust towards health systems and professionals and practical constraints including travel, cost, time, and competing priorities; enablers included positive messaging and the use of mobile units to improve accessibility.[13] Cavers et al.[13] found that LCS was broadly acceptable to participants, some of whom lived in rural and deprived areas.

Our LCS research programme also aligns with key Aotearoa New Zealand policy directives. Recent national reforms of the Aotearoa New Zealand health system have led to an Interim New Zealand Health Plan, *Te Pae Tata*, which prioritises equity.[14] Explicitly, *Te Pae Tata* states, "*We will be committed to achieving equitable health outcomes for Māori.*"[14] This includes enabling "*The voice of whānau in the design and delivery of services that are culturally safe and produce equitable outcomes.*"[14] Health equity for Māori is a key specified outcome of the new *Pae Tū: Hauora Māori Strategy 2023*, with its commitment to honouring Te Tiriti o Waitangi.[15] Similarly, a key goal of the *New Zealand Cancer Action Plan 2019–2029* is that "*New Zealanders experience equitable cancer outcomes.*"[16]

In Aotearoa New Zealand, engaging with Māori specifically around LCS had not been done before. Engaging with Indigenous communities from the very early stages of research or programme design is an important first step for introducing equity into the cancer screening pathway. Co-design of Te Oranga Pūkahukahu, the LCS programme, has included engagement with Māori communities, building long-term relationships, co-creating the screening pathway and its associated resources, ensuring mana motuhake (self-determination, control) and addressing key

aspects of existing stigmatisation, racism and health system inequities.

A key aspect of Te Oranga Pūkahukahu is participatory involvement of Māori who are potentially eligible for LCS, and their whānau, with their input co-designing the direction and application of the research, ultimately to co-produce a national programme that ensures Māori benefit.

Co-design is becoming more common in health research, with its focus on ensuring that research is meaningful to end-users.[17] Simply put, co-design means "*Designing* with, *rather than designing* for."[18,19] Within other cancer screening programmes in Aotearoa New Zealand, Māori women have been involved in co-design in HPV cervical cancer self-testing, as part of qualitative research specifically concerning acceptability.[20] To a certain extent, co-design has influenced recent international qualitative research (Canada, United States, Australia) with Indigenous populations that has sought to understand Indigenous perspectives and experiences of cancer screening programmes, including cervical,[21,22] breast[23–25] and colorectal.[26] These studies have expanded the evidence base about enablers and barriers to Indigenous participation in cancer screening.

Cancer Australia has recently engaged in LCS co-design workshops with Aboriginal and Torres Strait Island populations in their national programme preparation;[27] however, there is little published evidence specifically concerning LCS and Indigenous co-design. A few qualitative studies discuss LCS research in the context of vulnerable populations and equity, including the use of co-design for smaller programme aspects such as learning materials for health professionals,[28] patient-centred research questions[29] and providing feedback about the design of LCS, specifically the pathways for engaging people with a biomarker blood test.[30]

As a result of participatory involvement in our study, Māori participant feedback from the three focus group phases has directly influenced the development of Te Oranga Pūkahukahu. The focus group findings reported here, alongside surveys (to be reported elsewhere) are the foundational aspects of the programme, which is now offering LDCT to Māori participants.[31] The focus groups and subsequent survey have informed the central research question of a randomised controlled trial, currently underway, that compares two different invitation approaches to LCS—via GPs or central hub.[31]

Māori are generally supportive of LCS; however, a number of factors need to be taken into account to enable participation in the screening pathway. Our findings lend support to the implementation of LCS in Aotearoa New Zealand.

COMPETING INTERESTS
The authors declare that they have no competing interests.

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AUTHOR INFORMATION
Sarah R Colhoun: Assistant Research Fellow, Ngāi Tahu Māori Health Research Unit, University of Otago, Dunedin, Aotearoa New Zealand.
Dr Kate Parker: Programme Manager, Te Whatu Ora Waitematā, Auckland, Aotearoa New Zealand.
Sharon McCook, Waikato Tainui: GM Strategic Investment and Planning, Te Aka Whai Ora, Auckland, Aotearoa New Zealand.
Dr Karen Bartholomew: Public Health Physician, Director Health Outcomes, Te Whatu Ora Waitematā, Auckland, Aotearoa New Zealand.
Billie Baty: Research Assistant, Te Whatu Ora Waitematā, Auckland, Aotearoa New Zealand.
Anna Maxwell: Project Manager, Te Whatu Ora Waitematā, Auckland, Aotearoa New Zealand.
Kataraina Pipi, Ngāti Porou, Ngāti Hine: Independent Consultant, FEM, Auckland, Aotearoa New Zealand.
Maria Marama, Ngāti Whakaue, Te Arawa, Kuki Airani: Independent Consultant, FEM, Auckland, Aotearoa New Zealand.
Professor Sue Crengle, Kāi Tahu, Kāti Māmoe, Waitaha: Professor, Ngāi Tahu Māori Health Research Unit, Dunedin, Aotearoa New Zealand.

CORRESPONDING AUTHOR
Professor Sue Crengle, Kāi Tahu, Kāti Māmoe, Waitaha: Professor, Ngāi Tahu Māori Health Research Unit, PO Box 56, University of Otago, Dunedin 9054, Aotearoa New Zealand. Ph: 021 832 346
E: sue.crengle@otago.ac.nz

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Changes in alcohol-related emergency department presentations—a comparison of three waves in 2013, 2017 and 2022

Laura R Joyce, Lana Cleland, Elise Forman, Alex Hlavac, James Foulds, Rose Crossin

ABSTRACT

AIMS: Emergency departments (EDs) around the world are increasingly overcrowded, which is associated with significant patient harm. Alcohol use is a known contributor to ED overcrowding. This study aimed to assess trends in the characteristics of alcohol-related ED presentations over time.

METHODS: A cross-sectional observational study of Christchurch ED attendances during 3-week waves of data collection in November–December 2013, 2017 and 2022 was conducted. Potential participants were those patients attending the Christchurch Hospital ED who had ingested alcohol in the 4 hours prior to arrival, and/or the presentation was thought to be related to alcohol. Those who consented to take part were interviewed to examine amount and source of alcohol.

RESULTS: There has been a change in the age profile towards a greater proportion of older patients attending the ED with alcohol-related issues. In 2022, a greater proportion of alcohol was purchased from on-licence venues compared to previous years, although off-licence alcohol purchase and consumption in private locations remained the most common.

CONCLUSION: Alcohol use and harm places a significant, yet preventable, burden on EDs and the wider healthcare system. Implementation of evidence-based alcohol policies is urgently needed to reduce the impact of alcohol in the ED and improve the health of communities.

Emergency departments (EDs) around the world are increasingly overcrowded, with excess numbers of patients and long wait times being associated with significant patient harm.[1] Additionally, rates of preventable errors increase,[2] patients who require urgent assessment and treatment leave without being seen by a doctor[3] and ambulances are diverted.[4] Alcohol use is a known contributor to ED overcrowding,[5] with research in Australasia identifying 5–7% of ED presentations as being alcohol-related.[6] Alcohol-related ED presentations have longer lengths of stays.[7] In several previous studies, 16–21% of injury-related ED attendances have involved alcohol consumption,[8] with presentations of this nature being linked to a fivefold risk of mortality in the year following admission.[9]

Alcohol-related ED admissions, particularly for acute harms, may be a useful indicator of recent changes in drinking patterns, including those resulting from alcohol policy and the wider alcohol environment, such as the pervasiveness of alcohol advertising.[10] Within New Zealand, alcohol-related admissions to the Christchurch Hospital ED have been studied prior to and following the implementation of the *Sale and Supply of Alcohol Act 2012*, which was introduced with the aim of minimising alcohol-related harm.[11] However, these studies did not identify a significant change in the percentage of alcohol-related admissions following the introduction of the *Act*.[12,13] This was partly attributable to unsuccessful attempts to establish a Local Alcohol Policy (LAP) in Christchurch, with more minor changes made by the overarching *Act* being unlikely to significantly reduce the burden of alcohol on this ED.[12]

The COVID-19 pandemic has seen significant changes in alcohol use and purchase behaviours, both globally and in New Zealand. These changes have involved increases in overall alcohol consumption for some groups of individuals, but decreases for others.[14] Several factors, such as working from home, female gender and psychological distress, have been linked to increased drinking during the early pandemic period,[15] while the closure of on-licence venues, such as bars and restaurants, led to more alcohol being purchased from off-licence venues such as supermarkets.[16] Alcohol delivery also became increasingly popular during this period, and was related to

heavier drinking and concerns about insufficient age verification processes.[17] As several of these changes are likely to have persisted following the ending of lockdowns in New Zealand, alcohol-related ED admissions may provide insight into how alcohol use currently impacts the health system.

Aims

The present study is the planned third wave of the study conducted in 2013 and 2017 and aimed to assess any changes in the characteristics of alcohol-related ED presentations over time, particularly looking at where alcohol was purchased prior to an ED attendance.

Methods

Study design

A cross-sectional observational study of Christchurch ED attendances during three 3-week waves of data collection in November–December 2013,[12,18] 2017[13] and 2022 was conducted.

Setting

Christchurch Hospital is a tertiary referral centre in the South Island of New Zealand, and the only major hospital in the region, covering an area with a population of over 600,000. The Christchurch ED is one of the busiest EDs in Australasia, with over 130,000 presentations annually.

Participants and data collection

Two University of Otago medical students were funded by The Health Promotion Directorate at Health New Zealand – Te Whatu Ora (formerly the Health Promotion Agency) via summer studentships in each of the waves in 2013, 2017 and 2022. Data were collected over a 3-week period with 2 full weeks of 8-hour shifts being covered over each wave, with similar dates each time (16 November–8 December 2013; 17 November–9 December 2017; 16 November–12 December 2022).

The study had been planned to occur every 4 years; however, the 2021 wave was delayed by a year due to increased COVID-19 alert levels during the planned 2021 dates. The study periods were chosen to align as closely as possible in each wave, with one public holiday weekend falling within each study period. Shifts were non-randomly allocated to mitigate fatigue on the interviewers, but with equal sampling of day (8 am–3:59 pm), evening (4 pm–11:59 pm) and night (12 am–7:59 am) shifts. Several events associated with high alcohol consumption, including "Cup Day" (New Zealand Trotting Cup), and "Crate Day" (an informal event where people are encouraged to buy and consume a "crate" of beer/other alcohol) fell within the study period.

Potentially eligible participants were identified among patients who attended the Christchurch ED within each data collection wave. The study aimed to identify all eligible patients who presented during each study shift. The interviewers had access to the ED electronic whiteboard, which was used to prioritise which patients would be assessed for inclusion. Patients were considered eligible to participate if they had ingested alcohol in the 4 hours before presentation to ED (coded as "Screen positive"), or if their presentation was directly related to alcohol use or they were visibly under the influence of alcohol (both coded as "Impact positive"). To determine eligibility, interviewers first approached the triage nurse (for patients in the waiting room) or the patient's primary nurse or doctor (for patients in bed spaces) to determine if the patient was appropriate to interview. Patients were then approached and invited and consented to take part in the study. It should be noted that in the first two waves of this study, students approached patients directly to seek consent to participate; however, for 2022 the Ethics Committee deemed it necessary for the students to first discuss with the treating doctor or nurse to determine suitability to be approached for consent.

Patients under 16 years were asked to assent to take part, but with parents/guardians also being asked to consent on their behalf. Patients were not approached if they were under 13 years old, or if staff felt that they were too unwell (e.g., altered level of consciousness) or it was inappropriate (e.g., uncooperative) to approach them. Patients with possible COVID-19 in isolation rooms were not approached due to the potential risk to the health of the interviewers—therefore, the study is not able assess the burden of alcohol-related ED presentations over time. A count of all ED attenders was done by the interviewers using the electronic whiteboard to allow the calculation of the denominator of ED attendances during each study shift.

The Northern B Health and Disability Ethics Committee approved this study (21/NTB/182) and

the Canterbury District Health Board (CDHB) provided locality authorisation (RO#21236). Te Komiti Whakarite, the CDHB Māori health research committee, supported this study.

Measures

Demographic information including age, gender and ethnicity was collected from consenting participants. Ethnicity data were prioritised in the following order, in line with New Zealand Ministry of Health ethnicity data protocols:[19] New Zealand Māori; Pacific peoples; other; European.

The date and time of arrival, reason for attendance and ED length of stay data were retrieved from the electronic patient management system. Participants' observed level of intoxication was noted as either "sober", "affected" or "intoxicated" using the Intoxication Assessment Tool.[20] Participants were asked how many standard drinks (10g alcohol) they consumed in their most recent drinking session (coded against the alcohol intake guidelines for single occasion of drinking),[21] the location of purchase and consumption of alcohol, type of alcoholic beverage and the time drinking commenced. The 10-item Alcohol Use Disorders Identification Test (AUDIT)[22] was administered to assess participants' regular drinking habits.

Participants were categorised into "screen" and "impact" positive or negative. Screen-positive participants were those who had ingested alcohol in the 4 hours before ED arrival. Impact positive were those whose reason for ED presentation was thought to be directly related to alcohol, such as a fall while intoxicated, or vomiting due to alcohol use. Presentations were further coded as "Alcohol-related" if participants were either observed to be influenced by alcohol while in the ED, or their presentation was thought to be related to alcohol ("impact positive").

Statistical analysis

Statistical comparisons were performed in Stata (version 16.1 for Windows) using Chi-squared tests for categorical outcomes and Kruskal–Wallis to test for differences between medians for continuous outcomes (after testing data for lack of normality using Shapiro–Wilk).

Results

Over the three waves of this study, 412 patients consented to take part, with a total of 109 participants during the 2022 data collection period. Figure 1 demonstrates the participant inclusion flow over the three waves.

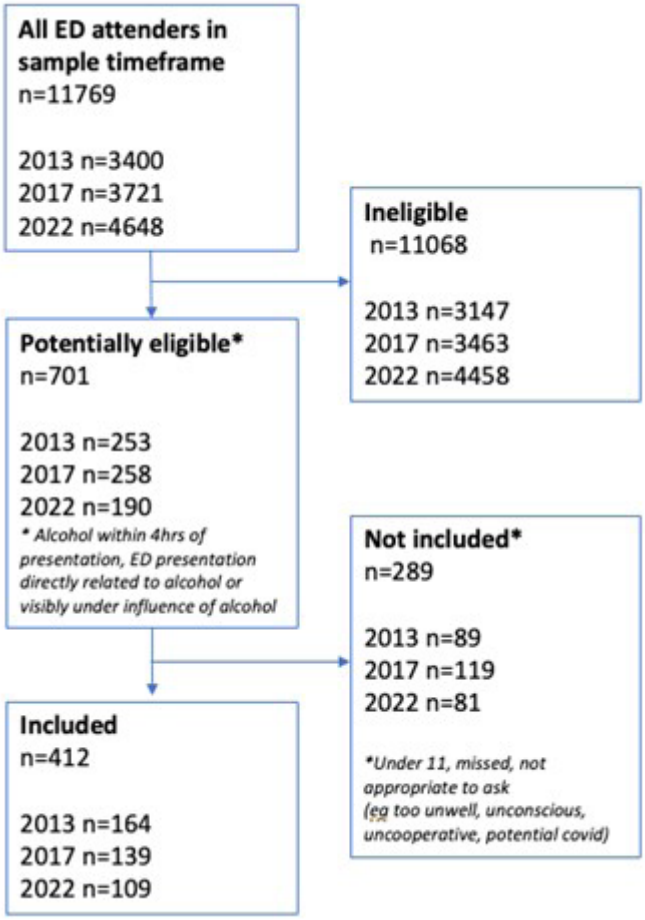
As shown in Table 1, most participants were male and ranged in age from 15 to 88 years. Significant differences in age groups were observed across the three time points, with 2022 featuring a lower proportion of those in the 18–24 category and greater proportions in the 25–44 and 65+ age categories. There were differences in ethnicity across data collection periods, with fewer Māori and Pacific participants in 2022.

Arrival day and time remained relatively stable and did not differ significantly across the three time points. Most presentations in 2022 were due to non-interpersonal trauma or medical/other reasons, while an increase in presentations due to alcohol excess was observed for this data collection period.

Table 2 demonstrates the amounts and sources of alcohol for all participants who consented to take part in the study. The median number of standard drinks and percentage of participants consuming alcohol over the recommended guidelines has decreased; however, injury-related attendances have been similar over the three waves. Although off-licence premises (e.g., liquor stores, supermarkets, online retailers) continued to be the most common source of alcohol in 2022, the proportion of those who purchased their alcohol from on-licence premises (e.g., bars, nightclubs, restaurants) more than doubled from 2017 to 2022. In 2022, the most common places of purchase were liquor stores, followed by on-licence premises and supermarkets (which sell beer, wine and cider only).

Table 3 presents a sub-group analysis of only those participants included in the study who had alcohol-related ED presentations. This includes participants who were observed to be influenced by alcohol while in the ED, or those whose presentation was thought to be directly related to alcohol ("impact positive"). There has been no significant change in the percentage of presentations that were alcohol related, with approximately two thirds being alcohol related in each wave. The number of participants who are consuming alcohol at levels above recommended guidelines is higher in this sub-group than all participants (Table 2); however, this percentage has also decreased over the three waves. The source of alcohol is no longer significantly different between on- and off-licences in this sub-group of alcohol-related presentations.

Figure 1: Flowchart of eligibility by data collection wave.



Discussion

Alcohol harm is pervasive across New Zealand and is associated with significant morbidity and mortality. Alcohol-related morbidity can be acute, such as injury and overdose, or chronic, arising from the effects of long-term use. An estimated 5.4% of all premature deaths in New Zealand are attributable to alcohol, with many resulting from alcohol-related injuries, several different forms of cancer and diseases such as liver cirrhosis and pancreatitis.[23] These conditions place significant pressure upon the healthcare system, including a high financial burden[24] and increased demands on hospital staff and resources.[25]

This study provides an updated snapshot of the burden of alcohol on the Christchurch ED across 42 shifts in November and December 2022, compared to similar periods in 2017 and 2013. During the 2022 wave, there were 109 participants who consented for the study, of which 68 presentations were perceived to be directly attributable to alcohol use. This is a preventable burden on the health system. It must be recognised that the COVID-19 healthcare environment changed the ability of researchers to approach all patients, with those patients in isolation avoided. Therefore, the raw number of participants consenting to take part should not be compared across the three waves.

Although media attention often focusses on "young people drinking in pubs and bars on a Saturday night", this is not the case in terms of ED presentations in this study. Over the three waves the median age of participants has increased to 39 years, and presentations in the 65+ age group have doubled; however, presentations have decreased in the 18–24-year age group. This decrease in young people drinking has been seen in other high income countries.[26]

Table 1: Characteristics of participants presenting during each wave of data collection.

	Data collection wave			
	2013	**2017**	**2022**	**Statistical test***
Number of participants	164	139	109	
Male gender: n (%)	106 (64.6%)	96 (69.1%)	70 (64.2%)	X^2=0.87, p=0.65
Age categories (years): n (%)				
<18	9 (5.5%)	5 (3.6%)	4 (3.7%)	
18–24	46 (28.1%)	36 (25.9%)	17 (15.6%)	
25–44	49 (29.9%)	47 (33.8%)	44 (40.4%)	**X^2=16.12, p=0.04**
45–64	41 (25.0%)	31 (22.3%)	18 (16.5%)	
65+	19 (11.6%)	20 (14.4%)	26 (23.9%)	
Age: median (IQR)	32.5 (22–51)	34 (23–52)	39 (27–61)	X^2=5.72, p=0.06
Prioritised ethnicity: n (%)				
NZ Māori	21 (12.8%)	21 (15.1%)	13 (11.9%)	
Pacific	3 (1.8%)	5 (3.6%)	2 (1.8%)	
Other	8 (4.9%)	10 (7.2%)	12 (11.0%)	X^2=5.54, p=0.48
European	132 (80.5%)	103 (74.1%)	82 (75.2%)	
ED arrival time: n (%)				
Day (8 am–3:59 pm)	33 (20.1%)	34 (24.5%)	26 (23.9%)	
Evening (4 pm–11:59 pm)	81 (49.4%)	67 (48.2%)	47 (43.1%)	X^2=1.98, p=0.74
Night (12 am–7:59 am)	50 (30.5%)	38 (27.3%)	36 (33.0%)	
Day of ED presentation: n (%)				
Monday–Thursday	55 (33.5%)	53 (38.1%)	40 (36.7%)	X^2=0.73, p=0.70
Friday–Sunday	109 (66.5%)	86 (61.9%)	69 (63.3%)	
Reason for ED presentation: n (%)				
Motor vehicle accident	2 (1.2%)	5 (3.6%)	4 (3.7%)	
Non-interpersonal trauma	60 (36.6%)	50 (36.0%)	33 (30.3%)	
Interpersonal trauma	16 (9.8%)	19 (13.7%)	9 (8.3%)	
Alcohol excess	9 (5.5%)	3 (2.2%)	12 (11.0%)	**X^2=21.48, p=0.02**
Mental health/overdose	23 (13.0%)	7 (5.0%)	8 (7.3%)	
Medical/other	54 (32.9%)	55 (39.6%)	43 (39.5%)	

Table 1 (continued): Characteristics of participants presenting during each wave of data collection.

Alcohol-influenced ED presentation: n (%)				
Screen positive*/impact negative	37 (22.6%)	29 (20.9%)	27 (24.8%)	X^2=1.08, p=0.90
Screen positive/impact positive**	64 (39.0%)	60 (43.2%)	41 (37.6%)	
Screen negative/impact positive	37 (22.6%)	29 (20.9%)	27 (24.8%)	

*Screen positive = ingested alcohol in the 4 hours before ED arrival.
**Impact positive = reason for ED presentation thought to be directly related to alcohol.

Table 2: Comparison of alcohol-related measures between waves: **all included participants**.

	Data collection wave			
	2013	**2017**	**2022**	**Statistical test***
Number of participants	164	139	109	
Standard drinks consumed in index drinking episode: n (%)				
<5	53 (32.3%)	41 (29.5%)	50 (45.9%)	**X^2=23.82, p=0.01**
5–9	33 (20.1%)	39 (28.1%)	22 (20.2%)	
10–14	22 (13.4%)	19 (13.7%)	14 (12.8%)	
15–19	23 (14.0%)	10 (7.2%)	4 (3.7%)	
20+	33 (20.1%)	25 (18.0%)	18 (16.5%)	
Unknown	0 (0.0%)	5 (3.6%)	1 (0.9%)	
Standard drinks				
Median (IQR)	8 (3–17)	8 (3–15)	6 (2–12)	X^2=5.3, p=0.07
Consumption over guidelines				
No	53 (32.3%)	43 (30.9%)	52 (47.7%)	**X^2=15.80, p<0.00**
Yes	111 (67.7%)	91 (65.5%)	56 (51.4%)	
Unknown	0 (0.0%)	5 (3.6%)	1 (0.9%)	
Injury-related attendance: n (%)				
	78 (47.6%)	74 (53.2%)	46 (42.2%)	X^2=3.01, p=0.22
Source of alcoholic beverage(s): n (%)				
On-licence	25 (15.2%)	14 (10.1%)	27 (24.8%)	**X^2=17.69, p=0.01**
Off-licence	117 (71.3%)	110 (79.1%)	70 (64.2%)	
Both	22 (13.4%)	12 (8.6%)	12 (11.0%)	
Other or unknown	0 (0.0%)	3 (2.2%)	0 (0.0%)	

Table 2 (continued): Comparison of alcohol-related measures between waves: **all included participants**.

Off-licence purchase location: n (% of all non-on-licence source: 2017, n=125; 2022, n=82)				
Liquor store	Not available	73 (52.5%)	45 (41.3%)	**X^2=13.1, p=0.01**
Supermarket		29 (20.9%)	26 (23.9%)	
Other/unknown/multiple		23 (16.6%)	11 (10.1%)	
Place last drink consumed: n (%)				
Private location	108 (65.9%)	99 (71.2%)	70 (64.2%)	X^2=10.10, p=0.26
On-licence venue	43 (26.2%)	25 (18.0%)	33 (30.3%)	
Unlicenced public location	5 (3.1%)	5 (3.6%)	4 (3.6%)	
Other or unknown	8 (4.9%)	10 (7.2%)	2 (1.8%)	
Type of alcoholic beverage(s) being consumed: n (%)				
Beer	52 (31.7%)	46 (33.1%)	34 (31.2%)	X^2=2.65, p=0.96
Wine	27 (16.5%)	23 (16.6%)	20 (18.4%)	
Spirits	23 (14.0%)	17 (12.2%)	16 (14.7%)	
RTDs*	20 (12.2%)	21 (15.1%)	10 (9.2%)	
Other/various	42 (25.6%)	32 (23.0%)	29 (26.6%)	
AUDIT score				
Median (IQR)	Not administered	11 (6–18)	11 (7–17)	X^2=0.03, p=0.86
% scoring <8		39 (28.1%)	30 (27.5%)	X^2=3.21, p=0.36
% scoring 8–19		63 (45.3%)	53 (48.6%)	
% scoring 20 or more		28 (20.1%)	24 (22.0%)	
Unknown/not answered		9 (6.5%)	2 (1.8%)	

*RTD = ready-to-drink pre-mixed alcoholic beverage.

Table 3: Comparison of alcohol-related measures between waves: alcohol-related* participants only.

	Data collection wave			
	2013	**2017**	**2022**	**Statistical test***
All participants	164	139	109	
Alcohol-related* participants	116 (70.7%)	96 (69.1%)	68 (62.4%)	X^2=2.21, p=0.33
Standard drinks consumed in index drinking episode: n (%)				
<5	15 (12.9%)	3 (3.1%)	11 (16.2%)	**X^2=26.57, p<0.01**
5–9	24 (20.7%)	36 (37.5%)	20 (29.4%)	
10–14	22 (19.0%)	18 (18.8%)	14 (20.6%)	
15–19	22 (19.0%)	10 (10.4%)	4 (5.9%)	
20+	33 (28.5%)	24 (25.0%)	18 (26.5%)	
Unknown	0 (0.0%)	5 (5.2%)	1 (1.5%)	
Standard drinks				
Median (IQR)	14 (8–21)	11 (8–20)	10 (6–23)	X^2=1.19, p=0.55
Consumption over guidelines				
No	15 (12.9%)	5 (5.2%)	13 (19.1%)	**X^2=14.1, p=0.01**
Yes	101 (87.1%)	86 (89.6%)	54 (79.4%)	
Unknown	0 (0.0%)	5 (5.2%)	1 (1.5%)	
Injury-related attendance: n (%)				
	62 (53.5)	61 (63.5%)	39 (57.4%)	X^2=2.20, p=0.33
Source of alcoholic beverage(s): n (%)				
On-licence	14 (12.1%)	10 (10.4%)	10 (14.7%)	X^2=4.81, p= 0.57
Off-licence	81 (69.8%)	74 (77.1%)	46 (67.7%)	
Both	21 (18.1%)	11 (11.5%)	12 (17.7%)	
Other or unknown	0 (0.0%)	1 (1.0%)	0 (0.0%)	
Off-licence purchase: n (%)				
Liquor store	Not available	60 (62.5%)	33 (48.5%)	X^2=6.25, p=0.18
Supermarket		13 (13.5%)	17 (25.0%)	
Other/unknown/multiple		13 (13.5%)	8 (11.8%)	
Place last drink consumed: n (%)				
Private location	75 (64.7%)	65 (67.7%)	47 (69.1%)	X^2=8.63, p=0.37
On-licence venue	35 (30.2%)	20 (20.8%)	16 (23.5%)	
Unlicenced public location	4 (3.5%)	5 (5.2%)	3 (4.4%)	
Other or unknown	2 (1.7%)	6 (6.3%)	2 (2.9%)	

Table 3 (continued): Comparison of alcohol-related measures between waves: alcohol-related* participants only.

Type of alcoholic beverage(s) being consumed: n (%)				
Beer	27 (23.3%)	26 (27.1%)	15 (22.1%)	X^2=5.56, p=0.70
Wine	16 (13.8%)	16 (16.7%)	11 (16.2%)	
Spirits	19 (16.4%)	12 (12.5%)	8 (11.8%)	
RTDs**	14 (12.1%)	14 (14.6%)	5 (7.4%)	
Other/various	40 (34.5%)	28 (29.2%)	29 (42.7%)	
AUDIT score				
Median (IQR)	Not administered	15 (10–20)	14 (10–23)	X^2=0.01, p=0.92
% scoring <8		11 (11.5%)	10 (14.7%)	X^2=5.88. p=0.12
% scoring 8–19		53 (55.2%)	36 (52.9%)	
% scoring 20 or more		25 (26.0%)	22 (32.4%)	
Unknown/not answered		7 (7.3%)	0 (0.0%)	
Reason for ED presentation				
Motor vehicle accident	1 (1.0%)	5 (5.2%)	4 (5.9%)	**X^2=24.50, p=0.006**
Non-interpersonal trauma	45 (38.8%)	39 (40.6%)	28 (41.2%)	
Interpersonal trauma	16 (13.8%)	17 (17.7%)	7 (10.3%)	
Alcohol excess	9 (7.8%)	3 (3.1%)	12 (17.7%)	
Mental health/overdose	22 (19.0%)	7 (7.3%)	8 (11.8%)	
Medical/other	23 (19.8%)	25 (26.0%)	9 (13.2%)	

*Alcohol-related = those observed to be influenced by alcohol while in the ED, or those whose presentation was thought to be related to alcohol ("impact positive").
**RTD = ready-to-drink pre-mixed alcoholic beverage.

Towers et al. have previously found that over one third of older New Zealanders are drinking at levels that may result in harm.[27] People in this age group are more likely to have additional comorbidities and the potential for medication interactions, and despite participants drinking comparatively fewer standard drinks in the 2022 wave, they are still attending ED with alcohol-related issues. In addition, almost one quarter of presentations were during the daytime, and greater than a third were from Monday to Thursday. This is similar to findings from a study in Auckland, New Zealand,[7] but in contrast to Australian-based ambulance data suggesting that high-alcohol hours occur on Friday and Saturday evenings.[28]

Off-licence venues remain the primary source of alcohol purchases, and the site of alcohol consumption remains private venues (such as own home) for two thirds of those attending the ED with alcohol-related issues. This has policy implications as a greater focus needs to be on off-licence venues—particularly as a key supplier of large quantities of cheap alcohol—and on New Zealand drinking culture. It should also be noted that there is a significant proportion of patients in each wave in this study who have consumed 20 or more standard drinks in a single occasion, which

is extremely concerning. Addressing the high availability of off-licence outlets in communities is possible within a local alcohol policy. With the recent passing of the *Sale and Supply of Alcohol (Community Participation) Amendment Bill*,[29] councils can now implement strong controls on alcohol availability without the risk of alcohol industry appeals, particularly from alcohol retailers.

Limitations

This study had several limitations. Firstly, it must be emphasised that the numbers of participants included in each wave of this study are not comparable, and cannot be interpreted to indicate any change in the overall burden of alcohol-related presentations on EDs. The third wave of data collection for this study was delayed a year due to COVID-related lockdowns occurring in November 2021. However, COVID-19 continued to have a significant impact on EDs in 2022, and so participants were unable to be approached to take part in this study if they were unwell with COVID-like symptoms to reduce unnecessary risk to the medical students recruiting. At least partly related to COVID-19, there have been significant increases in all ED presentations around New Zealand in 2022 and ongoing, and so it was not feasible for a single student to approach every patient on a particular shift; therefore not all eligible participants may have been included.

Secondly, the participants in this study were often not sober. Those patients with the highest levels of intoxication were unable to consent to take part, and those who were able to take part may not have been able to answer questions accurately. This may introduce both sampling and recall bias. The assessment by the medical students of whether participants were intoxicated was also relatively subjective, despite the use of the Alcohol Intoxication Tool to guide classification,[22] as is the classification of whether a presentation was alcohol-related or not.

Thirdly, in 2013 and 2017 the demographics of those who consented to participate were compared to those who did not consent. This was not possible in 2022 as it was a requirement of the ethics committee that any data recorded were only for those patients who consented to answer the study questions.

Finally, we acknowledge that ED data on alcohol-related presentations is only one indicator of alcohol-related harm, and will not capture the full picture of community-level harm that is occurring in our population.

Conclusions

Over the three waves of this study, there has been a change in the age profile towards older patients attending the ED with alcohol-related issues. In 2022 there has been shift back towards on-licence alcohol purchase, although off-licence alcohol purchase and consumption in private locations remains the most common. The burden of alcohol-related harm to individuals can also cause impact on other patients, as morbidity and mortality increases for all patients in an ED when it's overcrowded. Given that alcohol-related presentations contribute to ED overcrowding, and are preventable, system-level preventative measures are required. It is highly important that EDs in New Zealand systematically collect alcohol-related data, which can inform a comprehensive approach including more widespread implementation of effective population-level alcohol policies to reduce excessive drinking and alcohol-related ED visits and the burden of alcohol use on the healthcare system.

COMPETING INTERESTS
None to declare.

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AUTHOR INFORMATION
Laura R Joyce: Senior Lecturer, Department of Surgery and Critical Care, University of Otago (Christchurch), New Zealand; Emergency Medicine Specialist, Emergency Department, Te Whatu Ora Waitaha, New Zealand.
Lana Cleland: Assistant Research Fellow, Department of Population Health, University of Otago (Christchurch), New Zealand; Assistant Research Fellow, Department of Psychological Medicine, University of Otago (Christchurch), New Zealand.
Elise Forman: Medical Student, Department of Surgery and Critical Care, University of Otago (Christchurch), New Zealand; Medical Student, Department of Population Health, University of Otago (Christchurch), New Zealand.
Alex Hlavac: Medical Student, Department of Surgery and Critical Care, University of Otago (Christchurch), New Zealand; Medical Student, Department of Population Health, University of Otago (Christchurch), New Zealand.
James Foulds: Associate Professor, Psychiatrist, Department of Psychological Medicine, University of Otago (Christchurch), New Zealand.
Rose Crossin: Senior Lecturer, Department of Population Health, University of Otago (Christchurch), New Zealand.

CORRESPONDING AUTHOR
Dr Laura Joyce: Department of Surgery and Critical Care, University of Otago Christchurch, 2 Riccarton Avenue, Christchurch, New Zealand. Ph: (03) 3640270.
E: laura.joyce@otago.ac.nz

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Should paediatric tonsillar asymmetry be an indication for tonsillectomy? A single centre experience

Georgia Mackay, Alina Rankin, Sheneen Meghji, Craig McCaffer

ABSTRACT

BACKGROUND: Paediatric tonsillar lymphoma (TL) is a rare diagnosis. Historically, the presence of clinical features such as tonsillar asymmetry, grossly abnormal tonsil appearance and cervical lymphadenopathy raise concern for this diagnosis. Tonsillar asymmetry is considered to be the most concerning clinical feature; however, asymmetry is often apparent due to differences in depth or shape of tonsillar fossa and tonsillar pillars, rather than a true difference in volume. There is debate whether a tonsillectomy is required in all cases of tonsil asymmetry to exclude lymphoma, and what clinical features should raise concern. The aim of this study was to establish whether the presence of clinical asymmetry can be deemed a reliable marker for genuine tonsil size discrepancies. We also sought to evaluate the clinical and examination characteristics that are concerning for lymphoma.

METHODS: Retrospective review of clinical records for paediatric tonsil specimens sent for histological evaluation between 1 January 2012 and 1 January 2023 driven by a clinical suspicion of lymphoma at Starship Children's Hospital, New Zealand. Patient demographics and clinical data were recorded. A comparison was made between tonsil size asymmetry on clinical examination (Brodsky criteria) and tonsil volume difference based on dimensions given in pathology reports.

RESULTS: One hundred and forty-three patients had tonsillectomies between 2012 and 2022 at Starship Children's Hospital due to concern for lymphoma. Of these, three were positive for lymphoma. Presence of pain and abnormal tonsil appearance were predictors for lymphoma ($p<0.02$). Interrater reliability agreement between clinical size difference and tonsil volume was poor, Kappa= -0.13 $p<0.05$.

CONCLUSION: Clinical size difference is a poor predictor for true tonsil volume difference. We advise that assessment of tonsil size should be performed in conjunction with the examination of gross visual abnormalities and lymphadenopathy to guide clinical decision making.

Paediatric tonsillar lymphoma (TL) is a rare diagnosis. Historically, a clinical examination finding of tonsillar asymmetry has been associated as a "red flag" for TL, and, as such, many children in our centre undergo tonsillectomy based on asymmetrical tonsillar size during clinical assessment.[1] Aside from size asymmetry, other features have been associated with TL, including rapid enlargement in size of tonsil, grossly abnormal appearance (colour, shape), immunosuppressed populations and presence of cervical lymphadenopathy.[1–3]

Lymphoma accounts for 12% of malignancy in children.[4] The most common lymphoma occurring within Waldeyer's ring is non-Hodgkin's lymphoma (NHL).[2] The most common NHL subtypes found in children are Burkitt lymphoma, followed by diffuse large B-cell lymphoma (DLBCL). Both are aggressive malignancies, making early diagnosis a key factor in influencing survival rates.[3,5]

There are no strict international guidelines recommending tonsillectomy for clinical size asymmetry alone.[5] However, tonsillar asymmetry continues to be a well-recognised indication for tonsillectomy both globally and in our centre. Presumably, this is due to the significance of a delayed diagnosis of lymphoma weighed against relatively low rates of complications following tonsillectomy.

However, clinical examination techniques of tonsillar size are based on examination of the exophytic portion of the tonsil only, such as the Brodsky criteria.[6] As such, asymmetry in size is often apparent due to differences in depth or shape of tonsillar fossa and tonsillar pillars, rather than a true difference in volume between the two tonsils.[2]

The aim of this retrospective case series is

to evaluate the accuracy of examination-based tonsillar asymmetry compared with true volumetric differences. We seek to establish whether the presence of clinical asymmetry can be deemed as a reliable marker for genuine tonsil size discrepancies (volume difference), thereby warranting tonsillectomy in these patients. In addition, we aim to identify any risk factors or protective factors associated with paediatric TL from history and clinical examination. These findings will serve to enhance the clinical assessment of paediatric patients who exhibit features of concern and help clinicians make more informed decisions regarding the need for tonsillectomy.

Methods

Data were obtained from the Starship Child Health (SCH) Clinical Records department following institutional approval through the SCH Research Office. Records were obtained for all patients who underwent a tonsillectomy or tonsil biopsy by ORL between 1 January 2012 and 1 January 2023. Patients were included in analysis if tonsil tissue was sent for histological analysis due to clinical concern for lymphoma. Patients with tonsil biopsy and formal tonsillectomy were included. Patients were excluded if the indication for histology was not due to a clinical concern for malignancy. Clinical concern for lymphoma was determined by documentation of presence of tonsillar asymmetry in size (difference of equal to or greater than 1 Brodsky grade between sides), abnormal appearance of tonsil tissue (asymmetry in shape, colour), abnormal palpation consistency, presence of B symptoms or cervical lymphadenopathy. The following demographic data were collected: age, sex and ethnicity. Ethnicity categories were NZ European, Māori, Asian, Pacific peoples and other. Clinical data for lymphoma association analysis included concurrent history of recurrent tonsillitis, sleep disordered breathing (SDB), type B symptoms, clinical examination findings and viral serology.

Outcome data included histology results and volume of tonsils. Tonsil volume was determined using dimensions provided in the pathology report, assuming a roughly cuboidal shape for each tonsil: length x width x height (mm). Tonsil volume difference was determined by the volume difference between sides. Tonsil volume was only calculated in patients who underwent bilateral tonsillectomy. Clinical size asymmetry was calculated by subtracting the Brodsky grade difference between left and right tonsil. We compared clinical size asymmetry with volume difference.

Statistical analysis

Patients' demographics and clinical characteristics were summarised using descriptive statistics. Chi-squared test was applied to examine the association between histology and patient factors. Spearman's coefficient was used to detect for correlations between clinical size difference and volume difference. With our sample size (n=91), we were powered to detect a small to moderate correlation between these two variables (r=0.27), assuming a power of 80% and alpha (type I error) of 0.05. Interrater reliability testing using Kappa was used to evaluate the level of agreement between clinical size difference and volume difference. To facilitate interrater reliability testing, volume difference was divided into four categories using quartiles, with the median as the central dividing point. A two-tailed p-value <0.05 was regarded as statistically significant. Statistical analyses were carried out using SAS 9.4 (SAS Institute Inc., Cary, NC, USA.) and SPSS 28 (SPSS, IBM, USA).

Results

A total of 143 patients had tonsillectomy or tonsillar biopsy at SCH between 1 January 2012 and 1 January 2023 due to clinical concern for paediatric tonsillar lymphoma. Patients were more commonly male (61.5%) and of NZ European ethnicity (41.3%), with a mean age of 7.2 years (SD 4.2). Patient demographics are summarised in Table 1. Twenty-two patients (14.8%) had tonsillar biopsy (18 of these were in combination with coblation tonsillectomy) and 113 had excisional tonsillectomy (76.3%). The remaining 13 had no operation note available (8.8%).

Clinical concern for possible malignancy was the primary reason for tonsillectomy or tonsillar biopsy in all 143 patients subject to analysis. The primary reason for lymphoma concern was clinical size asymmetry in 113 (79.0%) cases. Additionally, 35 (24.5%) patients were noted to have cervical lymphadenopathy, 42 (29.4%) had abnormal appearance of the tonsils (colour, shape, texture), seven (4.5%) had abnormal palpation, four (2.8%) had weight loss and five (3.5%) had night sweats. These findings are further characterised in Table 2.

There were three confirmed diagnoses of lymphoma in our series—one case of DLBCL, one with high-grade B-cell lymphoma and one case

of Burkitt lymphoma. The remaining histology results were benign.

Figure 1 compares clinical size asymmetry to volumetric difference for the 91 patients included in this analysis. Two of the three lymphoma cases were in this analysis, and both had large differences in volumetric difference between tonsils (represented on the graph as the two most significant volume difference outliers). The Spearman's correlation coefficient for clinical size difference and volume difference was -0.1 p=0.36. The Kappa value of overall agreement between clinical size difference and volume difference was -0.13 p<0.05.

Figure 1 shows the comparison of clinical tonsil asymmetry, as defined by a difference in Brodsky grades, compared with a volumetric difference (mm^3) of tonsils based on histology results. The two statistical outliers in "1 grade difference" and "2 grades difference" represent the patients who had a diagnosis of lymphoma, further highlighting how abnormal they appeared compared to the larger population.

Discussion

Paediatric tonsillar lymphoma is a rare but serious diagnosis in the paediatric population.[4] Our results, like previous studies, emphasise the rarity of paediatric tonsillar lymphoma, with only three diagnoses of lymphoma over an 11-year period.[3,4,7] Features of clinical size asymmetry, abnormal appearance and cervical lymphadenopathy are among the "red flag" features for TL.[4] While typically present in TL, tonsillar asymmetry is also relatively common in benign tonsillar pathology.[1] The decision for tonsillectomy in children with tonsillar asymmetry alone is a topic of debate among otolaryngologists. Many do not recommend routine tonsillectomy for children with tonsillar size asymmetry in the absence of other concerning features, due to high rates of benign tonsillar asymmetry in children.[1–3]

Tonsil asymmetry is over-diagnosed in patients due to variability in tonsillar fossa shape and depth creating the appearance of asymmetry.[8] Despite multiple criteria assessing clinical size asymmetry, in our literature search we found no criteria for determining clinically significant tonsillar volume difference after excision.[8] As such, we calculated a difference in tissue volume and compared this to a difference in Brodsky grades as a crude measure to assess clinical accuracy at determining size asymmetry.

With our study numbers we would be able

Table 1: Patient demographics.

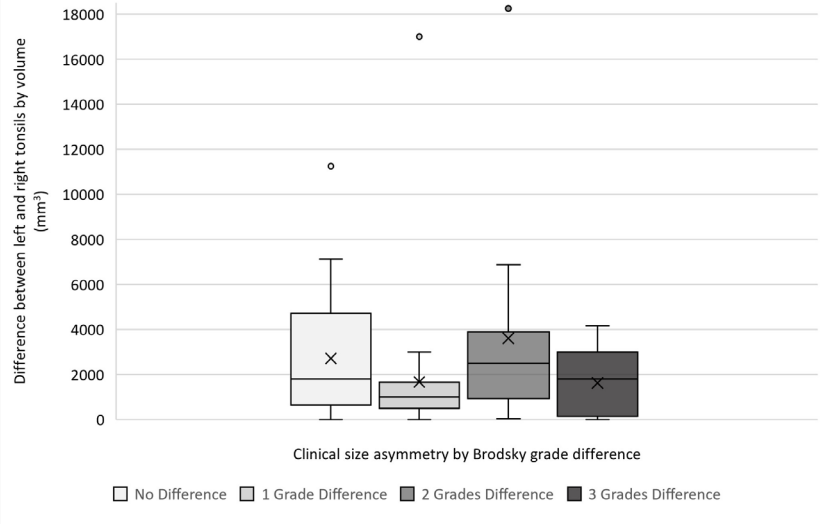
Demographics	
Age	**Years**
Mean (SD)	7.2 (4.2)
95% CI	6.5–7.9
Range	0.9–16.6
Gender	**N (%)**
Female	55 (41.3%)
Male	88 (61.5%)
Ethnicity	
NZ European	59 (41.3%)
Māori	21 (14.7%)
Pacific peoples	24 (16.8%)
Asian	22 (15.4%)
Other ethnicity	17 (11.9%)

Table 2: Clinical presentation in patients with concern for tonsillar lymphoma.

	Histology			
	Benign: n=140	**Lymphoma: n=3**	**Total n=143**	**P-value**
Symptom:				
Recurrent tonsillitis	45 (32.1%)	2 (66.7%)	47 (32.9%)	0.25
Sleep disordered breathing	94 (67.1%)	2 (66.7%)	96 (67.1%)	0.99
Pain	35 (25.0%)	3 (100%)	38 (26.6%)	**0.02***
Weight loss	4 (2.9%)	0 (0%)	4 (2.9%)	0.99
Night sweats	5 (3.6%)	0 (0%)	5 (3.6%)	0.99
Fatigue	21 (15.0%)	2 (66.7%)	23 (16.1%)	0.07
Clinical signs:				
Asymmetry on exam	110 (78.6%)	3 (100%)	113 (79.0%)	0.99
Difference in Brodsky grade				
1 grade difference	32 (22.9%)	1 (33.3%)		
2 grade difference	19 (13.5%)	1 (33.3%)		
3 grade difference	8 (5.7%)	0 (0.0%)		
Cervical lymphadenopathy				
Present	33 (23.6%)	2 (66.7%)	35 (24.5%)	0.21[+]
Not documented	67 (47.9%)	1 (33.3%)	68 (47.6%)	
Abnormal appearance	39 (27.9%)	3 (100%)	42 (29.4%)	0.02*
Palpation				
Abnormal on palpation	6 (4.3%)	1 (33.3%)	7 (4.9%)	0.35[+]
Not documented	121 (86.4%)	2 (66.7%)	123 (86.0%)	
Serology:				
EBV				
Positive	14 (10.0%)	1 (33.3%)	15 (10.5%)	0.50[+]
Negative	5 (3.6%)	1 (33.3%)	6 (4.2%)	
Not tested	121 (86.4%)	1 (33.3%)	122 (85.3%)	
HIV				
Positive	0 (0%)	0 (0%)	0 (0%)	
Negative	16 (11.4%)	2 (66.7%)	18 (12.6%)	
Not tested	124 (88.6%)	1 (33.3%)	125 (87.4%)	

*Statistically significant result
[+]Data not documented excluded from analysis

Figure 1: Clinical tonsil asymmetry by Brodsky grade compared to difference in volume between tonsils on histology.



to expect to detect at least a weak to moderate correlation between variables by Spearman's testing if there was a correlation present. In our study, the combination of Spearman's coefficient (-0.1) $p>0.5$ and Kappa value (-0.13) $p<0.05$ suggest at most a very weak correlation between clinical size difference and volume difference, but in a negative direction, which is contradictory to what we would expect clinically. The low Kappa value and lack of a statistically significant Spearman's coefficient suggest that there are significant discrepancies between these variables; this point is further highlighted by the graph in Figure 1.[9] As such, we have shown that clinical assessment is likely to be a poor predictor of true tonsillar volume asymmetry and advise that decision making around tonsillectomy should not be based solely on Brodsky grading asymmetry. These results are consistent with other literature whereby depth and shape of tonsil fossa can cause apparent differences in size, as Brodsky grading is chosen based on the exophytic portion of the tonsils only.[6]

Previous studies have suggested basing tonsillectomy criteria on clinical tonsil size difference of >2 on the Brodsky scale; however, by using this criterion we would have missed one of our lymphoma cases who only had a one-point Brodksy grade difference on clinical exam.[3] This patient had a large volume difference between tonsils, despite only a 1 Brodsky grade difference, which further highlights the inaccuracies between clinical examination of tonsillar size and true volume asymmetry on histological analysis. We noted that the two lymphoma patients included in the volumetric analysis were significant outliers in terms of tonsillar volumetric asymmetry (as seen in Figure 1). While clinical examination may not be a good indicator of tonsillar volume, other studies have suggested that the use of tonsillar ultrasound could be used to determine true tonsillar asymmetry.[10,11]

All three lymphoma cases in our study presented with asymmetrical-sized tonsils, and in all cases the affected tonsil had a markedly abnormal appearance (discolouration and shape). Two of the three had cervical lymphadenopathy. In our study, risk factors associated with lymphoma diagnosis were the presence of pain ($p<0.02$) and abnormal appearance of tonsil ($p<0.02$) (shape, colour). A systematic review of paediatric TL recommends high suspicion for TL in children with asymmetrical tonsils, combined with cervical lymphadenopathy or an abnormal tonsil appearance.[4] Case series and review articles similarly note a high presence of these features in TL cases.[1–4,12]

Night sweats and weight loss were not present in any of our lymphoma cases. Due to the small numbers of lymphoma seen in our study, it is difficult to draw statistical conclusions from these results; however, these findings are consistent with the wider literature. Berkowitz et al. reported B symptoms in less than 30% of TL cases, and Dolev et al. reported no B symptoms present in their six reported TL cases.[1,12] The existing

literature recognises that B symptoms are less frequently observed in cases of NHL than in those with Hodgkin's lymphoma.[4] A review of 66 cases of paediatric TL reported low rates of B symptoms (9% of cases with weight loss and 10% of cases with fevers).[4] Therefore, basing tonsillar asymmetry tonsillectomy criteria on the presence of B symptoms alone could result in failure to identify TL cases.

Studies suggest recurrent tonsillitis and SDB to be important criteria; however, these recommendations appear less often.[1,5] In our study, recurrent tonsillitis was present in 32.1% of benign pathology and 66.7% of TL. SDB was present in 67.1% and 66.7% of benign and TL cases respectively. While features of recurrent tonsillitis and SDB can be present in TL, they present with similarly high prevalence in benign pathology, and may be less useful in determining clinical suspicion of TL. Recurrent tonsillitis and SDB are independent factors for tonsillectomy.[5] When these symptoms are combined with asymmetrical tonsils, it may guide clinicians to perform biopsies or use tonsillectomy techniques that promote tissue preservation for histological evaluation.

From the results of our study, we also suggest that clinical size difference should not be a hard indication alone for tonsillectomy in the absence of other concerning features. Due to the rarity of paediatric TL and the inaccuracy of clinically diagnosed tonsillar size asymmetry, we believe that clinical size difference alone could result in unneeded tonsillectomies, or in some cases even stand to miss cases of TL. Instead, we suggest a more holistic approach to assessment based on colour, palpation and shape in conjunction with size to be a better indicator of potential lymphoma.

There were several limitations with this study. In cases where pertinent clinical findings were not documented, it was assumed that these patients had negative findings. As all patients were assessed by the ORL department it was assumed that patients were examined adequately, and that the presence of these findings would have warranted documentation. It is possible that we underestimate the prevalence of some clinical findings. Furthermore, due to the rare prevalence of TL, statically significant comparison between benign and lymphoma groups was limited. However, the trends displayed in our study mirror current international data. Our assessment of tonsillar volume was based on a simplified assumption of a cuboidal shape and did not consider potential variations in tonsil shape. Similarly, variations in dissection technique, resulting in over or under dissection of the tonsil tissue could not be accounted for. Additionally, while we acknowledge the likelihood of tonsil volume reduction following its removal from the blood supply, we assumed that this reduction would be uniform across both tonsils within the same patient. However, if there were discrepancies between the vascular supply between tonsils within the same patient, they may have impacted volumetric assessment. We do recognise that with our study numbers we could have potentially missed a very weak correlation between tonsillar volume difference and clinical size difference in our Spearman's testing; however, a weak correlation is unlikely to have any clinical significance in this context.

In conclusion, TL is a rare but important differential diagnosis in children and is the concern in a child presenting with tonsils of asymmetrical sizes. In our centre many patients undergo tonsillectomy for clinical assessment of size asymmetry alone. Our study has shown accuracy of clinician-based assessment of tonsillar asymmetry is a poor indicator for true tonsillar size difference. We therefore advise caution in basing decision for tonsillectomy off a difference in Brodsky grade alone. Instead, we advise assessment of size in conjunction with features of gross visual abnormalities (including colour, shape and size), pain and lymphadenopathy to guide clinical decision making. It is also possible that a preoperative radiological volumetric assessment of tonsil size may be a potential future tool worth investigating to determine true tonsillar volume asymmetry preoperatively.

COMPETING INTERESTS
None to declare. The corresponding author is not a recipient of a research scholarship. The data have been verbally presented at the South Pacific ORL Forum 2023. Research data are not shared due to privacy or ethical restrictions.

AUTHOR INFORMATION
Georgia Mackay, MBChB (non-set ORL registrar): Department of Otolaryngology, Auckland City Hospital, Te Whatu Ora Te Toka Tumai Auckland, New Zealand.
Alina Rankin, BSc, MBChB (non-set ORL registrar): Department of Otolaryngology, Auckland City Hospital, Te Whatu Ora Te Toka Tumai Auckland, New Zealand.
Sheneen Meghji, MBChB, MRCS (ENT) (ORL surgeon): Department of Otolaryngology, Starship Children's Hospital, Te Whatu Ora Te Toka Tumai Auckland, New Zealand.
Craig McCaffer, MBChB, FRCS (Otolaryngology) (ORL surgeon): Department of Otolaryngology, Starship Children's Hospital, Te Whatu Ora Te Toka Tumai Auckland, New Zealand.
GM and AR contributed to the manuscript equally as co-first authors. GM investigation (lead), formal analysis, writing—original draft; AR investigation (lead), formal analysis, writing—original draft; SM investigation (supporting), conceptualisation, methodology, writing—review and editing; CM conceptualisation, writing—review and editing, supervision.

CORRESPONDING AUTHOR
Dr Georgia Mackay: Department of Otolaryngology, Auckland City Hospital, Te Whatu Ora Te Toka Tumai Auckland, 2 Park Road, Grafton, Auckland 1023.
E: georgiamac@adhb.govt.nz

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Differences in life expectancy within and between countries: implications for domestic TAVI guidelines in Australia and Aotearoa New Zealand

Thomas D Ryan, Jonathon B Ryan

ABSTRACT

The advent of transcatheter aortic valve implantation (TAVI) has caused a paradigm shift in the management of aortic stenosis away from traditional surgical aortic valve replacement (SAVR). However, uncertainty remains about the long-term (>10 year) durability of TAVI valves, especially in younger patients. This viewpoint collates life expectancy data from Australia and Aotearoa New Zealand to propose sex-specific age-based recommendations for choice of SAVR versus TAVI in their respective general populations and among Aboriginal and Torres Strait Islander people in Australia and both Māori and Pacific peoples living in Aotearoa New Zealand.

The *2020 ACC/AHA Guideline for the Management of Patients with Valvular Heart Disease* expresses its recommendations for bioprosthetic aortic valve replacement in terms of both age and life expectancy.[1] Specifically, surgical aortic valve replacement (SAVR) is recommended for patients who are <65 years of age and for older patients with a life expectancy >20 years. Transcatheter aortic valve implantation (TAVI) is recommended for patients who are >80 years of age and for younger patients with a life expectancy <10 years. Shared decision making is recommended in the grey zone in between (age 65–80 and life expectancy 10–20 years). The accompanying synopsis and recommendation-specific supportive text make it clear that the life expectancy-based recommendation is the primary recommendation. This reflects the fact that life expectancy modulates the risks associated with the uncertainties of TAVI valve durability. The breakpoints in the age-based recommendation are derived by applying the life expectancy-based recommendation to life expectancy data for the United States of America's unisex general population and are only included to make discussion of the issue of life expectancy more accessible to patients during shared decision making. The *2021 ESC/EACTS Guidelines for the management of valvular heart disease* takes a similar approach, emphasising that it uses age as a surrogate for life expectancy, which it notes varies widely across the world.[2]

The aim of the study reported in this viewpoint was to collate life expectancy data for Australia and Aotearoa New Zealand for the purpose of generating sex-specific age-based criteria for use in any future domestic TAVI guideline. Life expectancy data for the United States of America and the European Union were also collected to better contextualise the existing international guidelines.

We obtained the life expectancy data from Life Tables published by the relevant government agency in each country.[3–7] To avoid the (hopefully) transient impact of the COVID-19 pandemic on the mortality rates that underpin the production of period Life Tables, we chose the most recent Life Table that had been derived from pre-2020 data. To generate age-based recommendations within each population studied, we identified the oldest age with a life expectancy >20 years and the youngest age with a life expectancy <10 years, which is consistent with the approach taken in the *2020 ACC/AHA Guideline for the Management of Patients with Valvular Heart Disease*.[1]

Sex-specific mean life expectancy at different ages for both the general population and the Indigenous sub-population of the countries studied is presented in Table 1.[3–7] (Equivalent data for Sámi people, the only recognised Indigenous ethnic group in Europe, was not available.) Notably, older Australians have a greater life expectancy than their peers in Aotearoa New Zealand, who in turn have a greater life expectancy than their

peers in Europe and America. In all countries, the life expectancy of males is less than the life expectancy of females of the same age. Similarly, the life expectancy of the Indigenous sub-population is less than the life expectancy of the general population. The gap between the life expectancy of Aboriginal and Torres Strait Islander people and the general population in Australia is greater than the gap between Māori and the general population in Aotearoa New Zealand, which in turn is greater than the gap between Pacific peoples living in Aotearoa New Zealand and the general population in Aotearoa New Zealand, which in turn is greater than the gap between American Indian or Alaska Native people and the general population in the United States of America. (It has previously been reported that among residents of northern Scandinavia and the Kola Peninsula, Sámi people are not socially disadvantaged, and their life expectancy is greater than the life expectancy of non-Sámi people.[8])

Sex-specific age-based recommendations for choice of SAVR versus TAVI for both the general population and the Indigenous sub-population

Table 1: Sex-specific mean life expectancy for general and Indigenous populations.

General population								
Country	**USA[3]**		**EU[4†]**		**NZ[5]**		**Aust[6]**	
Sex	M	F	M	F	M	F	M	F
Age 55	25.8	29.2	26.1	30.3	27.8	30.4	28.5	31.7
Age 60	21.9	24.9	22.0	25.8	23.5	25.9	24.1	27.1
Age 65	18.2	20.8	18.2	21.5	19.3	21.6	20.0	22.7
Age 70	14.7	16.9	14.7	17.4	15.4	17.4	16.1	18.4
Age 75	11.4	13.2	11.5	13.6	11.8	13.5	12.4	14.4
Age 80	8.5	9.9	8.6	10.1	8.6	9.9	9.2	10.7
Age 85	6.0	7.1	6.2	7.2	6.0	6.9	6.4	7.6
Indigenous sub-population								
Country	**USA—AI or AN[3]**		**NZ—Pacific[5]**		**NZ—Māori[5]**		**Aust—ATSI[7‡]**	
Sex	M	F	M	F	M	F	M	F
Age 55	22.8	26.7	24.1	26.8	23.0	25.3	22.9	24.9
Age 60	19.7	23.0	20.0	22.5	19.2	21.2	19.2	20.9
Age 65	16.7	19.5	16.2	18.5	15.8	17.5	15.8	17.1
Age 70	14.0	16.1	12.8	14.8	12.6	14.0	12.5	13.6
Age 75	11.3	13.0	9.9	11.4	9.8	11.1	9.6	10.3
Age 80	8.8	10.2	7.5	8.5	7.3	8.5	7.1	7.4
Age 85	6.7	7.8	5.5	6.3	5.4	6.4	4.4	4.5

USA = United States of America; EU = European Union; NZ = New Zealand; Aust = Australia; AI or AN = American Indian or Alaska Native; ATSI = Aboriginal and Torres Strait Islanders; M = Male; F = Female. All numbers are in years.
[†]For EU, reported age data for 85 are age cohort data: 85+; [‡]for ATSI, reported age data are age cohort data: 55–59, 60–64, 65–69, 70–74, 75–79, 80–84, 85+.

Table 2: Sex-specific age-based recommendations for choice of procedure in the general and Indigenous populations.

General population				
Country	**Sex**	**SAVR**	**SDM**	**TAVI**
USA[3]	Male	≤62	63–77	≥78
	Female	≤66	67–79	≥80
EU[4]	Male	≤62	63–77	≥78
	Female	≤66	67–80	≥81
NZ[5]	Male	≤64	65–77	≥78
	Female	≤66	67–79	≥80
Aust[6]	Male	≤65	66–78	≥79
	Female	≤68	69–81	≥82
Indigenous sub-population				
Country	**Sex**	**SAVR**	**SDM**	**TAVI**
USA—AI or AN[3]	Male	≤59	60–77	≥78
	Female	≤64	65–80	≥81
NZ—Pacific[5]	Male	≤59	60–74	≥75
	Female	≤63	64–77	≥78
NZ—Māori[5]	Male	≤58	59–74	≥75
	Female	≤61	62–77	≥78
Aust—ATSI[7†]	Male	≤55	60–70	≥75
	Female	≤60	65–75	≥80

Criteria for recommendations: SAVR—life expectancy >20 years; SDM—life expectancy 10–20 years; TAVI—life expectancy <10 years. USA = United States of America; EU = European Union; NZ = New Zealand; Aust = Australia; AI or AN = American Indian or Alaska Native; ATSI = Aboriginal and Torres Strait Islanders. All numbers are in years.
[†]For ATSI, reported age data age cohort data: 55–59, 60–64, 65–69, 70–74, 75–79, 80–84.

of the countries studied are presented in Table 2.[3–7] The biggest difference between the proposed recommendations and the existing guidelines is in the transition from SAVR to shared decision making (that is, the age from which TAVI is first considered a reasonable option). In the general population, Australian women, for example, should not be considering TAVI as an option until they are in their late 60s. In contrast, in the Indigenous sub-populations, both men and women should be allowed to consider TAVI as an option at much younger ages (until such time as more progress is made in closing the existing gap in life expectancy).

Discussion

Neither the Cardiac Society of Australia and New Zealand (CSANZ) nor The Australian & New Zealand Society of Cardiac & Thoracic Surgeons (ANZSCTS) have produced clinical practice guidelines to inform the choice between SAVR and TAVI. This is not unusual. The task of producing clinical practice guidelines has become increasingly

complex and is beyond the resources of professional organisations in smaller countries. Furthermore, the task is somewhat redundant, as the evidence base examined by the major international societies is broadly applicable to all advanced healthcare systems. Nonetheless, applying international guidelines to clinical practice in Australia and Aotearoa New Zealand does require some nuance. The TAVI guidelines[1,2] are a case in point.

The fact that older Australians and Aotearoa New Zealanders enjoy greater life expectancy than Americans and Europeans is not well known. As the gap is greater at age 65 than age 80, this has a greater bearing on the transition point from SAVR to shared decision making than the transition point from shared decision making to TAVI. Patients are understandably keen to be considered suitable for TAVI, but the life expectancy data indicates that Australians and Aotearoa New Zealanders should be more circumspect when assessing the risks associated with the uncertainties of TAVI valve durability.

The fact that women have greater life expectancy than men is generally well known, but the implications of that fact for the choice of SAVR versus TAVI is underappreciated.[9] The life expectancy data presented in this viewpoint clearly indicate that women generally, and Australian women especially, should favour SAVR over TAVI for longer than their male compatriots. This guidance, if adopted, would have implications for the interpretation of sex-based analyses of access to TAVI.

The fact that older Indigenous people suffer worse life expectancy than older non-Indigenous people in the same country is all too familiar. The gap is so wide in Australia that Aboriginal and Torres Strait Islander men should be allowed access to TAVI from age 55, 10 years earlier than the general population. This is in stark contrast to published reports that both Māori and Pacific peoples living in Aotearoa New Zealand[10] and American Indians/Alaskan Natives in North Dakota[11] do not have the same access to TAVI as non-Indigenous people. (The authors are unaware of any published data on access to TAVI for Aboriginal and Torres Strait Islander people compared to non-Indigenous Australians.)

It is important to appreciate that earlier access to TAVI is particularly relevant to Aboriginal and Torres Strait Islander people in Australia and both Māori and Pacific peoples living in Aotearoa New Zealand. The prevalence of rheumatic heart disease in these groups makes it more likely that they will require aortic valve replacement before the age of 65.[12,13] Notwithstanding the technical challenges associated with TAVI in the setting of rheumatic heart disease,[14] and the lack of head-to-head comparative outcome data for SAVR versus TAVI in Aboriginal and Torres Strait Islander people in Australia and both Māori and Pacific peoples living in Aotearoa New Zealand, the less invasive nature of TAVI is nonetheless inherently preferable. Māori in Aotearoa New Zealand have been shown to have worse outcomes than European people after surgery in general,[15] and cardiovascular surgery in particular,[15] including coronary artery bypass graft surgery specifically,[15,16] but also TAVI.[10] Similar trends have been reported in Pacific peoples living in Aotearoa New Zealand after surgery in general,[15] including after cardiovascular surgery,[15] and Aboriginal and Torres Strait Islander people in Australia after heart valve surgery.[17,18]

To summarise, the age-based recommendations contained in the international TAVI guidelines are based on American and European life expectancy data and so are not directly applicable to Australia and Aotearoa New Zealand. This viewpoint has collated the relevant local data to generate equivalent sex-specific age-based recommendations for Australia and Aotearoa New Zealand. In the general populations, the data favour raising the age from which TAVI is first considered a reasonable option, especially for women. In contrast, and more importantly, among Aboriginal and Torres Strait Islander people in Australia and both Māori and Pacific peoples living in Aotearoa New Zealand, the data favour significantly lowering the age from which TAVI is first considered a reasonable option, for both men and women.

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AUTHOR INFORMATION
Thomas D Ryan, BCom: Graduate Medical Student, Sydney Medical School, The University of Sydney, Sydney, NSW, Australia.
Jonathon B Ryan, MBBS MHPol PhD FRACS (General) FRACS (Cardiothoracic): Conjoint Senior Lecturer, Discipline of Surgery, Faculty of Medicine & Health, University of New South Wales, Sydney, NSW, Australia; Cardiothoracic Surgeon, Prince of Wales Hospital, Sydney, NSW, Australia.

CORRESPONDING AUTHOR
Dr Jonathon Ryan: Department of Cardiothoracic Surgery, Campus Centre Building, Prince of Wales Hospital, 320–346 Barker Street, Randwick NSW 2031, Australia. Ph: +61 412 225 138.
E: j.ryan@unsw.edu.au.

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The simple gallbladder with a twist?

Neeraj Khatri, Ahmed Abdile, Fraser Welsh, Nicholas Smith

Gallbladder volvulus (GV) is a rare phenomenon with fewer than 1,000 documented cases since it was first described by Wendel in 1898.[1,2] Clinical and physical manifestations of GV mimic acute cholecystitis, making diagnosis difficult. Radiological features such as a "beak and whirl" sign indicating cystic duct torsion and a horizontally oriented gallbladder support the diagnosis (Figure 1).[3] Given the low clinical incidence (one in 365,000 hospital admissions), diagnosis and treatment can be delayed, which can lead to peritonitis and septicaemia.[4] A falsely reassuring benign abdominal examination with only mild biochemical inflammatory changes has not been previously reported in literature with GV.

Case report

A 78-year-old female presented acutely to a rural hospital with 3 days of progressive periumbilical pain, nausea and reduced appetite. She denied fevers, melaena or vomiting.

Her medical history included breast cancer, osteoarthritis and multi-nodular goitre.

Her examination was relatively unremarkable. Her abdomen was soft, with a palpable fullness in the periumbilical region.

White cell count (14.7x109/L) and C-reactive protein (CRP; 21mg/L) were elevated on admission. Computed tomography (CT) scan demonstrated a grossly distended horizontal gall bladder (13cm) with adjacent free fluid (Figure 2). The torted appearance of the gallbladder neck suggested volvulus (Figure 1).

The patient was transferred to a major tertiary centre for definitive management. Acute laparoscopic cholecystectomy and intra-operative cholangiography (IOC) was performed. Intra-operative findings included gallbladder mucocele, distended down towards the umbilicus due to chronic cystic duct occlusion. There was a 360-degree clockwise volvulus with partial gallbladder necrosis on the inferior aspect (Figure 3). The gallbladder was suspended from the base of the liver by a mesentery. IOC demonstrated no filling defects. An uncomplicated cholecystectomy was completed within 100 minutes. The patient recovered well and was discharged home on day 4.

A 115x65x23mm dusky gallbladder containing calculi with a wall thickness of 8mm was seen. Microscopically, there were areas of mucosal ulceration, necrosis and congested vessels with reactive fibroblastic proliferation. There was no dysplasia.

Discussion

GV presentation can mimic other biliary and gallbladder pathologies, including biliary colic and calculous cholecystitis. Examination and laboratory investigation are often unable to distinguish between these respective pathologies. Conservative and antibiotic treatment can be explored in some biliary pathology. However, conservative treatment is less likely to be effective in GV due to progressive ischaemia and risk of perforation. Mortality associated with delayed recognition of GV is around 5% and is greatly reduced with prompt surgical intervention, preventing biliary peritonitis.[1] To avoid iatrogenic injury, careful intra-operative dissection is required as the common bile duct may be at the anterior margin of the liver when twisted.

A mobile mesentery between the liver and gallbladder is a prerequisite for organo-axial rotation. This anatomic variation is described in 1.3% of gallbladders.[5] Embryologically, the "floating gallbladder" has been hypothesised to be due to mismatched movement between the caudal bud and cranial bud, resulting in the gallbladder being suspended from the liver by its mesentery.[6] Risk factors include advanced age (seventh to eighth decade), excessive weight loss reducing the fat pad, and liver shrinkage, with the common feature being cholecystic visceroptosis.[7] Kyphoscoliosis increases the risk due to the more horizontal orientation of the gallbladder. Female:male ratio is 3:1. The rotation of the gallbladder leads to compromised blood flow, leading to infarction and gangrene of the gallbladder. A prompt cholecystectomy is indicated.[8]

In this rare presentation, the enlarged, torted gallbladder was not tender on examination, and only a mild inflammatory biochemical response was present. Delayed recognition of gallbladder

torsion can lead to gallbladder necrosis, rupture and biliary peritonitis. Clinicians should remain vigilant for the possibility of GV despite a reassuring clinical examination.

Figure 1: CT axial view showing "beak and whirl" sign indicative of cystic duct torsion.

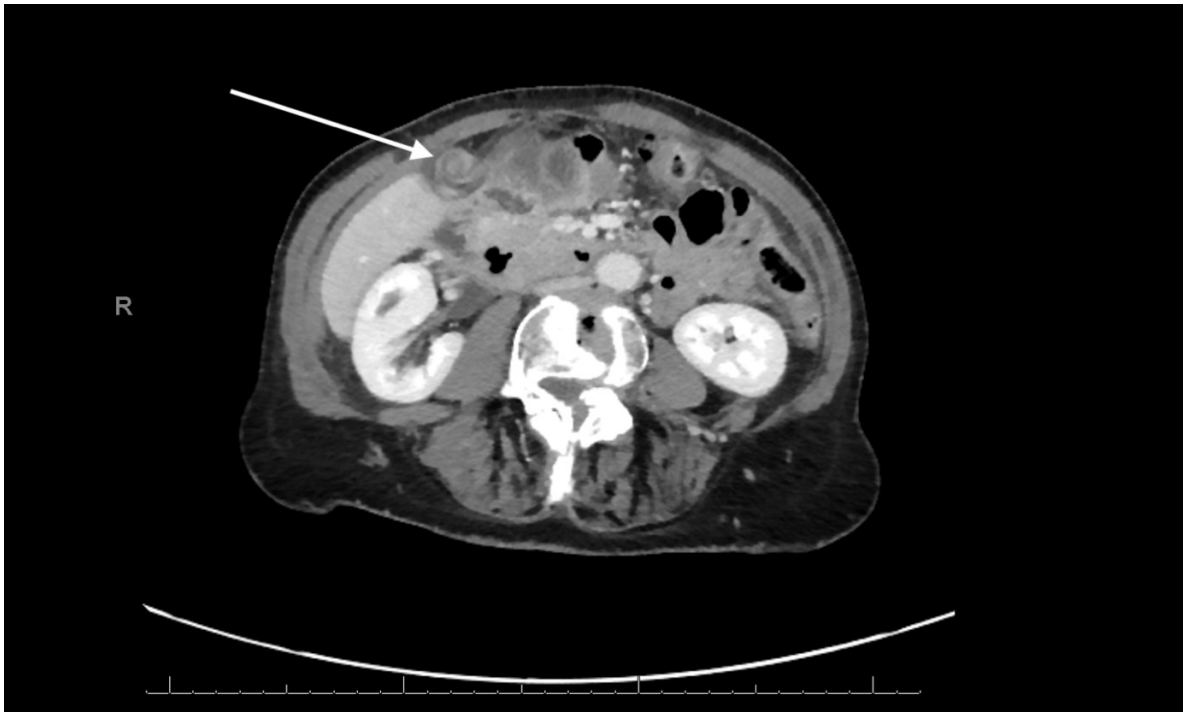


Figure 2: CT coronal view showing an enlarged gallbladder sitting outside of the gallbladder fossa. (A) Hartmann's pouch; (B) gallbladder fundus.

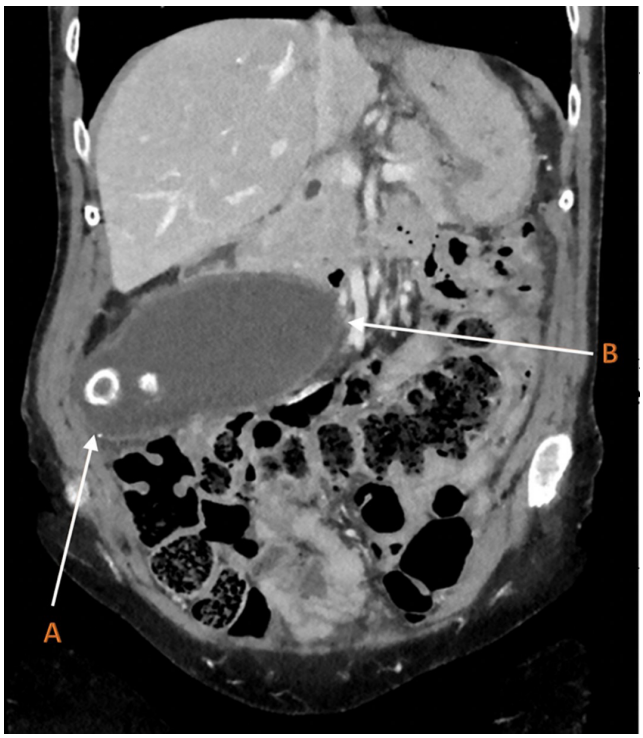
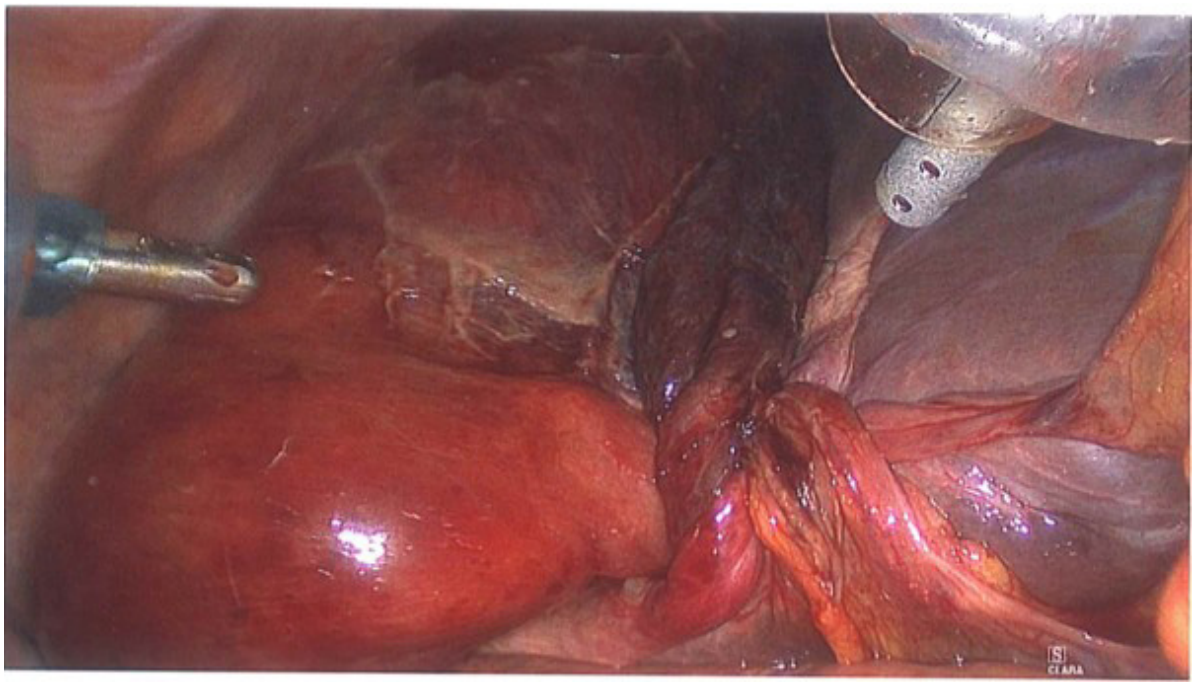


Figure 3: Intra-operative laparoscopy photography of torted gallbladder mesentery.



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Nil.

AUTHOR INFORMATION
Neeraj Khatri: Department of General Surgery, Waikato Hospital, Hamilton 3204, New Zealand.
Ahmed Abdile: Department of General Surgery, Waikato Hospital, Hamilton 3204, New Zealand.
Fraser Welsh: Department of General Surgery, Waikato Hospital, Hamilton 3204, New Zealand.
Nicholas Smith: Department of General Surgery, Waikato Hospital, Hamilton 3204, New Zealand.

CORRESPONDING AUTHOR
Neeraj Khatri: Department of General Surgery, Waikato Hospital, 53 Pembroke Street, Hamilton 3204, New Zealand. E: Neerajkhatri1@gmail.com

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Recreational ketamine use can lead to irreversible bladder damage

Daniel Eaton, Frank Kueppers

ABSTRACT

An increasing number of young patients with severe bladder overactivity syndrome potentially caused by recreational ketamine use has been treated in our department. Ketamine has become a popular and increasingly used recreational drug in New Zealand. Ketamine bladder syndrome has been reported internationally; however, local New Zealand data do not exist. It can lead to irreversible damage to the bladder, and internationally, surgical procedures like cystectomy and urinary diversion or augmentation cystoplasty have been reported as necessary treatments.

Ketamine is well recognised as a dissociative anaesthetic used primarily for the induction and maintenance of anaesthesia. It is also used in emergency medicine for procedural analgesia and acute pain management. More recently, psychiatry is using low-dose ketamine for treatment-resistant depression. Given these indications require only short-term use, the risks of long-term exposure have been unknown.

However, the dissociative and hallucinogenic effects of ketamine have led it to becoming increasingly popular as a recreational drug, a trend also observed in New Zealand. Unfortunately, we are now recognising several concerning side effects associated with this recreational use. One of these conditions is ketamine bladder syndrome. Other terminology for this condition includes ketamine (induced) cystitis or ketamine (induced) uropathy.

The purpose of this article is to raise awareness in the New Zealand medical community of this condition, given the growing popularity of recreational ketamine use. We will discuss what is known about the pathophysiology of ketamine bladder syndrome, the current data on recreational ketamine use in New Zealand and the latest literature on diagnosis and management of this condition. Finally, we will present a local case of a patient with ketamine bladder syndrome managed in our department.

Pathophysiology of ketamine and ketamine bladder syndrome

Ketamine is a N-Methyl-D-aspartic acid (NMDA) receptor antagonist, which blocks the excitatory neurotransmitter glutamate.[1] It may also interact with norepinephrine, serotonin, muscarinic and opiate receptors at central and spinal sites.[1] This induces analgesia and disrupts association pathways of the brain to produce dissociative anaesthesia.[1]

Therapeutically, ketamine is generally administered intravenously. However, since it is both water and lipid soluble it may be administered by several routes, including intramuscularly, intranasally, orally, sublingually or rectally, with varying bioavailability.[2] Once absorbed, the lipid solubility allows it to be rapidly distributed to the brain and body tissues.[2] Recreational ketamine is typically bought as a white powder and administered intranasally, with onset of effect within 15 minutes and duration up to 3 hours.[3]

Ketamine is metabolised in the liver. Ketamine and its metabolites are then excreted in the urine, largely as conjugates of hydroxylated ketamine metabolites with glucuronic acid (80%) and dehydronorketamine (16%).[2] The pathophysiology of ketamine bladder syndrome is still largely unknown, but it is hypothesised that these metabolites damage the urothelial cells, leading to disruption of the urothelial barrier.[4] Once this barrier is disrupted, a number of inflammatory cascades leads to inflammation and fibrosis, causing ketamine bladder syndrome.[4] These damages can occur in the bladder, leading to fibrosis and a poorly compliant bladder, as well as in the ureter, leading to ureteric stenosis or impaired ureteral peristalsis.[4] These changes can eventually lead to chronic kidney failure.[4]

Recreational ketamine use in New Zealand

Recreational ketamine was identified in New

Zealand as a potential concern in 2010 and added to the Misuse of Drugs order and classified as a Class C controlled drug.[5] This order immediately classifies a substance that may have a risk of harm to the public. This is the same status as drugs such as cannabis plants, barbiturates, codeine, coca leaf and benzylpiperazine. Despite this, the data available to ascertain the magnitude of recreational ketamine use remain limited.

We do know, however, that ketamine border seizure has significantly increased from 0.15kg in 2016 to 22kg in 2021.[6] Reports from Know Your Stuff NZ, a volunteer organisation that provides free clinics at events such as music festivals to test the purity of recreational drugs, show further support of increased recreational ketamine use. In 2016–2017, only four reports of ketamine use were noted, whereas in 2020–2021 this was up to 186.[7] New Zealand Police planned to introduce testing of ketamine and its metabolites in the wastewater in 2022, but in the most recent report in September 2023 it is yet to be reported.[6,8] Some concerns have been raised with possible confounding results by legal hospital and veterinary ketamine use.

Overall, these reports do suggest a serious and significant increase of recreational ketamine use in New Zealand. However, clearly data remain limited, and more objective monitoring of ketamine use is required.

Diagnosis of ketamine bladder syndrome

Ketamine bladder syndrome is a new entity, with the first reported cases in 2007.[9] Since then, with more awareness of the condition, more cases have been identified and more research into the area has occurred, leading to many studies being published. These have predominantly been case reports, rodent model trials or small retrospective studies. Over the last few years, several international systematic reviews have appraised the available literature.[4,10–12]

These have highlighted that the common symptoms of ketamine bladder syndrome are of the lower urinary tract. These include urinary frequency, urgency and nocturia, with associated dysuria or suprapubic discomfort.[4,11] In severe cases pain can be significant, and urinary incontinence or haematuria can be present.[4] The severity of the condition does appear to have a positive correlation with ketamine exposure in most studies.[4] Taking a recreational drug history is paramount.

Diagnostic investigations for this condition include urinalysis, usually with the presence of sterile pyuria, haematuria or raised eosinophils.[4] Radiological imaging may identify a small, contracted bladder with a severely thickened bladder wall, at times with disease extension into the ureter.[4,11] Ureteric dilation, vesicoureteral reflux and hydronephrosis may be present in severe disease.[11] Cystoscopy may show a thickened bladder wall with mucosal oedema and inflammation with or without ulceration.[11] As discussed previously, ketamine bladder syndrome leads to damage to urothelial lining, hence on histology epithelial denudation is seen.[11] Ulceration, petechial haemorrhage and infiltration of immune cells may be present throughout the layers of the bladder wall, with submucosal fibrosis and muscle hypertrophy also detected.[11]

The symptom profile for ketamine bladder syndrome is predominantly of bladder overactivity, and a number of differential diagnoses need to be assessed before a diagnosis of ketamine bladder syndrome is made. These include urinary infection, neurogenic bladder, diuresis conditions, stone disease and schistosomiasis. It is important to also exclude anatomical abnormality and carcinoma *in situ*, or bladder malignancy. All these conditions can be reviewed with a thorough history and examination followed by appropriate investigations, including urine analysis, radiological imaging and endoscopic procedures as required.

Treatment of ketamine bladder syndrome

Currently, there is no standardised approach to managing this condition. However, the evidence is clear that abstinence of ketamine is imperative to stop progression of this condition. This alone can be successful treatment for patients with early ketamine bladder syndrome and prevent long-term damage from this condition.[4,10,11] For patients with more severe conditions, symptoms may not fully recover, and can even progress despite abstinence.[4,11] This emphasises the importance of early diagnosis. Abstinence can be challenging for patients, and referral to support and drug services is essential.

In combination with ketamine cessation pharmacological therapy can be useful, with the aim to manage symptoms and reduce inflammation. Oral therapy, including non-steroidal anti-inflammatories such as diclofenac, and anticholinergics such as solifenacin, are used. Steroids, COX-II

inhibitors, neuropathic analgesia, and general analgesics including paracetamol and opioids, have also been trialled.[4,11] Pentosan polysulfate, used for interstitial cystitis and painful bladder syndrome, can give symptomatic relief.[4,9,11]

If symptoms are not controlled on oral therapy, then intravesical treatment can be given. This includes intravesical instillation of hyaluronic acid, which has been shown to be safe and can be effective, although a standardised regimen is not available.[4,11,13] Additionally, intravesical botulinum toxin combined with bladder hydrodistension has shown some effectiveness.[4] Several other therapies have been trialled in animal models.[4,11]

Finally, in severe conditions with significant intractable symptoms or structural abnormalities, surgical management may be required. Depending on the indication, surgical options can include urethral dilation, ureteric reimplantation, ileal conduit urinary diversion, augmentation cystoplasty with or without Mitrofanoff channels and cystectomy with neobladder.[4,11,12] These surgeries can involve high morbidity.[11,14]

Case report

Mr K is a 28-year-old Egyptian-born male, now resident in New Zealand. He presented in the community with urinary frequency, urgency, dysuria and a white urethral discharge. He received antibiotics for a presumed sexually transmitted infection. However, the presenting urine analysis returned negative for both sexually transmitted and urinary tract infections. Ongoing symptoms prompted a Urology Specialist review at Christchurch Hospital. A repeat urine analysis showed sterile pyuria and microscopic haematuria. He was commenced on oral ciprofloxacin 500mg twice daily and solifenacin 10mg once daily for overactive bladder symptoms. A travel history to Egypt was noted and schistosomiasis testing was negative. An ultrasound demonstrated no renal tract abnormality. Following completion of 3 weeks of ciprofloxacin, flexible cystoscopy was performed. Notably, very unusual erythematous patches were seen on the posterior bladder wall. This appearance raised concerns and a formal cystoscopy with biopsy under general anaesthetic was arranged. The urine cytology was sent to assess for malignancy.

Mr K presented two further times acutely due to ongoing urinary symptoms. He was not systemically unwell and urinary cultures were negative. The goals of care were symptoms' management. Variable combinations of therapies were trialled, including simple and anti-inflammatory analgesia such as paracetamol and diclofenac, opioid-based analgesia including codeine and morphine, anticholinergics including oxybutynin and solifenacin, and finally neuropathic medications including amitriptyline.

At elective cystoscopy, the findings were again notable, with numerous patchy erythematous areas on his bladder wall that bled easily on bladder filling. His bladder was generally inflamed and trabeculated. Multiple biopsies were taken, and haemostasis gained with roller ball diathermy.

The anaesthetic intra-operative notes remarked on the large opioid requirement for Mr K's anaesthesia. Post-operatively this prompted careful questioning with Mr K regarding the possibility of recreational drug use. This was the first documentation that he had been using ketamine 1g intranasally weekly for the last few years.

His biopsies demonstrated active chronic ulcerative cystitis. They showed extensively eroded and denuded lamina propria and detrusor muscle. The lamina propria was oedematous and congested containing inflammatory cells including eosinophil and had foci of fibrosis.

A diagnosis of ketamine bladder syndrome was made based on histology, in conjunction with a clear clinical history of recreational ketamine use, having excluded other differentials.

As reviewed in this article, the key to successful management of ketamine bladder syndrome is education and support to achieve long-term ketamine cessation. In the interim, given ongoing significant symptoms, Mr K was commenced on oral prednisone with an initial dose of 40mg weaned over 3 weeks. On Urology Outpatient review his urinary symptoms had significantly improved and he was only requiring simple analgesia. Importantly, Mr K self-reported ketamine abstinence. At the 6-month review, symptoms remained relatively well controlled, with only mild residual chronic pain. Unfortunately, he was now reporting intermittent ketamine use again, which highlights the difficulty with ketamine cessation. He appeared to understand the risk of cumulative bladder injury from ketamine use and was committed to continue to work on ketamine abstinence in primary care.

This local case serves to highlight several learning points we have discussed in this review. While uncommon, it does remain an important differential for a patient presenting with overactive bladder symptoms or suprapubic discomfort with

no identifiable cause. A recreational drug history is critical to raise the possibility of and then ultimately to secure the diagnosis of ketamine bladder syndrome. Furthermore, management is largely symptomatic in conjunction with long-term ketamine abstinence. This case emphasises the importance of community support for patients with the challenge of ketamine abstinence.

Learning points

Evidence suggests that recreational ketamine use in New Zealand is increasing. This increased use will be associated with more patients presenting with ketamine bladder syndrome. As such, it is important to be aware of the symptoms and signs of this condition, which include bladder overactivity and small bladder capacity. Recreational drug history is paramount, and if there is any concern for ketamine bladder syndrome, the patient should be strongly encouraged to stop using ketamine and should be referred to a drug support service and Urology. Early diagnosis and ketamine cessation are the primary management for this condition. There is currently no standardised approach for symptom control, but oral and intravesical therapies are available. Severe cases with intractable symptoms or structural abnormalities require urological review for assessment, investigation and consideration of surgical management.

COMPETING INTERESTS
Nil.

AUTHOR INFORMATION
Daniel Eaton: Urology Registrar, Urology Department, Waitaha Canterbury (CDHB), Christchurch, New Zealand.
Frank Kueppers: Dr med, Urologist, Urology Department, Waitaha Canterbury (CDHB), Christchurch, New Zealand.

CORRESPONDING AUTHOR
Daniel Eaton: Urology Registrar, Urology Department, Waitaha Canterbury (CDHB), Christchurch. Ph: 03 364 0640. E: Daniel.eaton@cdhb.health.nz.

URL
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Negotiating a competitive speciality programme interview—a Māori clinician perspective

Walston R Martis, Zanazir Alexander

Driven by a combination of limited training positions and highly skilled applicants, competition for speciality training programmes has never been so fierce. The interview becomes the ultimate hurdle prior to the start of speciality training, and failures are common, despite the exceptional calibre of the candidates on paper. Rather than a competition of competence, the interview becomes a competition of confidence. Although the robustness and transparency of these interviews may vary depending on the speciality, there is a unified drive to address systemic biases and institutional barriers to uphold the principles of Te Tiriti o Waitangi, working towards equitable healthcare outcomes among Māori.[1]

As per the 2023 Medical Council of New Zealand (MCNZ) workforce survey, 4.7% of doctors identified as Māori.[2] Considering that Māori make up 16.5% of the population, there is still much work needed to achieve a proportionate Māori medical workforce.[2] Recent years have seen a greater proportion of junior Māori clinicians interviewing for specialty training programmes, with a fair proportion being successful. Furthermore, there is a drive to establish parity for Māori surgeons by 2040.[3] Over the past few years we have seen many positive implementations, especially the development of statements and strategic plans from the various specialty colleges, aimed at improving Indigenous representation in our specialty workforce.[4–7] However, there may still be aspects of cultural disconnect while we aspire towards this parity.

Interviewers may not fully understand or appreciate the cultural background, experiences or challenges that Māori face, leading to misinterpretation or undervaluation of their competence. Furthermore, implicit biases, which have been founded upon by racist attitudes, may lead to interviewers holding preconceived notions about Indigenous clinicians in certain sub-specialties within medicine.[8] Cultural sensitivity has improved drastically in the last few years, with cultural awareness training being an integral part of medical education;[9] however, there is a lack of deep understanding, especially in the expected responses as part of the structured interview.

With confidence in cultural identity, there is a benefit of providing perspective by emphasising the positive impacts it has on patient care. Ties to the local Iwi not only demonstrate leadership and advocacy, but also commitment to improve healthcare outcomes for Māori. Some of these aspects may not have room to feature on a standard structured curriculum vitae, but they become exceedingly important when it comes to healthcare delivery to a marginalised population. The weighting of these in the interview process must be reflective of the healthcare needs of Aotearoa.

Negotiating an interview as a Māori clinician involves preparing to showcase not only skills, experiences and cultural perspectives, but also navigating these potential biases. Routing a path through these flawed interview structures is not something we should expect our Māori candidates to do, and preparation of our candidates with this aim in mind will contribute towards institutionalised racism. Engagement and collaboration with Māori and Indigenous health stakeholders, including community members, Indigenous partner organisations and Māori health leaders, is necessary at every step of candidate selection, especially in the interview process. The specialty colleges need to work with Māori and Indigenous people to develop Indigenous affirmative measures, with a candidate selection strategy reflecting the current priorities of reducing healthcare inequity. One of these measures is reaching out to Indigenous communities to provide local representation in the interview panels to provide relevance and context. Not only will this be beneficial in preventing implicit bias in the interview structure and content, but it will also improve cultural sensitivity among the interview panel.

We can actively support our junior Māori and Indigenous doctors in their pursuit of competitive healthcare careers by abolishing the biased

nature of structured interviews. In doing so, we can address systemic issues that hinder representation in the respective fields. The interview is the first step towards a balanced workforce, and we must make this process transparent and conducive to the Māori applicant. We need to acknowledge these barriers in the selection process if we truly want to achieve a representative workforce.

COMPETING INTERESTS
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AUTHOR INFORMATION
Walston R Martis: Consultant Anaesthetist, Department of Anaesthesia, Perioperative and Pain Medicine, Peter MacCallum Cancer Centre, Melbourne, Australia; Consultant Anaesthetist, Department of Anaesthesia, Monash Health, Melbourne, Australia; Clinical Lecturer, Department of Critical Care, The University of Melbourne, Melbourne, Australia; Co-founder of iPrep Medical, Australia and New Zealand.
Zanazir Alexander: Senior Orthopaedic Registrar, Department of Orthopaedics, Hutt Hospital, Te Whatu Ora; Co-founder of iPrep Medical, Australia and New Zealand.

CORRESPONDING AUTHOR
Dr Walston Reginald Martis: Consultant Anaesthetist, Department of Anaesthesia, Perioperative and Pain Medicine, Peter MacCallum Cancer Centre, Melbourne, Australia; Consultant Anaesthetist, Department of Anaesthesia, Monash Health, Melbourne, Australia; Clinical Lecturer, Department of Critical Care, The University of Melbourne, Melbourne, Australia; Co-founder of iPrep Medical, Australia and New Zealand.
E: Walston.martis@petermac.org

URL
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Re: Epidemiology of giant cell arteritis in Waikato, Aotearoa New Zealand

Vitorino Modesto dos Santos, Taciana Arruda Modesto Sugai

ABSTRACT

The interest in epidemiological data on giant cell arteritis (GCA) increased both in New Zealand and in Latin America, resulting in updated articles like those here commented. Of more relevance are two very recent contributions by van Dantzig et al. with novel conclusive findings from their evaluations on GCA performed in the region of Waikato. The authors emphasised that the diagnosis of GCA remained stable in this region from 2014 to 2022, being uncommon among Māori, Pacific peoples and Asian ethnic groups. Short comments on some literature data from Argentina, Brazil, Colombia, Peru and Mexico about the systemic arteritis are here addressed to show the Latin American view. The authors strongly believe that this kind of report may enhance the general interest on diagnostic and management issues related to this very important systemic vasculitis.

Dear sir,

The interest in epidemiological data on giant cell arteritis (GCA) increased both in New Zealand and in Brazil, resulting in updated articles like those here briefly commented.[1–5] Of more relevance are two very recent contributions by van Dantzig et al. with novel conclusive findings from their evaluations on GCA performed in the area of Waikato.[1–2] The first report included 214 patients diagnosed with GCA between 2014 and 2022; near 94% were European, and Māori patients were of younger age groups. The mean yearly incidence was 14.7 per 100,000 people over 50 years, similar to previous data.[1] The authors emphasised that the diagnosis of GCA remained stable in this region during that span of time, and is uncommon in Māori, Pacific peoples and Asian ethnic groups.[1] The other report retrospectively evaluated results of the fast-track pathway set up among 648 patients with GCA who had colour Doppler ultrasound (CDUS) of temporal arteries; the true positive CDUS (n=17) presented a sensitivity of 10.3% and a specificity of 99.8%.[2] After the negative CDUS, 376 patients were discharged without diagnosis of GCA, and reduced exposure to corticosteroids or temporal artery biopsy; patients with GCA and positive scan used significantly fewer steroids than those with GCA and negative scan.[2] The authors stressed the benefits of fast-track pathways to the patient's healthcare, besides a favourable effect of corticosteroids among the patients with positive CDUS.[2]

In this setting, it seems appropriate to present short comments on some literature data from Argentina, Brazil, Colombia, Peru and Mexico about the systemic arteritis.[3–5] Worthy of note, the populations of these five countries also include European and Indigenous peoples. A cross-sectional study in six Brazilian states from 2015 to 2017 focussed diagnosis and classification of patients who had at least 6 follow-up months of Behçet disease (BD), Takayasu's arteritis (TA), GCA, polyarteritis nodosa (PAN), granulomatosis with polyangiitis (GPA), microscopic polyangiitis (MPA), eosinophilic granulomatosis with polyangiitis (EGPA) and cryoglobulinemic vasculitis (CryoVas).[3] In the Southeast region, the diagnoses among 1,233 patients were BD: 35%, TA: 26.4%, GPA: 16.2%, PAN: 5.8%, GCA: 5.8%, EGPA: 4.3%, MPA: 3.4% and CryoVas: 3%; in comparison, no cases of GCA were found in 103 vasculitis diagnosed in the Northeast.[3] A cross-sectional study included 562 patients over 18 years of age with systemic vasculitis and 6 months or more of follow-up; 345 of individuals were Brazilian and 217 were Peruvian.[4] The frequency of GCA was higher in Brazilians than Peruvians (9.8% vs 0.9%). Epidemiologic differences were observed in the frequency of systemic vasculitis between Brazilian and Peruvian cases, as the age at diagnosis of GPA was lower in Brazilians.[4] Due to the accentuated regional health disparities in the region related to socio-economic factors, specialists from the Pan American League of Associations for Rheumatology from Argentina, Brazil, Colombia, Mexico and Peru established the guidelines to treat GCA in Latin America, where the patients very often underwent an excess of glucocorticoids.[5] The nine recommendations and one expert opinion statement had 70% or over agreement, for

glucocorticoids, tocilizumab, methotrexate and aspirin to be utilised in the GCA.[5]

In conclusion, the aforementioned literature data aim to emphasise some epidemiological aspects of GCA, the most common idiopathic systemic vasculitis of the large- and medium-sized vessels, which mainly affects individuals over than 50 years of age, and the spectrum of phenotypes may be influenced by genetic and environmental factors.

COMPETING INTERESTS
Nil.

AUTHOR INFORMATION
Vitorino Modesto dos Santos, MD, PhD: Adjunct-professor of Internal Medicine, Armed Forces Hospital; Catholic University of Brasília-DF, Brazil.
Taciana Arruda Modesto Sugai, MD: American Society of Neurophysiology; Dermatologist of Brasília-DF, Brazil.

CORRESPONDING AUTHOR
Professor Vitorino Modesto dos Santos, MD, PhD: Armed Forces Hospital, Estrada do Contorno do Bosque s/n, Cruzeiro Novo, CEP: 70.658-900, Brasília-DF, Brazil. Ph: +55 61 3966 2103. E: vitorinomodesto@gmail.com

URL
www.nzmj.org.nz/journal/vol-137-no-1593/re-epidemiology-of-giant-cell-arteritis-in-waikato-aotearoa-new-zealand

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Changing the script: medicine optimisation recommendations made during proactive multidisciplinary meetings with older adults

Katherine Bloomfield, Joanna Hikaka, Julia Brookes, Annie Tatton, Cheryl Calvert, Zhenqiang Wu, Michal Boyd, Kathy Peri, Dale Bramley, Martin J Connolly

Medical science continues to reshape healthcare with an ever-increasing number of medications available to transform people's lives for the better, improving mortality, morbidity and, frequently, quality of life. Yet this increased longevity often comes with comorbidity, dependency and frailty. Polypharmacy is associated with increased comorbidities; in many cases a reflection of appropriate prescribing based on available evidence. However, polypharmacy and inappropriate prescribing, combined with the age-related changes in pharmacokinetics and pharmacodynamics, is associated with increased harm for older adults, including adverse drug reactions, falls, decreased quality of life and increased health system costs, among other adverse effects.[1] Due to these potential concerns, prescribing recommendations such as the STOPP/START guidelines are available to help facilitate appropriate prescribing in older adults.[2]

We recently performed a randomised controlled trial (RCT) of a proactive multidisciplinary (MD) intervention versus usual care in otherwise well retirement village residents in the Waitematā and Auckland areas, with the primary aim to reduce hospitalisations.[3,4] In this report we describe the medicine optimisation recommendations made during the MD meeting undertaken as part of the active arm of the RCT to highlight the significant number of potential medication changes present in otherwise well older people.

Details of the RCT methodology and outcomes are described elsewhere,[3,4] but in brief, relevant to this report, 173 residents participated in the active RCT arm, which included a meeting with individual participants in their own home and an older adult specialist research team (clinical pharmacist, geriatrician or nurse practitioner and gerontology nurse specialist [GNS]) to develop healthcare recommendations. Prior to the MD meeting, detailed health, functional and psychosocial information and clinical observations were recorded by research GNSs. Clinical pharmacists liaised with participants and performed a medicines reconciliation. At these contact points with participants, individual healthcare and medication-specific goals/issues of importance were recorded and brought to the MD meeting for wider discussion in context of overall health and wellbeing.

Recommendations made at meetings included those regarding medications/prescribing, investigations, specific advice to participants (e.g., exercise recommendations), referrals to other specialists/community teams and advice on on-going primary care monitoring. Recommendations were agreed with participants, formally written-up and provided to general practitioners and participants. Collaborative medicine-related recommendations were retrospectively reviewed to describe the number and type of (start/increase, stop/reduce) medication recommendations made at MD meetings and alignment with STOPP/START guidelines published at the time of intervention. The STOPP/START guidelines are one of several guidelines designed to assist clinicians in appropriate prescribing for older adults. They include criteria for stopping medications that are significantly associated with adverse drug reactions but also give advice on starting medications to ensure that older adults do not miss out on evidence-based treatment. Research shows that following such guidelines has practical clinical value by reducing adverse drug reactions and hospitalisations.[2]

The mean age of participants in MD meetings was 81 years, and 128 (74.0%) were female. In three (2%) MD meetings no specific recommendations were suggested. The most common

recommendations made were around prescribing, with 310 suggestions made for 135 (78%) of the participants, averaging 1.8 per participant. The most common medicines recommended to be stopped or reduced included statins (n=31), proton-pump inhibitors (PPI, n=20), diuretics (n=16), antiplatelet agents (n=10), tricyclics and diabetic medications (n=9 for both). The most common medicines recommended to be started or increased included paracetamol (n=29), vitamin D (n=14), topical analgesics (n=11), vaccinations (n=7) and bisphosphonates (n=6). Additionally, 11 recommendations were made around changing medications within a class or formulation; for example, changing oral bisphosphonates to intravenous. Of the recommendations made, 89 (28.7%) aligned with STOPP guidelines, 33 (10.6%) aligned with START guidelines and 188 (60.6%) were independent of STOPP/START guidance. Previous literature has shown STOPP/START alone may not be clinically appropriate in around 60% of cases.[5]

While there were a wide variety of prescribing recommendations made overall, those working clinically with older adults are probably not surprised that certain cardiac medications and PPIs were the commonest medicines recommended to be reduced or stopped. In particular, in the very old age group (>80 years) there is not strong evidence of benefit with antiplatelet treatment or statins for primary prevention, and many older adults were keen to reduce medication load. Recommendations regarding starting or increasing medications were predominantly around simple analgesic and bone protection, reflecting common issues of pain and osteoporosis in this age group; our previous work demonstrated 47% of this study population experience daily pain.[6]

This study sample was predominantly European (>96%) and therefore we are unable to comment on differences between ethnicities. However, previous literature demonstrates inequities in both access to medications and adverse outcomes associated with inappropriate prescribing for Māori.[7] This suggests that within the wider Aotearoa New Zealand population, addressing appropriate prescribing has even greater importance than demonstrated within this study.

Our work demonstrates that appropriate prescribing in otherwise well older adults who were not actively seeking health service input is a common area that can be improved. While formal clinical guidelines such as the STOPP/START guidance can help identify low-hanging fruit, an individualised, holistic approach to appropriate prescribing based on understanding patient needs and goals, and one supported by specialist knowledge, can lead to a multitude of further recommendations. A strength of this work was the participant-centred approach, which was one that was found to be acceptable to the participants.[8]

With this in mind, we strongly argue for increased presence of clinical pharmacists in primary care and greater collaboration and integration between primary care and specialist older adult services. Pharmacists have a critical but often invisible role to play in safe prescribing in older adults.[9] A recent study found that over 70% of general practices surveyed wished for more pharmacist support than currently available and that clinical pharmacists within primary care are well received by medical colleagues.[10] Additionally, there is wider supportive evidence for individualised and collaborative proactive care of older adults living with frailty.[11] A community model of care addressing appropriate prescribing within the context of patient-centred goals and holistic care, presence of scientific evidence and expert clinical judgement would have the potential to improve prescribing-related outcomes and inequities in quality medicines use.

COMPETING INTERESTS
Nil.

AUTHOR INFORMATION
Katherine Bloomfield: Faculty of Medical and Health Sciences, The University of Auckland, Takapuna, New Zealand; Te Whatu Ora Waitematā, Auckland, New Zealand.
Joanna Hikaka: Faculty of Medical and Health Sciences, The University of Auckland, Takapuna, New Zealand.
Julia Brookes: Te Whatu Ora Waitematā, Auckland, New Zealand.
Annie Tatton: Faculty of Medical and Health Sciences, The University of Auckland, Takapuna, New Zealand.
Cheryl Calvert: Te Whatu Ora Te Toka Tumai, Auckland, New Zealand; Te Whatu Ora Counties Manukau, Auckland, New Zealand.
Zhenqiang Wu: Faculty of Medical and Health Sciences, The University of Auckland, Takapuna, New Zealand.
Michal Boyd: Faculty of Medical and Health Sciences, The University of Auckland, Takapuna, New Zealand.
Kathy Peri: Faculty of Medical and Health Sciences, The University of Auckland, Takapuna, New Zealand.
Dale Bramley: Te Whatu Ora Waitematā, Auckland, New Zealand.
Martin J Connolly: Faculty of Medical and Health Sciences, The University of Auckland, Takapuna, New Zealand; Te Whatu Ora Waitematā, Auckland, New Zealand.

CORRESPONDING AUTHOR
Katherine Bloomfield: Waitematā Clinical Campus, North Shore Hospital, PO Box 93 503, Takapuna, Auckland 0740, New Zealand.
E: katherine.bloomfield@waitematadhb.govt.nz

URL
www.nzmj.org.nz/journal/vol-137-no-1593/changing-the-script-medicine-optimisation-recommendations-made-during-proactive-multidisciplinary-meetings-with-older-adults

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Alcohol-associated liver disease and the COVID-19 pandemic in New Zealand—a single centre retrospective analysis

Kevin YY Chen, Michael TM Wang, Cameron Schauer

Alcohol-associated liver disease (ALD) is a public health problem that has been exacerbated by the COVID-19 pandemic.[1,2] Several studies have reported an increase in alcohol misuse during the COVID-19 pandemic due to lockdown restrictions, and this has resulted in a corresponding rise of alcohol-related harms, which include ALD.[3,4] Some of these may stem from reduced access to abstinence services, increased anxiety, social isolation and easier access to alcohol through e-commerce.[5,6] This trend is more pronounced in younger age groups with pre-existing alcohol use disorder and may have important public health consequences for years to come.[1,3,6]

In comparison, we demonstrated that New Zealand's public health response to COVID-19, perhaps somewhat surprisingly, did not appear to increase alcohol-related harms, as we showed alcohol-related acute hospital presentations were unchanged pre-pandemic compared to matched periods during the pandemic lockdown.[7] Given the discordance with international literature, it was suggested that admissions specifically for ALD during these periods should be examined in more detail, particularly clinical severity and adverse outcomes, to determine the influence of COVID-19 lockdown restrictions on this important subgroup.

We therefore conducted a single centre retrospective case-controlled analysis in the Waitematā district, which has a catchment of approximately 650,000 people. We reviewed all ALD cases separated into alcoholic hepatitis (AH), defined as patients admitted with hepatitis related to alcohol without previously established cirrhosis, and alcoholic cirrhosis (AC), which we defined as patients presenting with alcohol-related hepatitis with a previously established diagnosis of alcohol-related cirrhosis. Patients' presentations were initially extracted from clinical coding using ICD-10-AM, Eleventh Edition, between 1 January 2019 to 2 December 2021, with each case presentation individually reviewed by three doctors. Cases were only included if acute alcohol intake was deemed to be the primary cause of admission, based on history and laboratory values. This time period includes the year immediately preceding the commencement of the COVID-19 lockdown to serve as the control group for comparison. Data on demographic, clinical and admission variables were collected. The pre-COVID group (before 25 March 2020) was compared to the COVID-19 group, and the same comparisons were also performed for two separate sub-cohorts of AH and AC. Inter-group comparisons of normally distributed continuous variables were conducted using the independent samples *t*-test, following confirmation with Shapiro–Wilk normality testing ($p>0.05$). Non-normally distributed continuous data were compared using the Mann–Whitney U test, and categorical data analysed using the $\chi 2$ and Fisher's exact tests. Local ethics approval was granted (ID: RM15128).

A total of 68 and 92 ALD presentations pre and during COVID-19 lockdown, respectively, were analysed. There were no significant differences in demographic variables between the two groups aside from lower Māori and higher Asian patient presentations during COVID-19 lockdown within the AC sub-cohort (Table 1). Clinical severity as determined by MELD, MELD-Na or Glasgow Alcoholic Hepatitis scores were not significantly different between the two groups. Child–Pugh scores were not significantly different pre and during COVID-19 lockdown for the AC sub-cohort. Despite this, there was a significant trend of less steroid treatment during COVID-19 lockdown overall ($p=0.04$). Adverse outcomes (acute kidney injury, hepatic encephalopathy, ascites, variceal bleed, ICU admission and intubation), mortality and re-hospitalisation rates were not significantly

different between the two groups overall or in the sub-cohorts.

ALD presentations in Waitematā, New Zealand were overall not significantly influenced by the COVID-19 pandemic lockdown restrictions. The trend of less steroid treatment for ALD during COVID-19 lockdown may represent concerns around additional immunosuppression during this time. The clinical severity and adverse outcomes of ALD presentations, however, were similar pre and during COVID-19 lockdown. This stands in contrast to the rise in severe ALD cases, even requiring liver transplantation, seen in other developed countries during COVID-19 lockdowns.[8–10] An Australian study has found ALD rates significantly increased since COVID-19 lockdown, but not the clinical severity.[11] Our findings may reflect survey data on alcohol consumption, which demonstrated varying consumption levels, with 47% of respondents unchanged and 34% actually decreasing alcohol consumption during the first lockdown.[12] We hypothesise that potentially social support structures implemented by the government helped to mitigate potential harms. Longer follow-up to assess alcohol-related harms is required to assess for any longer-term impact, in particular as inflationary economic pressures of these policies are translated to higher cost of living for our population.

The strength of this study is its focussed aim and high level of detail on each clinical presentation, with individual case review. The main limitation is its retrospective design and single centre nature, and lack of quantification of excess alcohol consumed. The AH cohort of patients is heterogenous and includes a range of patients without cirrhosis, from those without liver disease to those with possible advanced fibrosis. Our results are generalisable to other large New Zealand cities but not to other countries, given New Zealand's unique characteristics, including its relative geographic remoteness and diverse ethnic composition.

In conclusion, this study is consistent with our prior results and supports that New Zealand is comparatively unaffected by the negative impact of COVID-19 lockdown on alcohol-related harms seen in other countries.

Table 1: Alcohol-associated liver disease presentation characteristics. Data are presented as mean ± SD, median (IQR) or number of patients (% of patients).

Characteristic	All			Alcoholic hepatitis			Alcoholic cirrhosis		
	Pre-COVID (68)	COVID-19 (n=92)	p	Pre-COVID (n=28)	COVID-19 (n=45)	p	Pre-COVID (n=40)	COVID-19 (n=47)	p
Age (years)	46.3±13.2	50.2±11.7	0.33	39.5±12.3	48.0±11.3	0.07	52.1±12.4	48.2±7.3	0.77
Male sex	44 (64.7%)	67 (72.8%)	0.30	19 (67.9%)	32 (71.1%)	0.80	25 (62.5%)	35 (74.5%)	0.25
Ethnicity									
European	51 (75.0%)	76 (82.6%)	0.13	16 (57.1%)	36 (80.0%)	0.25	35 (87.5%)	40 (85.1%)	0.02
Māori	6 (8.8%)	1 (1.1%)		2 (7.1%)	1 (2.2%)		4 (10.0%)	0 (0.0%)	
Pacific peoples	1 (1.5%)	1 (1.1%)		1 (3.6%)	1 (2.2%)		0 (0.0%)	0 (0.0%)	
Asian	9 (13.2%)	14 (15.2%)		8 (28.6%)	7 (15.6%)		1 (2.5%)	7 (14.9%)	
Other	1 (1.5%)	0 (0.0%)		1 (3.6%)	0 (0.0%)				
Length of admission (days)	6 (2–10)	6 (2–10)	0.93	10 (7–16)	12 (7–15)	0.82	5 (1–9)	6 (3–14)	0.88
Cost of admission (NZ$)	8,230 (3,300–13,400)	8,190 (3,400–16,820)	0.48	8,130 (3,010–22,920)	9,100 (6,800–17,110)	0.87	7,300 (2,600–12,880)	8,940 (4,630–25,990)	0.49
MELD score	16 (13–21)	17 (12–21)	0.76	15 (8–21)	17 (12–20)	0.29	17 (13–21)	18 (14–24)	0.75
MELD-Na score	18 (14–26)	20 (14–24)	0.98	18 (8–26)	20 (15–23)	0.99	18 (14–25)	21 (13–25)	0.83
GAHS score	7 (6–8)	7 (6–8)	0.97	6 (5–8)	7 (6–8)	0.51	7 (6–8)	6 (6–7)	0.56
Child–Pugh score	-	-	-	-	-	-	7 (6–8)	6 (6–9)	0.66

Table 1 (continued): Alcohol-associated liver disease presentation characteristics. Data are presented as mean ± SD, median (IQR) or number of patients (% of patients).

Charlson Comorbidity Index	1 (0–2)	1 (0–2)	0.15	1 (0–1)	1 (0–2)	0.80	1 (0–2)	1 (0–1)	0.07
Previous abstinence	37 (55.2%)	54 (58.7%)	0.75	13 (46.4%)	26 (57.8%)	0.47	19 (40.4%)	28 (59.6%)	>0.99
Hazardous drinking	59 (86.8%)	81 (88.0%)	0.81	26 (92.9%)	40 (88.9%)	0.70	33 (82.5%)	41 (87.2%)	0.56
COVID-19 infection	0 (0%)	13 (14.1%)	<0.01	0 (0%)	4 (8.9%)	0.27	0 (0%)	9 (19.1%)	0.01
Adverse outcomes									
Acute kidney injury	11 (16.4%)	26 (28.3%)	0.09	5 (17.9%)	11 (24.4%)	0.57	6 (15.0%)	15 (31.9%)	0.08
Hepatic encephalopathy	14 (20.6%)	22 (23.9%)	0.70	3 (10.7%)	6 (13.3%)	>0.99	11 (27.5%)	16 (34.0%)	0.64
Ascites	40 (58.8%)	49 (53.3%)	0.52	8 (28.6%)	16 (35.6%)	0.61	32 (80.0%)	33 (70.2%)	0.33
Variceal bleed	4 (5.9%)	7 (7.6%)	0.76	2 (7.1%)	2 (4.4%)	0.64	2 (5.0%)	5 (10.6%)	0.45
Endoscopy	19 (27.9%)	29 (31.5%)	0.73	5 (17.9%)	13 (28.9%)	0.40	14 (35.0%)	16 (34.0%)	0.93
Steroid treatment	7 (10.3%)	2 (2.2%)	0.04	7 (25.0%)	0 (0.0%)	<0.001*	0 (0.0%)	2 (4.3%)	0.50
Intensive care unit admission	1 (1.5%)	4 (4.3%)	0.40	1 (3.6%)	2 (4.4%)	>0.99	0 (0.0%)	2 (4.3%)	0.50
Intubation	1 (1.5%)	2 (2.2%)	>0.99	1 (3.6%)	1 (2.2%)	>0.99	0 (0.0%)	1 (2.1%)	>0.99
Continuous veno-venous haemodialysis	0 (0.0%)	0 (0.0%)	>0.99	0 (0.0%)	0 (0.0%)	>0.99	0 (0.0%)	0 (0.0%)	>0.99
Mortality									
Inpatient mortality	5 (7.4%)	7 (7.6%)	>0.99	0 (0.0%)	3 (6.7%)	0.28	4 (10.0%)	3 (6.4%)	0.70

Table 1 (continued): Alcohol-associated liver disease presentation characteristics. Data are presented as mean ± SD, median (IQR) or number of patients (% of patients).

30-day mortality	5 (7.4%)	7 (7.6%)	>0.99	0 (0.0%)	3 (6.7%)	0.28	5 (12.5%)	4 (8.5%)	0.73
1-year mortality	14 (20.5%)	19 (20.7%)	>0.99	4 (14.3%)	4 (8.9%)	0.47	10 (25.0%)	15 (31.9%)	0.64
Re-hospitalisation									
30-day re-hospitalisation	24 (37.5%)	32 (37.2%)	>0.99	8 (28.6%)	11 (24.4%)	0.79	16 (40.0%)	21 (44.7%)	0.67
90-day re-hospitalisation	33 (51.6%)	46 (53.5%)	0.87	11 (39.3%)	17 (37.8%)	>0.99	22 (55.0%)	29 (61.7%)	0.66

COMPETING INTERESTS
None.

AUTHOR INFORMATION
Dr Kevin YY Chen: Gastroenterology Registrar, Department of Gastroenterology, North Shore Hospital, Te Whatu Ora – Waitematā, Auckland, New Zealand.
Dr Michael TM Wang: Ophthalmology Registrar, Honorary Lecturer, Department of Medicine, The University of Auckland, New Zealand.
Dr Cameron Schauer: Consultant Gastroenterologist, Department of Gastroenterology, North Shore Hospital, Te Whatu Ora – Waitematā, Auckland, New Zealand; Senior Lecturer, Department of Medicine, The University of Auckland, New Zealand.

CORRESPONDING AUTHOR
Dr Kevin YY Chen: Gastroenterology Registrar, Department of Gastroenterology, Wellington Regional Hospital, Te Whatu Ora Capital, Coast and Hutt Valley, Wellington, New Zealand. E: kevin.chen@ccdhb.org.nz

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The Serum Treatment of Pneumonia.

April, 1924

By C.S. Williams, M.B., CH.B.

An analysis of 228 consecutive cases of pneumonia treated at the Dunedin Hospital, 1922–23, excluding cases classified as "epidemic influenzal pneumonia." We are indebted to members of the honorary staff for permission to use cases, and to the resident staff for assistance in collecting data.

The following paper was prepared with a view to ascertaining the value to the general practitioner of serum in the treatment of pneumonia:—

The question under discussion, then, is this:—Is the routine use of standard sera justified in the treatment of pneumonia by the general practitioner? Is it worth while?

In this paper technical details of bacteriology will be omitted. The subject will be dealt with from a clinical standpoint. The general practitioner has not the immediate advantage of an up-to-date laboratory, nor has he the time for the specialised work entailed in isolating causative organisms. Special apparatus, skill, and, most important of all, time, are necessary to "type" infections. Meantime the pathological process grows apace.

Our subject will be dealt with under the following headings:—(1) The theory of serum treatment in brief. (2) Technical details of the administration of serum. (3) Immediate complications following the injection of serum. (4) Sequelæ of serum treatment. (5) Statistics. (6) General discussion on cases—(a) The mortality; (b) the development of empyema; (c) general improvement after serum; (d) focal changes in the lung after serum; (e) the production of an early crisis, typical charts, and indications for the repetition of serum; (f) indications for serum treatment. (7) Conclusion.

(1) THE THEORY OF SERUM TREATMENT IN BRIEF.—The idea underlying treatment with serum is contained in the following words:—In order to gain a passive immunity to infection while the body is collecting its forces to repel the attack of invading organisms, we inject into the patient a supply of ready-made weapons. In the first place, in order to obtain these weapons, the horse is injected with varying organisms, the pneumococci and the streptococci; and in due time the horse-serum, containing anti-bodies, reaches the general practitioner.

This serum, then, we may consider as an emergency ration to the patient attacked with pneumonia. With this supply of anti-bodies he can repel the immediate attack of invading organisms, his body in the meantime forming an active immunity to the disease.

During our investigation we shall hope to find answers to these questions: Does serum act as an emergency ration? Does it stay the onslaught of pneumococci until bodily defence is sufficient to cope with it?

(2) TECHNICAL DETAILS IN THE ADMINISTRATION OF SERUM.—(a) Sera used. (b) Dosage. (c) Methods and routes of introduction.

(a) *Sera Used.*—The Commonwealth Serum Laboratory sera were used exclusively in this series of cases: Antipneumococcal (polyvalent); antipneumoccal (monovalent, against Type 1); antistreptococcal (polyvalent). Speaking generally, antipneumococcal sera were used in lobar pneumonia, while, later in our experience, antistreptococcal serum was combined with antipneumococcal serum in cases of broncho-pneumonia, especially that following whooping-cough.

(b) *Dosage.*—This was dependent upon the route chosen and the age of the patient. The customary doses aimed at were as follows:—Intravenous—Adults, 60-120c.c.; children, 30-60c.c. Intramuscular—Children, 30-60c.c. Subcutaneous—Children, 60-90c.c. If the case showed improvement in 12 hours, and if improvement was not sustained, serum was repeated according to the indications present. These indications will be discussed later.

(c) *Methods and Routes of Introduction of Serum.*—(1) The intramuscular route and (2) the subcutaneous route (in children). (3) *Via* the superior longitudinal sinus in babies. (4) Intravenous route.

(1) The Intramuscular Route.—The site most commonly chosen is the buttock. In babies and in children where the veins are not prominent, or

where the child is fractious, this method is used. A sterile 20c.c. syringe is filled with serum, air-bubbles being excluded, and the needle plunged *boldly* into the prepared skin over the buttock. Usually the child does not mind the bold, sudden stab of a sharp needle. Most inconvenience arises when the tension in the buttock following the injection of serum becomes too high. Massage of the "serum tumour" soon disperses the liquid into intramuscular spaces. Thirty c.c. into each buttock for a child of three years is sufficient. Generally there is no local reaction. Occasionally a red flush appears over the buttock. We have observed no systemic reaction. No local abscess occurred.

(2) The Subcutaneous Route.—This method was after a time considered unsatisfactory. Sites chosen were pectoral or inguinal. As much as 30c.c. may be injected into the fold of the groin in a child of three years without severe pain, provided the thigh be flexed.

(3) Via the Superior Longitudinal Sinus (intravenous).—This method suggested itself, but we considered the danger of intra-cerebral injury too great to balance any advantage which serum might have given to the patient.

(4) The Intravenous Route.—The results of using this method justify our conclusion that it is preferable. Most of our cases were treated thus:—

(a) A preliminary injection of atropine sulphate is given hypodermically fifteen minutes before the operation. In an adult 1/100gr. is the usual dose. This injection is important.

(b) Choice of Vein, etc.—A vein in the antecubital region at the elbow is usually chosen. The forearm is then prepared with iodine and spirit, the latter an advantage in children where the veins are not prominent. A tourniquet is then placed round the arm sufficiently tight to engorge the veins below.

(c) A Local Anæsthetic is then given.—This we consider an important detail. From a humane as well as from a practical point of view local anæsthesia is an advantage. The physician should remember that a second dose of serum is not infrequent. A tiny spot of pure carbolic acid is placed on the skin half an inch lateral to the vein selected. Apothesin and adrenalin, 1 per cent., or novocain, ½ per cent., is then injected through the carbolised area intradermally. Sufficient is injected to cause a wheal the size of threepence. A larger needle may then be used.

(d) Approaching the Vein.—We are accustomed to approach the vein from its lateral aspect for two reasons. Firstly, a local anæsthetic over a vein may cause, occasionally, local spasm of the vessel. Secondly, a needle advancing on the lateral aspect of a vein may be seen to kink the vein as it strikes its lateral surface, and thus some indication of proximity of lumen of vein and needle is obtained. In children of tender years and in stout females a warm bath for a few seconds, or tapping the vein with the forefinger, may cause the vein to dilate; also it may be noted that a large vein at the elbow may be palpated even if it be not seen.

(e) The Injection of Serum.—As soon as blood appears in the syringe, sufficient is drawn off for blood culture and the tourniquet is released. The needle is then steadied with the left forefinger and thumb, while the syringe is detached with the right hand. The syringe is then filled with serum, and, air-bubbles being excluded, the syringe is connected to the needle. A little blood may mix with the serum, the mixture being slowly injected into the vein. The syringe may be refilled as required, the needle remaining in the vein. During the injection the patient may complain of pain, this pain varying in significance. Pain during the injection of serum is discussed under our next heading.