AUCKLAND CITY SYMPOSIUM

"Advances in Diabetes, Obesity and Metabolic Syndrome"

Implications for perioperative patient management

Saturday, March 29 2025

School of Medicine
The University of Auckland

Programme and Abstracts

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Welcome

Welcome to the Auckland City Symposium 2025. Our theme for ACS 2025 is "Advances in Diabetes, Obesity, and Metabolic Syndrome".
The management of these conditions has evolved rapidly with the introduction of new medical therapies, including GLP-1 agonists and SGLT-2 inhibitors. We will hear about their impact on diabetes care in the general population and perioperative space. The management of obesity is also being transformed. We will listen to updates on the medical and surgical management of the morbidly obese, and how the bariatric team works together to provide better patient outcomes. There will also be talks on OSA and CPAP, airway management in the super morbidly obese patient and the perioperative management of the surgical patient with Metaboic Associated Liver Disease.

We are honoured to feature keynote speakers **Professor David Story** (Melbourne) and **Dr Michael Margason** (Chichester) who will share their invaluable insights and knowledge. Prof Story is the current Chair of Anaesthesia at the University of Melbourne, and the current ANZCA president. He will share his expert knowledge of the perioperative management of the diabetic patient. Dr Margason has a special interest in the anaesthetic management of the morbidly obese patient. Our expert local speakers include Professor Rinki Murphy (Endocrinologist) and Mr Michael Booth (General and Bariatric surgeon) and Anaesthetists Dr Tom Fernandez, Dr Liam O'Hara and Dr Gemma Malpas.

We would like to thank our industry partners Medtronic, Fisher and Paykel Healthcare and Promed Technologies for their ongoing support of our educational activities. This enables us to offer the highest quality scientific programme possible.

And finally thank you to our delegates. We hope you all enjoy the day.

Drs Peter Xiang, Jay Van Der Westhuizen & Neil MacLennan, Co-Convenors ACS 2025

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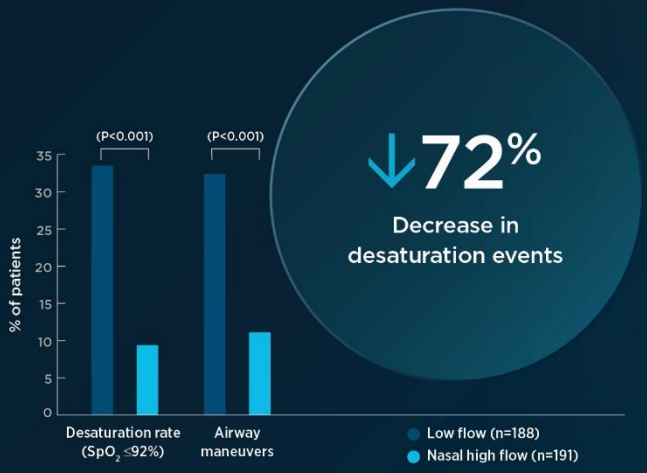
Reduce risk of desaturation[1-4]

Reduce airway interventions[1,4,5]

Improve patient safety[4]

Nasal high flow (NHF) for airway management during procedural sedation. NHF has been shown to reduce the risk of desaturation[1-4] and resulting airway interventions[1,4,5], improving patient safety[4].

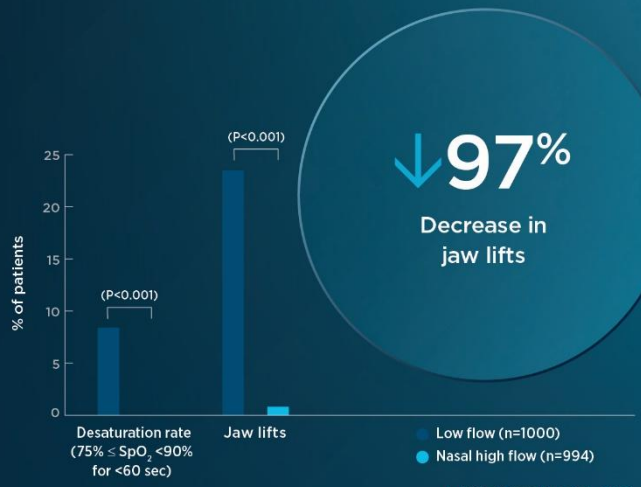
Nay et al., 2021 | High risk GI endoscopy patients[5]



↓72%
Decrease in desaturation events

Adapted from Nay et al., 2021

Lin et al., 2019 | Low risk GI endoscopy patients[1]



↓97%
Decrease in jaw lifts

Adapted from Lin et al., 2019

Positive airway pressure[6-8]

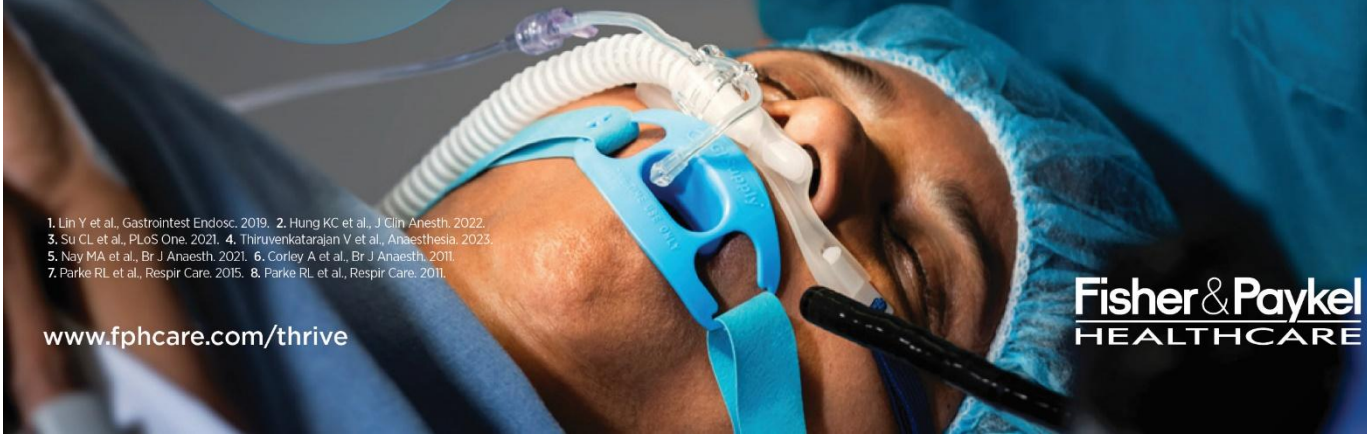
Corley et al., 2011

↑26%
Increase in end-expiratory lung volume compared to low-flow cannula[6]

Low flow | Nasal high flow

Low flow vs Nasal high flow

Adapted from Corley et al., 2011



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International Faculty

Prof David Story

Prof Story is Professor and Foundation Chair of Anaesthesia at the University of Melbourne, and Head of the University Department of Critical Care. He is the current ANZCA President. His main research interest is clinically and cost-effective approaches to reduce perioperative risk, complications, disability, and mortality. He also does translational work in acid-base disorders; environmental impact research and is a consumer investigator in diabetes care.

Dave is a staff anaesthetist at the Austin Hospital where he provides perioperative care for most procedural specialties including liver transplantation. His academic and ANZCA roles include supporting students, trainees, and fellows in pursuing research, education, and leadership. His love of the outdoors led to research in altitude physiology, subsequent anaesthesia career, environmental advocacy, and recreational hiking and bike riding.

Dr Michael Margarson

Dr Margarson trained in London, Oxford, Munich and Sydney and is currently Consultant in Anaesthesia and Critical Care, St Richard's Hospital, Chichester. He was a founder member of the UK Society for Obesity and Bariatric Anaesthesia (SOBA), is currently Vice-president for the European Society for the Peri-operative Care of the Obese Patient (ESPCOP), and active in the sub-committees of the Society for Anesthesia and Sleep Medicine.
His original research interest and MD thesis was on microvascular permeability and rates of transcapillary albumin escape in sepsis. Current interests are mainly focussed around the airway and dosing scalars in anaesthesia for the morbidly obese. He is currently on sabbatical at the Royal Hobart Hospital in Tasmania.

New Zealand Faculty

Speakers

Prof Rinki Murphy

Mr Suheelan Kulasegaran

Dr Chaey Leem

Dr Michael Booth

Dr Gemma Malpas

Dr Tom Fernandez

Dr Liam O'Hara

Programme

8:00 AM - 8:15 AM	**Registration**
8:15 AM - 8:25 AM	**Opening & Welcome**
	Session 1 - Diabetes management in 2025
8:25 AM - 8:55 AM	Drug treatment of DM and the value of preoperative HbA1c - Prof David Story
8:55 AM - 9:25 AM	Outside the perioperative space: What's new in medical therapy for Type 2 Diabetes? - Prof Rinki Murphy
9:25 AM - 9:55 AM	GLP1's and SGLT2's in perioperative DM management - Prof David Story
9:55 AM - 10:25 AM	Case discussions and questions - Panel
10:25 AM - 10:55 AM	**Morning Break**
	Session 2 - Obesity Management
10:55 AM - 11:25 AM	Current surgical management options in morbid obesity - Mr Suheelan Kulasegaran
11:25 AM - 11:55 AM	Impact of GLP-1's on Obesity management - Prof Rinki Murphy
11:55 AM - 12:25 PM	Medical management and patient support in bariatric surgery - Dr Chaey Leem
12:25 PM - 12:45 PM	Lessons from Bariatric Surgery: What have we learnt? (Longterm outcomes) - Dr Michael Booth
12:45 PM - 1:30 PM	**Lunch**
	Session 3 - Anaesthesia for the Morbidly Obese
1:30 PM - 2:00 PM	Drug dosing in Obesity - Dr Michael Margarson
2:00 PM - 2:25 PM	Airway management in obesity - Dr Gemma Malpas
2:25 PM - 2:55 PM	OSA and OHS in obesity - Dr Michael Margarson
3:00 PM - 3:30 PM	**Afternoon Break**
	Session 4 - "Diabesity" Outcomes and Cases
3:30 PM - 4:00 PM	Metabolic dysfunction associated liver disease - Dr Tom Fernandez
4:00 PM - 4:35 PM	Obesity cases with the Panel - Dr Liam O'Hara
4:35 PM - 4:55 PM	Panel Q&A - Panelists
4:55 PM - 5:00 PM	**Closing comments and future meetings**
5:00 PM - 6:00 PM	**Drinks & Canapes** Join us after the Symposium in the foyer for Drinks & Canapes

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Drug treatment of DM and the value of preoperative HbA1c

Prof. David Story

The most important perioperative diabetes drug is insulin. The fastest onset and shortest duration is IV regular insulin.

A rough, conservative, guide to inpatient insulin therapy (usually postoperative) is:
Total insulin = 0.5 units / kg / day.
Of this half is taken as basal = 0.25 units / kg / day, glargine SC
The other half is divided into three doses = 0.08 units / kg/ day X 3, aspart SC

The perioperative utility of glycosylated haemoglobin (HbA1c) is enhanced by using the newer SI units of mmol/mol rather than percentage. An HbA1C > 42 mmol/mol = diabetes diagnosis.

Three useful values are 50, 75, and 100 mmol/mol:

- No history of diabetes + HbA1c > 50 mmol/mol = likely new diabetes diagnosis
- Known diabetes + HbA1c >75 = bad control
- Known diabetes + HbA1c > 100 = terrible control

Increasing HbA1c is associated with increased postoperative complications.

The HBA1c in mmol/mol can also be used to easily calculate the average blood glucose:

- Average blood glucose eAG (mmol/L) = HbA1c (mmol/mol) / 7 + 1
- e.g. HbA1c 75 mmol/= average blood glucose of 11.7 mmol/L

No known diabetes + HbA1c < 42 mmol/L + blood glucose > 10 mmol/L
= stress hyperglycaemia

Suggest testing HbA1c for inpatients > 55 yrs

Diabetologists and Diabetes Nurses are our friends

Outside the perioperative space: What's new in medical therapy for Type 2 Diabetes?

Prof Rinki Murphy

Guideline care for type 2 diabetes (T2D) involves a new order and type of medication selection that targets multiple cardiorenal risk factors and addresses multiple treatment goals simultaneously while considering individual preferences, contraindications/side effects and cost.

SGLT2i and GLP1RA have prominent, early prescribing considerations due to their demonstrable benefits in reducing cardiovascular disease and renal risk, in addition to glucose-lowering efficacy and weight loss. SGLT2i have specific benefits for heart failure and gout. GLP1RA, and pioglitazones have benefit in MASLD or MASH.

Diabetes technology in continuous and intermittently scanned glucose monitors are helpful in self-monitoring and informing the need for tailored glucose-lowering therapies.

We will review the data on remission of type 2 diabetes using meal replacement dietary approaches and bariatric surgery with individualised treatment approaches based on shared decision-making around patient goals, preferences, safety considerations, cost and access barriers to care.

GLP1's and SGLT2's in perioperative DM management

-Diabetes drugs that give us grief

Prof David Story

Recent UK consensus statement:

El-Boghdadly K, et al. Elective peri-operative management of adults taking glucagon-like peptide-1 receptor agonists, glucose-dependent insulinotropic peptide agonists and sodium-glucose cotransporter-2 inhibitors: a multidisciplinary consensus statement, *Anaesthesia.* 2025, Apr;80(4):412-424.

Recommendations GLP1s

• The risk of pulmonary aspiration and mitigation strategies should be discussed with patients using shared decision-making
• Patients should continue to take glucagon-like peptide-1 receptor agonists throughout the perioperative period.
• Adhere to recommended fasting guidelines
• Upper gastrointestinal symptoms alone should not be used to determine gastric content
• Regional anaesthesia considered for primary anaesthetic technique

Comment: There is still a lot of uncertainty about the risks and approaches to managing patients on these drugs. The recommendation about gastric symptoms is not discussed in the text and caution is needed where there are clear GIT symptoms. Gastric ultrasound is an emerging technology. Diabetologists and obesity physicians have little understanding of pulmonary aspiration.

Recommendations SGLT2i

• Risk of peri-operative ketoacidosis and mitigation strategies should be discussed with the patient using shared decision-making
• SGLT2Is should be omitted the day before and the day of procedure.
• Patients and clinicians should adhere to fasting guidelines and avoid
prolonged starvation times
• For patients discharged from hospital on the day of surgery, SGLTIs should be restarted once eating and drinking normally (usually 24–48 h after surgery)
• Patients staying in hospital after surgery, consider re-starting SGLT2i once eating and drinking normally and capillary ketones < 0.6 mmol/L
• For DM patients on a very low energy/liver reduction diet for surgery, stop SGLT2i
at commencement of diet and adjust diabetes mellitus treatment as necessary.
• Written sick-day rules should be provided to patients at pre-operative assessment and at discharge

Comment: We will be seeing many more patients on these drugs for non-DM reasons. Although implied ketosis screening should continue into the postoperative period. This is particularly so for patients admitted for emergency surgery who will also be at greater risk for ketoacidosis due to the physiological stress of surgical emergencies. The key to treating perioperative DKA is insulin/glucose / potassium. However, in some mild cases, glucose alone may stimulate adequate endogenous insulin release.

Impact of GLP-1's on Obesity management

Prof Rinki Murphy

Glucagon-like peptide-1 receptor agonist (GLP1RA) medications have led to a shift in the obesity treatment paradigm. We will review the history of GLP1RA and their rise to becoming the leading obesity medications in use, leading to global shortages.

Liraglutide shows a mean 9% weight loss and demonstrable benefits for major adverse cardiovascular events (MACE) and reduction in nephropathy. Semaglutide shows mean 15% weight loss and demonstrable effectiveness in type 2 diabetes, heart disease, heart failure, and chronic kidney disease. Tirzepatide dual agonist (GLP1RA/GIPRA) shows a mean 20% weight loss and demonstrable effectiveness in metabolic steatohepatitis and sleep apnoea.

We will discuss practical aspects of GLP1RA medication use, what lifestyle modification is required and how they fit into modern obesity care.

The future for obesity treatment spectrum is looking bright with several dual agonists and tri-agonist combination therapies in phase 2 and phase 3 clinical trials. More advocacy is needed for better access and funding in New Zealand for highly effective obesity medications.

Current surgical management options in morbid obesity

Mr Suheelan Kulasegaran

Medical Management and Patient Support in Bariatric surgery

Dr Chaey Leem

With the advent of more effective obesity management medications, the approach to treating obesity is rapidly evolving. Obesity is a chronic, multifactorial neurohormonal disease with a significant genetic component. In New Zealand, however, managing patients with obesity remains challenging due to several factors: the obesogenic environment, limited funding and medication availability, a shortage of public bariatric surgery spaces, pervasive weight stigma, and lack of education on obesity treatment.

It is unrealistic to expect patients to achieve and sustain a healthy weight through lifestyle changes alone, as evidence shows that lifestyle interventions alone rarely lead to meaningful, long-term weight loss. For many patients, a comprehensive, evidence-based treatment plan involving pharmacotherapy and/or bariatric surgery is essential.

Our medical bariatric service at Waitemata is the sole bariatric GP-based service that provides support to the surgical team. A combination of behavioural approaches, medication optimisation, obesity pharmacotherapy, and very low-calorie diet programmes are used to achieve non-surgical weight loss for patients who are either ineligible for bariatric surgery or who require pre-operative obesity treatment.

In this presentation, we will explore a series of cases to highlight key concepts in obesity medicine. These treatment strategies can also be applied to individuals undergoing other surgical procedures.

Lessons from Bariatric Surgery: What have we learnt?

-Long term outcomes

Mr Michael Booth

Drug Dosing in Obesity

Dr Michael Margarson

Obesity affects the pharmacokinetics and pharmacodynamics of most of our drugs (1). In significant obesity it is a mistake to dose drugs using the simplest scalar of Total Body Weight (TBW). For some lipid soluble drugs this might be applicable, but for hydrophilic drugs, Vd is more closely related to Lean Body Mass (LBM) than TBW.

Drugs that are of very low lipid solubility, typical examples being non-depolarising muscle relaxants and aminoglycosides, should be dosed on a Lean body mass. Ideally this would be measured in all patients using some form of impedance plethysmography, but until we achieve this LBM can be reasonably accurately calculated using the Janmahasatian formula (2).

The use of Ideal Body Weight (IBW) as a dosing scalar has also been widely utilised and can be useful up to a BMI of around 40 for many water-soluble drugs. Yet it fails in the very large, because it is based purely on gender and height, irrespective of their total body weight. Lean Body Mass increases as total body mass increases, to represent some 6 to 9% of excess body weight (the muscular, skeletal and blood/interstitial volumes); such that In the largest patients, a calculated Ideal Body Weight may give a value that is 40% lower than that of true Lean Body Mass. Ideal Body Mass is a virtual scalar that does not represent any physiological volume or mass, and should not be used when drug dosing in the Obese

Dosing based on Lean Body Mass (LBM) is the most logical and forms the basis of the SOBA consensus on drug dosing (3). Depending on the degree of fat solubility, and whether the drug is administered as a bolus or as an infusion, an adjustment of lean body mass may be required. Adjusted body mass scalars should explicitly state the percentage adjustment and the underlying scalar, ie Adj15_LBM or Adj40_LBM

Typical Lean body masses are in the range 50-70 kg in even the most obese females – and never above 80kg. In males with obesity, typical LBM values are 70-100kg. Only the most massive and muscular of males will have a LBM much in excess of 120kg

In the field of pharmacokinetic modelling, the use of allometric scaling has gained interest. Classic TCI models have poor predictive ability when used in the obese. The performance of TCI models incorporating allometric scaling e.g. The Eleveld PK model for propofol, proved superior compared to the Schnider and Marsh model (4). However, these models are not well validated in patients with BMI >50, although recent studies are now appearing with significant numbers of High BMI subjects (5), so depth of anaesthesia monitoring is always advised when using TIVA in the Obese.

Pharmacokinetics of volatile anaesthetics are hardly affected by obesity. Use of the least fat-soluble agents, such as Desflurane (often used in conjunction with Nitrous Oxide, some 20 times less fat soluble than the volatile) is a logical choice; but if this combination is used, environmental factors mandate scrupulous low flows throughout.

However, almost all our current drug doses are derived from dose finding studies using the total

body weight of an individual with a ‘normal’ body composition of between 10 and 15% fat. Calculations of Lean Body Mass need to be adjusted upwards by that 10-15% to give a truly comparable dose. We are a long way from achieving consensus on the correct dosing scalar for many drugs and much of the older literature is not applicable to the obese.

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Airway Management in Obesity

Dr Gemma Malpas

OSA and OHS in Obesity

Dr Michael Margarson

Obstructive sleep apnoea (OSA) is collapsibility of the upper airway, and the most commonly recognised type of sleep-disordered breathing (SDB) and very common. There is a spectrum of disease within the SDB family, and of severity. Severe OSA is found in perhaps 10% of morbidly obese patients.

In OSA there is a cyclical process of occlusion of the upper airway culminating in obstruction and apnoea or else hypoventilation. This results in hypoxia and hypercarbia with a fragmented sleep pattern as the patient awakens or lightens. Untreated OSA leads to the development of cardiovascular comorbidities, in particular to pulmonary hypertension, ventricular hypertrophy and diastolic dysfunction, with a marked reduction in exercise tolerance, and of life expectancy. (1)

STOP-BANG remains the most widely used screening-tool as it is simple and easily applicable. The formal diagnosis of OSA is usually made with polysomnography (PSG), where the event rate of hypoventilation apnoea's and number and depth of desaturations are recorded while the patient sleeps. However, in the majority, a diagnosis can be made simply with an oximeter at home measuring the overnight depths and duration of Oxygen Desaturation episodes (2).

Nocturnal CPAP is the usual treatment, but around 50% of patients are poorly compliant with therapy and thus obtain little benefit. Those who are fully compliant seem to improve their ventricular function and appear relatively safe from significant respiratory depression and apnoeic events in the peri-operative period. (3)

At the severe end of the spectrum, OSA will progress with a loss of sensitivity to hypercarbia and hypoxia, and the obesity hypoventilation syndrome (OHS) will develop, a combination of obesity with daytime hypoxaemia and hypercapnia (4). These patients may be cyanotic, the "Blue bloaters" of old. The combination of chronic hypoxaemia and hypercapnia make this subgroup particularly susceptible to the respiratory depressant effects of anaesthetic agents and opioids. OHS is highly likely when OSA presents with an elevated serum bicarbonate – although beware the renal patient with a chronic metabolic acidosis in whom bicarbonate will not be elevated. The validity and safety of low-opioid or intra-operative opioid-free anaesthesia is contentious but will be briefly explored.

Identifying which subgroups of patients need post-operative high dependency unit observation and/or respiratory support in the immediate peri-operative period is difficult, and guidance is complex. A widely quoted and practical European guideline is available.(5)

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Metabolic Dysfunction Associated Liver Disease

Dr Tom Fernandez

Metabolic dysfunction-associated steatotic liver disease (MASLD), (formerly known as non-alcoholic fatty liver disease (NAFLD)), has become the leading contributor to chronic liver disease worldwide. It's increase parallels the rise of obesity, diabetes and metabolic syndrome. Despite its prevalence, MASLD is often overlooked in perioperative risk assessment, increasing the likelihood of unrecognized cirrhosis and postoperative complications.

This presentation explores the epidemiology, pathophysiology and progression of MASLD, emphasizing its association with metabolic dysfunction, it's silent nature and the importance of early detection. The role of non-invasive risk stratification tools such as the FIB-4 score in utilizing Fibroscan to identify fibrosis and cirrhosis will be discussed, including its potential utility in perioperative assessment and planning.

A structured framework for preoperative assessment and multidisciplinary team planning will be proposed including the identification of cirrhosis, portal hypertension and associated organ disease and their impact on surgical outcomes and perioperative morbidity and mortality. Importantly the presence of cirrhosis should not simply contraindicate surgery. Instead, full clinical assessment and integration of liver-specific risk assessment scores (Child-Pugh, MELD, and Vocal PENN) alongside multidisciplinary team planning and patient optimization should be utilized to ensure safer outcomes and a reduction in surgical morbidity and mortality.

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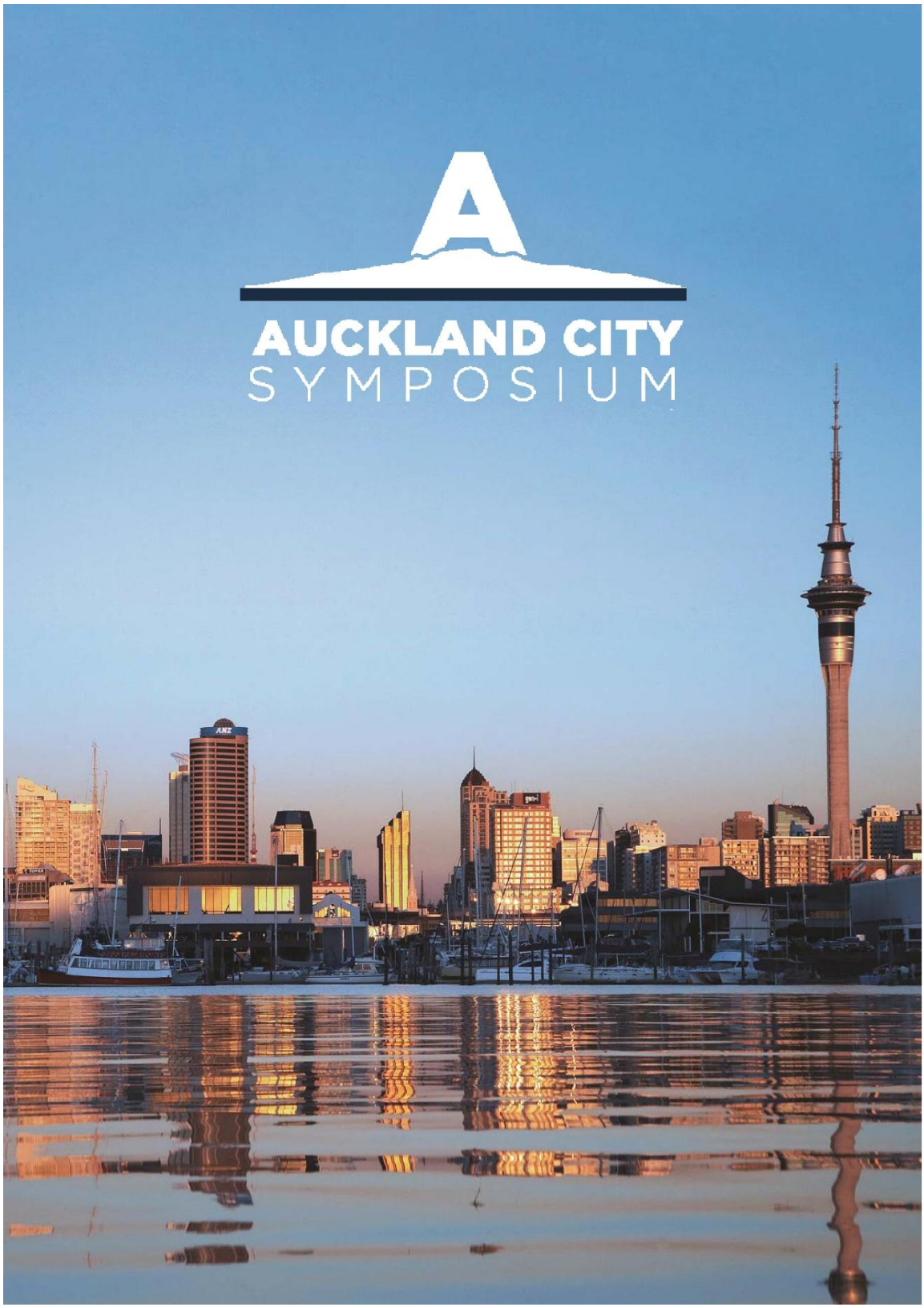
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