Gastroenterology and Hepatology From Bed to Bench.

MEETING ABSTRACTS

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"Should I tattoo that polypectomy site" - how many tattoos are too many tattoos?

Irwin J[1], Lill M[2], Lockett B[3], Young M[1]
[1]Palmerston North Hospital, Palmerston North, New Zealand, [2]Whanganui Hospital, Palmerston North, NZ, [3]MedLab Central, Palmerston North, NZ

Background: New Zealand National Guidelines (1) recommend tattooing the site of polypectomy for polyps >=15mm, aiding identification of the site (at cancer surgery, or during endoscopic surveillence) should the resected polyp harbour occult malignancy. However, many polyps >=15mm are benign, and colonic tattoos last many years. The presence of colonic tattoos may not allow accurate localisation of future pathology with additional tattoo placement. To assess the frequency of occult malignancy in resected polyps.

Methods: All Bowel Screening Programme colonoscopy performed in Whanganui and the Manawatū (01/12/2019 - 01/04/2022) was analyzed: size, location and malignancy status of resected polyps was recorded. Biopsies recording overtly visible adenocarcinoma were recorded.

Results: 1343 colonoscopies were examined. Adenoma detection rate was 63.6%. 44 overt cancers (in 3.3% of colonoscopies), 347 polyps >=15mm (in 20% of colonoscopies), and 19 cancers only identified on histology of a resected polyp (malignant polyps, in 1.4% of colonoscopies) were identified.

Table 1. Malignant Polyp Rate by Size.

Size	No Cancer	Cancer	Proportion
<10mm	3420	2	0.001
10-14mm	283	3	0.010
15-19mm	156	3	0.019
20-24mm	89	5	0.053
>=25mm	88	6	0.064

Table 2. Malignant Polyp Rate in Polyps >=15mm.

Location	No Cancer	Cancer	Proportion
Rectum	52	3	0.055
Sigmoid Colon	155	11	0.066
Descending Colon to Caecum	126	0	0.000

Conclusion: In this cohort cancer was more common in polyps >15mm in the left colon. National Guidelines should consider recommending limiting tattoo placement to resected polyps >=15mm in the left colon, and not tattooing more proximal resected polyps unless localisation is required to assess a piecemeal resection, or there are features of cancer.

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"It's a helluva journey": a qualitative study of patient and clinician experiences of nausea and vomiting syndromes and functional dyspepsia

Sebaratnam G[1], Law M[1], Broadbent E[2], Gharibans A[1,2], Andrews C[1,3], Daker C[4], O'Grady G[1,2], Calder S[1,2], Keane C[1,2,5]
[1]Alimetry Ltd, Auckland, New Zealand, [2]The University of Auckland, Auckland, New Zealand, [3]Division of Gastroenterology, Cumming School of Medicine, University of Calgary, Calgary, New Zealand, [4]Department of Gastroenterology, Waitematā District Health Board, Auckland, New Zealand, [5]Department of Surgery, Northland District Health Board, Whangārei, New Zealand.

Background: Functional gastroduodenal disorders, such as chronic nausea and vomiting syndrome, and functional dyspepsia, are challenging to diagnose and manage clinically. The diagnostic and treatment pathways for these disorders are complex and overlap substantially; however, experiences of this pathway have not been thoroughly investigated. This study therefore aimed to explore clinician and patient perspectives on the current clinical pathway.

Methods: Semi-structured interviews were conducted between June 2020 and June 2022 with 11 patients with chronic nausea and vomiting syndrome alone or with functional dyspepsia (based on Rome IV criteria) and nine gastroenterologists who treat these conditions. Interviews were recorded, transcribed, and thematically analysed using an iterative, inductive approach. Ethics approval was granted by the Auckland Health Research Ethics Committee (AH1352).

Results: Five key patient themes were identified: (1) the impacts of their chronic gastroduodenal symptoms, (2) the complexity of the clinical journey, (3) their interactions with healthcare providers, (4) the need for advocacy, and (5) their experience of treatments. Five key clinician themes were also identified: (1) these conditions were seen as clinically complex, (2) there is an uncertain and variable clinical pathway, (3) the nuance of investigations, (4) these conditions were difficult to therapeutically manage, and (5) there are barriers to developing a therapeutic relationship.

Conclusion: Findings indicate that both patients and clinicians are dissatisfied with the current diagnostic and treatment pathways for nausea and vomiting syndromes and functional dyspepsia. Recommendations included the development of more clinically relevant and discriminant tests, standardization of the diagnostic journey, and the adoption of a multidisciplinary approach to diagnosis and treatment.

10,000 steps a day - easy, said the endoscopy nurse

Vital M, Pil R
Middlemore, Auckland, New Zealand.

Background: With the development and popularity of fitness tracking devices e.g smartphones, smartwatches, and activity tracking apps, there has been a heightened interest in monitoring the steps taken over the course of one day. Ten thousand steps are often a target for health and daily physical activity. Gastroenterology Endoscopy Nurses are on their feet all day and would do many steps toward the 10,000 steps goal of performing tasks. These tasks include taking the patient from the waiting room to the procedure room, taking care of the patients in the theatre, assisting the doctor, escorting

patients post procedure to the recovery, and restocking the theatre.
Method: Using smartphones and smartwatches, we recorded the number of steps Endoscopy Nurses took between the Middlemore Endoscopy Unit and Manukau Surgery Centre. Four Nurses who rotated working on both sites recorded their steps on a 10-hour shift from 0730 to 1800 hrs in 8 days between 18th July to 29th July 2022. Nurses' number of steps was collected and recorded at the end of each shift.
Result: The total number of steps on average taken by the Endoscopy nurses in Middlemore hospital Nurse A had an average step of 10,739 steps, Nurse B, 12,012 steps, Nurse C. 10,647 steps and Nurse D. 9,874 steps. In comparison, the Manukau Surgery Centre Nurse A. 12,947 steps, Nurse B 8,974 steps, Nurse C 11,285 steps, and Nurse D. 11,029 steps.
Conclusion: Gastroenterology Endoscopy Nurses for both Manukau Surgery Centre and Middlemore Hospital easily took 10,000 steps each day on average at work. So be fit, work as an endoscopy nurse, and no need to go to the gym!

A brief description of chronic abdominal wall pain

Showell E[1], **Lee H[2],** Anderson A[3], Ding S[3]
[1]Wellington Hospital, Wellington, New Zealand, [2]Middlemore Hospital, Auckland, New Zealand, [3]Christchurch Hospital, Canterbury , New Zealand.
Background: Chronic abdominal wall pain [CAWP] is under-recognised in patients who present with chronic abdominal discomfort1. There is currently no data on CAWP in New Zealand. We briefly describe the characteristics of CAWP in a series of patients who presented to an outpatient gastroenterology clinic in Christchurch.
Methods: Electronic records of one gastroenterologist's outpatient clinics were reviewed between March 2020 to August 2021 to identify CAWP cases. Records were interrogated for: age, gender, duration of symptoms prior to diagnosis, number of trigger points, and concurrent diagnoses. A descriptive statistical analysis was then performed.
Results: 41 cases of CAWP were identified. The average age was 44, with an age distribution from 13 to 80. 85% (35/41) were female. 21 patients had 1 trigger point positive; 16 had 2 trigger points; 3 had 3 trigger points; and 1 had no trigger points. Mean duration of symptoms prior to a diagnosis of CAWP was 28 months, with symptoms occurring from 6 months to 240 months prior to diagnosis 12 (34%) of the female cohort had a concurrent diagnosis of endometriosis. Of the total cohort, 16 (39%) had a concurrent diagnosis of gastro-oesophageal reflux disease [GORD] while 14 (34%) also had a diagnosis of sphincter of oddi dysfunction [SOD]. The prevalence of these concurrent conditions appear more frequent than in the general population for endometriosis (34% vs 6-10%), GORD (39% vs 18-28%) and SOD (34% vs 1.5%)2,3,4.
Conclusion: This audit shows an over-representation of females presenting with CAWP. The prolonged period of symptoms prior to diagnosis raises concerns that this condition is under-recognised. The higher prevalence of endometriosis, GORD, and SOD in CAWP patients may indicate an underlying association between these conditions. Further research should evaluate whether there is an association between these conditions and CAWP.
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A clinical audit of endoscopic decompression of sigmoid volvulus at a New Zealand tertiary centre over three years

Aspoas J, Robinson E, Melton A
Middlemore Hospital, Otahuhu , New Zealand.
Background: Sigmoid volvulus occurs when the sigmoid colon twists on its own mesentery. In the United States, it is the third most common cause of colonic obstruction after cancer and diverticulitis. If untreated, it can lead to bowel ischaemia, perforation, sepsis and death. The aetiology is not entirely understood; however, predisposing factors include male sex, bedridden status, chronic constipation and neurological disease. Management is centred on relief of obstruction, prevention of ischaemia and recurrence. Relief of obstruction is often achieved endoscopically with decompression, detorsion and reduction. Non-operative management is associated with a high recurrence rate.
Methods: We conducted a retrospective review of all cases that underwent endoscopic sigmoid decompression from July 2019 to July 2022 using Provation. Demographic data, co-morbidities, electrolyte disturbance, radiological imaging, endoscopic treatment and outcomes were reviewed.
Results: Over the 3 years, endoscopic decompression was performed 85 times on a total of 45 different patients. The majority of cases were male (71%), elderly with an average age of 67, had a history of chronic constipation or immobility or had electrolyte disturbance. 53% of these cases had sigmoid volvulus at the time of endoscopy. 67% of the cases performed were on patients who required at least 2 decompressions.
Conclusion: Endoscopic decompression is used to acutely treat sigmoid volvulus. It is diagnostic in the cases of colonic pseudo-obstruction, with just under half of the presentations (47%) found to have pseudo-obstruction or an alternative cause for symptoms at endoscopy. Over a third of patients (38%) had a recurrence of symptoms prompting repeat endoscopy, with 1 patient requiring 12 decompressions during the period reviewed. For these patients, their co-morbidities often limited surgical management.

A novel body-surface gastric mapping device to assess gastric function: first results in classifying abnormal clinical phenotypes

Foong D[1], Wang W[1,2,3], **Calder S5,6,** Woodhead J[6], Schamberg G[6], Sebaratnam G[6], Varghese C[6], Wu B[6], Andrews C[7], Gharibans A[5,6], Fernandes V[8], Ho V[1,2], O'Grady G[4,5,6]

[1]School of Medicine, Western Sydney University, Campbelltown, Australia, [2]Gastrointestinal Motility Disorders Unit, Western Sydney University and Department of Gastroenterology and Hepatology, Campbelltown Hospital, Campbelltown, Australia, [3]Department of Gastroenterology and Hepatology, Townsville University Hospital, Townsville, Australia, [4]Department of Surgery, Auckland City Hospital, Auckland, New Zealand, [5]Auckland Bioengineering Institute, University of Auckland, Auckland, New Zealand, [6]Alimetry Ltd, Auckland, New Zealand, [7]Division of Gastroenterology, Cumming School of Medicine, University of Calgary, Calgary, Canada, [8]Campbelltown and Camden Nuclear Medicine, Camden, Australia.

Background: Gastric emptying scintigraphy (GES) is the current gold standard for assessing gastric function. We are introducing Body-Surface Gastric Mapping (BSGM; high-resolution electrogastrography) as a novel non-invasive diagnostic strategy to measure underlying electrical slow-wave activity, hypothesising that it may increase the yield of detecting gastric motility disorders.

Methods: Ethics approval was obtained through Western Sydney University/University of Auckland. The BSGM system employed a stretchable electrode array, a wearable reader device for measuring gastric electrophysiology and an App (iPad Mini) for real-time symptom logging. Recordings were performed (30 minutes fasted, 4 hours post-meal) with a simultaneous solid-meal GES (99mTC-labelled egg sandwich, 255-325 kcal) in patients with upper gastrointestinal symptoms. Analysis encompassed spectral/spatial electrophysiology features ('Rhythm Stability Index', frequency, amplitude, and gastric slow-wave directions) and compared to a reference range. Delayed and rapid GE were defined as >10% retention (4 hours) and <30% retention (1 hour), respectively. Data is presented as mean±standard error of the mean.

Results: Of 53 patients, 41 were female; mean age 43.8±2.3 years; mean BMI 26.0±0.8. GE was abnormal in 13 (25%; 11 delayed, 2 rapid), whereas BSGM was abnormal in 22 (42%) patients. BSGM disorders were classified into the following patient-specific phenotypes: neuromuscular disorder (Rhythm Stability Index < 0.25; n=12, 23%), abnormal frequency (n=2, 4%) and retrograde propagation syndrome (retrograde slow-waves ≥ 25%; n=8, 15%). Of the 31 (58%) patients with normal BSGM, 5 had delayed GE (9%; presumed gastric outlet resistance) and 26 (49%) showed four distinct symptom patterns related to meal response.

Conclusion: First results show that BSGM may increase the detection of gastric dysfunction when added to a diagnostic pathway compared to GES testing alone. This requires further investigation and validation for their clinical utility.

A rare disorder of post-partum eosinophilic enteritis: a case report

Garg P, Fox T, Smith L

Department of Gastroenterology, Auckland City Hospital, Auckland, New Zealand.

Background: Eosinophilic gastrointestinal disorders are not very common; and post-partum enteritis with eosinophilic ascites is a very rare disorder, with less than 10 cases reported in literature so far. It is characterised by eosinophilic infiltration of any part of the gastrointestinal tract and clinical manifestations are related to involvement of different layers of bowel wall. Diagnosis is made after other causes of hyper-eosinophilic syndrome have been excluded (for example allergy, parasitic infection, neoplasm or connective tissue disease). Our knowledge of this disorder is limited to case reports and management is based upon clinical experience.

Case presentation: An otherwise fit & well 30 years old lady presented 8 weeks post-partum with post-prandial abdominal pain, bloating, nausea and reduced appetite. CT showed diffuse small bowel thickening and large volume ascites. Gastroscopy showed erythematous duodenitis, duodenal and lower oesophageal biopsies showed increased number of eosinophils. Full blood count and diagnostic paracentesis revealed significant eosinophilia, ascites fluid had 90% eosinophils and peripheral eosinophil count was 7.2.

Following review by multiple specialty teams, including gastroenterology, infectious diseases, cardiology, immunology and haematology she proceeded to multiple investigations including bone marrow biopsy. A diagnosis of post-partum eosinophilic enteritis was made after ruling out infectious, allergic, malignant and connective tissue disorders. She was discharged with tapering course of prednisone with follow up in gastroenterology outpatient clinic.

Discussion: Pregnancy is an uncommon trigger for eosinophilic enteritis with only case reports in the literature, including one case where a woman had recurrent presentation after 2 different labours 8 years apart. One case reported eosinophilic gastroenteritis and ascites in first trimester of pregnancy. It is vital to rule out other causes of hyper-eosinophilic syndrome as the treatment options vary dependent on cause.

A report of mortality and morbity conferences within the gastrointestinal department at Waitemata District Health Board

Borromeo G, Raos Z

WDHB, Auckland, New Zealand.

Background: Mortality and Morbidity (M&M) Meetings are a critical component in improving quality of care and education of clinical staff (1). This is a retrospective collection of cases of the Waitemata District Health Board (WDHB).

Method: Each case was entered into a confidential database including demographics, underlying diagnosis, type of error etc. The cases were collated by a gastroenterologist and a gastroenterology nurse for consensus plus recommendation for quality improvement.

Results: There are 57 cases reviewed with a mean age of 63. There were 9 deaths, 24 contributed harm, and 13 near misses. The most common diagnosis was upper GI bleed, followed by PEG related cases. The cause for the harm was commonly identified as under recognition of a patient's condition. 10 cases were identified as poor coordination, and 25 cases involved primarily gastroenterology, with other departments (General Medicine, Emergency department etc.) at 32. 18 times the Team agreed that the best way to solve potential issues was to improve care pathways 10 times it was to improve communication. Outcomes recommended in the group, included development of a gastroenterology inpatient service, an ERCP stent database, the remainder include better written and clinical communication and information sharing. 11 recommendations were completed. 20 were partially completed; 6 recommendations have not been completed.
Conclusion: This audit provided a snapshot of the WDHB Gastro service. Progress includes development of a gastroenterology inpatient service, which was commenced in the year 2020, as well as a stent database that was started in 2021 – both of these were supported by recommendations from the MnM Meeting. Further data is needed to complete this audit up until the present day.
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A review of the epidemiology of inflammatory bowel disease in oceania

Forbes A[1], Day A[1,2], Frampton C[1], Gearry R[1,2]
[1]University of Otago, Christchurch, New Zealand, [2]Te Whatu Ora - Health New Zealand.
Background: The incidence and prevalence of inflammatory bowel disease (IBD) can highlight changing trends and give clues to disease aetiology. Several epidemiological studies have shown high rates of IBD across Australasia. We sought to summarise these by conducting a systematic review of the incidence and prevalence of IBD in Oceania.
Methods: Medline, Embase, CINHAL and Scopus databases were searched from inception to 23 July 2022 for studies reporting the incidence or prevalence rates of IBD, Crohn's disease (CD) or ulcerative colitis (UC), in Oceania. Both population-based and hospital-based studies were accepted.
Results: Twenty-six articles reporting on twenty-two incidence and eleven prevalence studies were included in the review. Two studies were from the Pacific Islands while the majority were from Australia and New Zealand. Pooled estimates showed high incidence rates of IBD 20.8 (17.1-24.6 95% CI), CD 9.2 (7.8-10.6 95% CI) and UC 7.7 (6.2-9.3 95% CI) per 100,000-person years. CD was more common than UC in most studies and recent studies tended to report higher incidence rates compared to earlier research. The prevalence studies produced pooled estimates for IBD of 303.3 (128.1-478.4 95% CI), CD 149.3 (69.1-229.6 95% CI), UC 142.7 (63.4-221.9 95% CI) per 100,000 persons.
Conclusion: We observed high rates of IBD in Oceania. The studies included in the review were heterogenous and there were several geographic gaps where there was no information available. Ethnic groups may have differences in genetics and environmental exposures but we only found limited information on indigenous Australians, Māori and Pacific Island New Zealanders with IBD.

A single centre retrospective review of endoscopic therapy for Barretts oesophagus with dysplasia.

Robinson E1, Ogra R1
Middlemore Hospital, CMDHB, Auckland, New Zealand.
Background: Barretts oesophagus occurs when intestinal metaplasia replaces the normal stratified squamous epithelium that usually lines the distal oesophagus. This occurs due to gastroesophageal reflux and carries an increased risk of adenocarcinoma.
Endoscopic therapies have been adapted to treat Barretts dysplasia and early cancer to help prevent progressive disease.
Methods: We conducted a retrospective review of all individuals who received endoscopic therapy for dysplastic Barretts oesophagus between February 2009 and July 2022. Dysplasia was reported as indefinite for dysplasia (ID), low grade dysplasia (LGD), high grade dysplasia (HGD), intramucosal adenocarcinoma (IMA) or adenocarcinoma(AC). Demographic data including risk factors, indication, mode of treatment, complications and survival post intervention were analysed.
Results: 67 individuals underwent endoscopic therapy for dysplastic Barretts over the time period. The average age at first intervention was 67 (range 43-84). The cohort were predominantly male (91%), with a smoking history (52%) and a hiatal hernia (81%). Mean BMI was 29. 174 therapeutic endoscopies were carried out. Median number of therapeutic procedures per individual was 2 (range 1-10). Average follow up was 5.15 years (range 6 days to 12.6 years). The majority had intervention for HGD 52% (35), followed by LGD 24% (16), IMA + AC 19% (13) and ID 4%(3). Therapeutic procedures were performed comprising: 47%(82) endoscopic mucosal resection (EMR), 45%(78) radiofrequency ablation (RFA), (9%)15 argon plasma coagulation (APC) and 2% (4) endoscopic submucosal dissection (ESD).
The complication rate was 5% (9/174) with 2 perforations, 2 post EMR bleeds and 5 benign strictures requiring dilatation.
Conclusion: Multimodal treatment for Barretts dysplasia is effective and safe in the hands of experienced endoscopists. In our cohort it was also used as an adjunct in patients with adenocarcinoma, not fit for surgical resection.

Acceptability of telehealth in hepatology - a model for future healthcare provision

Hakak F[1], Patel R[2], Gearry R[3,4]

[1]6th Year Medical Student, University of Auckland, [2]Consultant Gastroenterologist and Endoscopist, Rotorua Hospital, [3]Academic Head, Department of Medicine, University of Otago, [4]Consultant Gastroenterologist, Christchurch Hospital.

Background: COVID-19 has put significant pressure on the way healthcare is delivered. To combat the surge in cases and reduce face-to-face contact, we have seen significant growth in telemedicine services worldwide. We evaluated patient acceptability of telemedicine in hepatology services with a view to understanding its long-term sustainability.

Methods: An OVID MEDLINE literature search was conducted by using the following MeSH terms: hepatology, liver, telemedicine, videoconferencing, remote consultation.

Results: 21 papers were identified with the above MeSH terms. 11 papers were published after COVID-19 was declared a pandemic. 4 papers focussed on patient acceptability and are summarised below.

Hepatology Paper (Authors, Country, Publication date)	Results
Verma et al Bangalore, India January 2022	1- 99% of patients reported teleconsultation was convenient. • 83.8% prefer teleconsultations during the pandemic. • 63.3% would prefer face-to-face appointments after the pandemic.
Kim et al San Francisco, USA May 2022	• 77% of Fatty Liver Disease patients were 'satisfied' or 'somewhat satisfied' with their telehealth consult.
Hartl et al Vienna, Austria October 2021	• 55.1% of patients would prefer to continue telemedicine in the future.
Serper et al Philadelphia, USA August 2020	• Mean Net Promoter Score (NPS) 92. • NPS is a determinant of patient satisfaction. • NPS above 70 demonstrates a very positive patient experience.

Conclusion: The number of studies assessing telehealth in hepatology has approximately doubled since the pandemic started. Liver patients across a variety of healthcare settings have demonstrated generalised acceptability of receiving care through telehealth modalities. 13.9% and 7.1% of New Zealand's population are without access to the internet and telephones respectively. Telehealth services can be implemented effectively across gastroenterology subspecialties in New Zealand. However, a focus on technologically disconnected populations is required to avoid widening health disparities.

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Accuracy of non-invasive liver fibrosis scores in non-alcoholic fatty liver disease stratified by ethnicity – a New Zealand perspective

Brownson A[1], **Swaminathan A[1,2]**, Gane E[1,3], Orr D[1]

[1]New Zealand Liver Transplant Unit, Auckland City Hospital, Auckland, New Zealand, [2]University of Otago, Christchurch, New Zealand, [3]University of Auckland, Auckland, New Zealand.

Background: Non-invasive assessment of liver fibrosis in non-alcoholic fatty liver disease (NAFLD) has predominately focussed on European populations. This study assessed the performance of non-invasive tests (NIT) in predicting advanced NAFLD fibrosis stratified by ethnicity.

Methods: Patients with NAFLD followed at a tertiary referral centre between 2002-2021 were included. Ethnicity was recorded at baseline; Polynesian patients included Māori and Pacific peoples. Patient characteristics were compared using the Mann-Whitney U for continuous variables and Fisher's exact for categorical variables, with Europeans as the reference. Evaluated NITs were the NAFLD-fibrosis score (NFS), Fibrosis-4 Index (FIB-4) and vibration-controlled transient elastography (VCTE). Receiver operating characteristics (ROC) analysis assessed the performance of baseline NIT in predicting histologically confirmed advanced liver fibrosis (METAVIR ≥F3). Accurate classification of advanced fibrosis based on commonly used NFS (-1.455) and FIB-4 (1.3) thresholds was assessed with logistic regression.

Results: In total, 201 (37.4%) European, 28 (5.2%) Māori, 126 (23.4%) Pacific and 183 (34.0%) Asian patients were included. Median time from baseline assessment to biopsy (n=223) was 4 months (IQR 0-13). Polynesian patients had higher rates of obesity (89.6% vs. 77.6%, $p<0.01$) and diabetes (69.5% vs. 56.2%, $p=0.01$), but lower rates of histologically advanced fibrosis (8.5% vs. 27.3%, $p<0.01$), compared with Europeans. The area under the ROC (AUROC) for NFS (AUROCPolynesian=0.69 vs. AUROCEuropean=0.78, pdifference>0.05), FIB-4 (AUROCPolynesian=0.72 vs. AUROCEuropean=0.75, pdifference>0.05) and VCTE (AUROCPolynesian=0.70 vs. AUROCEuropean=0.78, pdifference>0.05) were similar between Polynesians and Europeans (AUCdifference $p>0.05$). An NFS threshold of -1.455 was less accurate at excluding advanced fibrosis in Polynesians compared with Europeans (OR=0.39, 95% CI 0.18-0.80). This trend was not observed with a FIB-4 1.3 threshold (OR=1.17, 95% CI 0.57-2.41).

Conclusion: Māori patients with NAFLD are underrepresented in this study population. Non-invasive tests for liver fibrosis performed similarly between Polynesian and Europeans, however, optimal thresholds for categorizing advanced fibrosis may differ by ethnicity.

Adherence to national polyp surveillance guidelines by Hutt hospital endoscopists

Wynne A, Inns S
Te Whatu Ora - Wellington And Hutt, Wellington, New Zealand.

Background: This audit of the adherence to national polyp surveillance guidelines by Hutt Hospital endoscopists was performed to evaluate current practice and to consider if an intervention is required to improve adherence.

Method: 197 serial endoscopies with polypectomy were retrospectively evaluated using the Provation report and subsequent histology. We also collected demographic and ethnicity data. Local ethics approval was granted.

Results: Amongst ten endoscopists, the median adherence to guidelines was 75% of cases (range 47% to 91%). Adherence rates were similar between gastroenterologists (median 72%, range 47% to 82%) and general surgeons (68%, range 67% to 90%). The highest rate was achieved by the nurse endoscopist (91%). We found that endoscopists are more likely to plan for additional future endoscopy than is recommended. There were 23 future planned endoscopies where, according to guidelines, patients should actually have been discharged. Additionally, there were 23 endoscopies that were planned earlier than guideline recommendation. In three cases, patients were discharged when not recommended by guidelines, and one endoscopy was planned later than guideline recommendation. The most common error was not downgrading endoscopy plans once histology results were back, particularly with hyperplastic polyps.

Conclusion: Our audit showed that in current practice by Hutt Hospital endoscopists, guidelines are not followed in one quarter of polypectomy patients. Current practice may contribute to potential harm to patients from unnecessary procedures and inappropriate utilisation of limited resources. We are now looking at possible interventions to improve practice, including the trial and audit of a nurse-led approach to post-polypectomy recall.

Advanced endoscopic ultrasound-guided biliary drainage: 10 year experience in tertiary referral centre

Weilert F, Chin J
Te Whatu Ora Waikato, Hamilton, New Zealand.

Background: EUS-guided biliary drainage became feasible with the introduction of therapeutic echoendoscopes, and has expanded with the introduction of lumen-apposing stents. Indications have widened from predominantly malignant obstruction to a range of benign indications. Potential drainage routes include both anterograde trans-hepatic and trans-duodenal approaches. Our study highlights technical and clinical efficacy and describes the adverse event profile associated with EUS drainage techniques.

Methods: Retrospective review of prospective collected database (Jan 2012–July 2022) of consecutive patients. Review of medical records, laboratory results and outcome data to assess demographics, technical and clinical success and documentation of adverse events (AE's). Approaches included anterograde cholangiography (EAC) via a trans-gastric intra-hepatic (hepatico-gastrostomy (HG), anterograde-transpapillary (ATP) or rendezvous (RV)) and trans-duodenal extra-hepatic interventions (choledocho-duodenostomy (CDD) or cholecysto-duodenostomy (GB drainage)). Trans-hepatic interventions used fully covered tubular biliary stents while trans-duodenal interventions utilised the cautery enabled lumen-apposing metal stents (CE-LAMS).

Results: One-hundred-and-forty-eight patients underwent 151 procedures (131 (86.8%) for malignant obstruction), 93 male and 55 female, aged 46 to 96 years old (average 70.9 yrs). Technical success for EAC, CDD and GB drainage was 44/48 (91.7%), 79/80 (98.7%) and 23/23 (100%), while clinical success was 44/48 (91.7%), 75/80 (93.8%) and 23/23 (100%), respectively. Adverse events occurred in EAC and CDD in 2/48 (4.2%), 19/80 (23.8%) procedures. Both EAC AE's were immediate (bleeding and bile leak) while AE's related to CDD were immediate 8/80 (10%), early 4/80 (5%) and late 7/80 (8.8%). The immediate AE's were due to stent maldeployment (with 7/7 effectively salvaged without clinical consequence), while early and late AE's were cholangitis (5) with or without stent occlusion (6).

Conclusion: EUS-guided biliary drainage is an acceptable and clinically relevant alternative to traditional surgical and percutaneous approaches with excellent technical and clinical success rates. Adverse event rates are comparable or better than other drainage routes. Stent maldeployment is endoscopically salvageable without affecting clinical outcome.

Advice regarding cervical screening is insufficient in women on thiopurine drugs for Inflammatory Bowel Disease

Anderson A[1], Barclay M[1,2], Daker C[3]
[1]CDHB, Christchurch, New Zealand, [2]University of Otago, Christchurch, New Zealand, [3]WDHB, Auckland, New Zealand.

Background: The National Cervical Screening Programme (NCSP) recommends 3-yearly cervical screening with consideration for increased rates in immunocompromised patients (1). Studies show inflammatory bowel disease (IBD) patients have high incidence of cervical dysplasia (2-4) (both independent of (5) and secondary to immunosuppression (2, 3, 6) yet low rates of screening (7, 8), so we investigated patient advice in our clinics.

Methods: This audit reviewed cervical screening advice Canterbury gastroenterologists gave IBD patients commencing azathioprine (AZA)/6-mercaptopurine (6-MP) and assessed the screening rate of this population. Eligible patients were identified using thiopurine methyltransferase

(TPMT) results from Canterbury Health Laboratories. Clinic letters were reviewed regarding screening discussion on drug commencement. The NCSP approved the study and provided cervical screening data for screening frequency. Data analysis was reported as prevalence measures, and comparisons used Chi square and Fishers Exact. Ethics approval was from University of Otago and Canterbury District Health Board.

Results: From the 171 patients identified, no clinic letters documented discussion on cervical dysplasia/cancer, although 26% had discussion regarding general malignancy risk. Cervical screening was discussed in only 8% of patient letters. Comparing advice before and after June 2019, discussion increased regarding general malignancy risk (44% vs 21%, $p<0.01$) and cervical screening (22% vs 4%, $p<0.01$), including higher prevalence of increased screening recommendation (11% vs 1%, $p<0.05$). There were no statistically significant results when comparisons were made with ethnicity, age or IBD-type. In patients who had screening analysed, 58.5% had 3-year coverage compared to the national average of 67.2%9. NCSP recommendations were met in 67% of patients who participated in screening.

Conclusion: Despite improvement since 2019, cervical screening was infrequently discussed in women with IBD as determined by clinic letters. Additionally, cervical screening rates appeared lower than the national average despite increased risk of dysplasia. This highlights the need for improved patient education to reduce harm secondary to cervical dysplasia.

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An assessment of gastric function in response to transcutaneous auricular vagus nerve stimulation: a randomised and single-blinded study in controls

Du P[1,3], Maharjan A[2], Calder S[1,3], Shultz M[2], Gharibans A1[,3], Schamberg G[3], O'Grady G[1,3], Cakmak Y[2]

[1]University of Auckland, Auckland, New Zealand, [2]University of Otago, Dunedin, New Zealand, [3]Alimetry Ltd, Auckland, New Zealand

Background: Transcutaneous auricular vagus nerve stimulation (TaVNS) is a non-invasive treatment for gastric symptoms. The advent of multi-channel body-surface gastric mapping (BSGM) has enabled reliable continuous monitoring of gastric electrophysiology for a prolonged period. The main aim of this study was to quantify the effects of TaVNS in healthy individuals in response to a 5-min water load (WL5) test.

Methods: 18 healthy volunteers of age between 21-55 years (BMI: 27.1±3.2) were recruited. Each subject fasted for up to 8 hours and participated in four sessions, which consisted of 30 min fasted baseline, 30 min TaVNS (sham, 10, 40 and 80 Hz in randomised order), WL5, and 30 min post-WL5 recordings. TaVNS was administered to the left ear using a TENS ECO-2 device. Heart rate variability (HRV) was assessed using sternal ECG and analyzed in Kubios (V3.2). BSGM and bloating (/10) were recorded using Gastric Alimetry. One-way ANOVA with post-hoc Tukey test was performed to test the difference between TaVNS protocols in terms of frequency gain, amplitude gain, bloating scores, root mean square of the successive differences (RMSSD), and stress index (SI).

Results: The subjects consumed 464±150 mL of water during WL5, with volume ingested correlated to bloating (mean score 4.1±1.8; $r=0.36$, $p=0.029$). In general, the reduction in frequency and rhythm stability during the post-WL5 period in sham was normalised by all three TaVNS protocols. Both 40 and 80 Hz protocols also caused increase in the amplitude during the stim-only and/or post-WL5 periods. RMSSD was increased during the 40 Hz protocol. SI increased during 10 Hz protocol but decreased during the 40 and 80 Hz protocols.

Conclusion: TaVNS proved effective in normalizing post-WL5 response in healthy subjects by altering both parasympathetic and sympathetic pathways. The study will inform future clinical trials of TaVNS on the management of GI symptoms in diseases.

Arabic translation study of a knowledge assessment tool for children with inflammatory bowel disease

Hurley (Vernon-Roberts) A[1], Khashana A[2], Day A[1]

[1]*University of Otago, Christchurch, New Zealand,* [2]Suez *Canal University, Egypt.*

Background: Following development and validation of a knowledge assessment tool for children with inflammatory bowel disease (IBD), the tool (IBD-KID2) was translated in to Arabic. This was to ensure the benefits of knowledge assessment are extended to other countries, as well as further establishing IBD-KID2 generalisability. The study aim was to translate and validate IBD-KID2 in to Arabic.

Methods: IBD-KID2 is a 15-item tool, scoring one point per correct answer. The Arabic IBD-KID2 was developed and validated as follows:
Content equivalence: items assessed for cultural comprehension and relevance by experts in Egypt using content validity index. Items scored on a ten-point scale with the overall proportion of maximum scores required to be above 0.78. Items scoring less required review by the Arabic/NZ team.
Semantic equivalence: IBD-KID2 translated using a 'forward-backward' process to Arabic then back to English by different translators and all items reviewed.
Technical/criterion/conceptual equivalence and generalisability: prospective study among children with IBD in Egypt allowed for score comparisons with established IBD-KID2 group scores using independent z test. Local ethics approval in Egypt was obtained.
Reliability: Test-retest completion two weeks apart, with Pearson correlation (r) coefficient used to compare scores.
Results: Twenty-five children participated: male 13 (52%), mean age 12.6 years (SD 2.4), Crohns disease 13 (52%), mean time since diagnosis 2.9 years (SD 1.5). The mean IBD-KID2 score was 8.3 (SD 1.6), equivalent to 55%. Scores were not associated with any independent variable. Test-retest completion showed strong correlation between scores (r 0.808, $p<0.001$), with no significant difference in means ($p=0.057$). Z test comparison with other paediatric IBD populations (NZ, Australia, Canada) showed no score difference ($p=0.183$, CI -0.4 to 2).
Conclusion: The translation of IBD-KID2 to Arabic used a rigorous methodology. Scores showed that the translated knowledge assessment tool has equivalence and generalizability to Arabic children with IBD.

Are intensive care unit patients with cholangitis receiving timely endoscopic retrograde cholangiopancreatography as per guideline recommended practice?

Dyavadi V[1,2], Mulvaney A[2], Bevan R[2]
[1]*New Zealand Liver Transplant Unit, Auckland, New Zealand,* [2]*Intensive Care Unit, Middlemore Hospital, Auckland, New Zealand.*

Background: Biliary drainage by urgent Endoscopic Retrograde cholangiopancreatography (ERCP) is essential in the management of acute severe cholangitis. Delayed ERCP is associated with worse outcomes. This study determined whether Intensive Care Unit (ICU) patients are receiving timely ERCP for severe cholangitis in accordance with international guideline practice.
Methods: Radiology and ICU databases at Middlemore Hospital, New Zealand were retrospectively reviewed between 2016-2021. Patients ≥18 years who were diagnosed with severe cholangitis (as per 2018 Tokyo guidelines) requiring ERCP with admission to ICU either before or after this procedure were included in this study. Primary outcome was time to ERCP from diagnosis of cholangitis. Secondary outcomes included length of ICU and total hospital stay (LOS), and procedural complications from ERCP.
Results: Severe cholangitis was identified in 20 patients. Average age was 66 years; 11 males; 10 of Pacific Island ethnicity. Average time to ERCP was 18.8 hours (SD 9.6); 30% of patients underwent ERCP ≤12 hours, 80% ≤24 hours and 100% ≤48 hours from diagnosis of cholangitis. Median ICU LOS was 34.8 hours (IQR 24-55.3); median hospital LOS was 6.8 days (IQR 4-14.8). ERCP ≤12 hours was associated with ICU LOS (30.5 vs 21.5 hours, $p=0.74$) and hospital LOS (5.5 vs 7.5 days, $p=0.54$). ERCP related complications were seen in 8 patients (deterioration of sepsis (n=6), post ERCP pancreatitis (n=2)). ERCP was performed during standard operating hours (0800-1600) in 10 patients. ERCP performed outside of standard operating hours showed a trend for higher rates of complications (RR 2.4, $p=0.17$).
Conclusion: All ICU patients with severe cholangitis received ERCP ≤48 hours from diagnosis (American Society of Gastroenterology Endoscopy guidelines). Only 30% of patients received ERCP ≤12 hours of diagnosis (European Society of Gastroenterological Endoscopy guidelines). ERCP ≤12 hours from diagnosis showed a trend for reducing total hospital LOS but not ICU LOS.

Are newer body indices (ABSI, BRI) better associated with adiposity compared to conventional measures (BMI, WC, WHR) of obesity?

Namasivayam V, Wong W, Sultana R, Lim S
Singapore General Hospital, Singapore, Singapore.

Background: Anthropometric measures such as a body shape index (ABSI) and body roundness index (BRI) has been developed to better predict the risk of obesity-related morbidity and mortality. However, there is limited data to validate their association with reference measures of body composition and adiposity. This study aims to determine whether these new indices are better associated with adiposity compared to conventional measures of obesity– body mass index (BMI), waist circumference (WC) and waist-hip ratio (WHR).
Methods: A cross-sectional study in which middle-aged subjects underwent body composition analysis by X-ray-based dual-photon absorptiometry (DXA) to determine their percent fat mass (%FM), percent android fat (%AF), and android to gynoid percent fat ratio (A/G fat ratio), which were used as reference measures to quantify adiposity. Indices-specific partial adjusted R-Squares (PAR) from generalized linear models were used to evaluate whether BRI and ABSI were better associated with adiposity than BMI, WC and WHR.

Results: Seventy patients (40 male) met eligibility criteria and provided consent. %FM was most strongly associated with BMI(PAR = 0.15; 95% CI: 0.03-0.34) followed by WHR(PAR = 0.13; 95% CI: 0.02-0.32), WC(PAR = 0.10; 95% CI: 0.00-0.28), BRI(PAR = 0.08; 95% CI: 0.00-0.26) and ABSI(PAR = 0.00; 95% CI:0.00-0.01). %AF was most strongly associated with BMI(PAR = 0.34; 95% CI: 0.20-0.54), followed by WC(PAR = 0.33; 95% CI: 0.19-0.53), WHR(PAR = 0.31; 95% CI: 0.17-0.51), BRI(PAR = 0.29; 95% CI: 0.16-0.50) and ABSI(PAR = 0.00; 95% CI: 0.00-0.11). A/G fat ratio was most strongly associated with WC(PAR= 0.18; 95% CI: 0.05-0.38), BRI (PAR = 0.15; 95% CI: 0.03-0.35), BMI(PAR = 0.10; 95% CI: 0.00-0.28), WHR(PAR = 0.08; 95% CI: 0.00-0.26) and ABSI(PAR = 0.04; 95% CI: 0.00-0.19).
Conclusion: The newer body indices (ABSI and BRI) are not superior predictors of adiposity and abdominal fat compared to BMI, WC and WHR.

Artificial intelligence (AI) to identify cases with colorectal symptoms who are at higher risk of colorectal cancer (CRC)

Sylevych V, Wang H, Falvey J
Health New Zealand - Canterbury, Christchurch, New Zealand.
Background: Triage and prioritisation of referrals for investigation of colorectal symptoms is complex and performed heuristically, including with reference to guidelines. We hypothesise that AI may aid clinical decision making. We set out to create an algorithm that predicts the risk of CRC using routine referral data.
Methods: An established database of 3202 referrals and associated outcomes (CRC=128) was used for the investigation. The dataset was refined to 66 explanatory variables including clinical, demographic and laboratory parameters. Data were reviewed for outliers, missing values and predictive power for CRC. 3 established methods appropriate to the dataset were evaluated: Random forest, Glmnet, Support Vector Machines. The dataset was split into training and validation subsets and for each method, hyperparameters were tuned using 10-fold cross-validation and receiver operator characteristics (ROC) analysis. Resulting models were evaluated using the validation dataset and compared by ROC area under curve (AUC). Thereafter, Youden's index (YI) and F1 score were used to identify the optimal probability threshold of the best model. The utility of the model was assessed by comparison with clinical triaging outcomes (urgent/not urgent). Local ethics approval obtained.
Results: The best model generated using Glmnet methodology with AUC 0.72 95% CI [0.64, 0.8]. Optimal probability thresholds were 0.35 and 0.7 by YI and F1 score respectively. Corresponding sensitivity, specificity, positive and negative predictive values at these thresholds were 0.89, 0.49, 0.07 and 0.89, and 0.18, 0.98, 0.25 and 0.18, compared with 0.66, 0.66, 0.07, and 0.98 for clinical triage to urgent investigation.
Conclusion: The algorithm derived here has definite, albeit low, predictive power for CRC risk. Further work is required to develop a clinically useful tool and to do so would require a larger, standardised, dataset.

Assessment of inflammatory bowel disease knowledge among health professionals

Blay L, Vernon-Roberts A, Day A
University of Otago, New Zealand.
Background: Inflammatory Bowel Disease (IBD) is one of the most serious chronic diseases affecting the global population, and the incidence of IBD is increasing. It is important that clinical team members who may be involved in the care of those with IBD have sufficient knowledge of their condition. To identify knowledge gaps regarding IBD among health professionals an assessment of IBD knowledge was carried out among groups of nurses, dietitians, and pharmacists.
Methods: Three recruitment methods were utilized: Nurses approached in person throughout Christchurch Hospital, dietitians via email among regional groups, and pharmacists via national newsletter advert. Participants completed surveys to measure demographics, work experience, IBD patient contact, then a 15 question IBD knowledge questionnaire (IBD-KID2) that scores one per correct answer.
Results: Participants included 200 nurses, 32 dietitians, 14 pharmacists: 93-94% of all groups were female. The mean IBDKID2 percentage score obtained by nurses was 70% (SD 14.7), pharmacists 84.4% (SD 10.8), and dietitians 88% (SD 8.6). Nurses scored lower than the other groups ($p<0.001$). Variables influencing group scores were: nurses having a first degree relative with IBD (P=0.01), pharmacists having a second degree relative with IBD (P=0.031), and dietitians with IBD specific education (P=0.013). Work experience years, routinely caring for patients with IBD, or having IBD guidelines available at work had no association with scores in any group. Two common knowledge gaps were found amongst pharmacists and nurses: whether IBD affects growth, and food triggers. Nurses had three further knowledge gaps: whether the cause of IBD is known, mechanism of biologic drugs, and inheritability of IBD.
Conclusion: Studies such as this highlight that knowledge gaps exist among health professionals that may be addressed with targeted education. By improving the knowledge of those caring for people with IBD it enhances the chance of favourable outcomes for the patients.

Assessment of medical student knowledge regarding inflammatory bowel disease

Blay L, Hurley (Vernon-Roberts) A, Day A
University of Otago, Christchurch, New Zealand.
Background: Inflammatory Bowel Disease (IBD) is regarded as being one of the most serious and important chronic diseases affecting the New Zealand paediatric population. Outcomes for children with IBD may be improved if all health professionals they encounter have sufficient knowledge of their condition. In order to provide targeted

education for medical students, an IBD knowledge assessment was undertaken.
Methods: University of Otago medical students in years 2-6 of their degree were recruited via email. Consenting participants anonymously completed a demographics and experience survey, followed by a 15 question IBD knowledge questionnaire (IBDKID2) that scores one for each correct answer (maximum 15). Data underwent statistical analysis to compare knowledge scores between years, and to identify variables associated with knowledge level.
Results: 196 medical students participated, 62% were female, 108 (55%) were in their pre-clinical years of study (years 2-3), and 99 (45%) in their clinical years (years 4-6). The average IBD-KID2 score obtained by all students was 11.6 (SD 2.2), equating to a percentage score of 77.6% (SD 14.5). Students in their clinical years of study scored higher than those in their preclinical years (P<0.001). Female medical students scored higher than their male classmates (P=0.033), and students with IBD themselves, or with a first degree relative with IBD scored higher than those without (P=0.019). Three IBD specific knowledge gaps were found amongst students: whether IBD affects growth, food symptom triggers, and nutrient absorption.
Conclusion: The specific IBD knowledge gaps amongst medical students found could be addressed with targeted education during their period of education. This would be expected to increase knowledge of IBD, although reinforcement of this knowledge should be provided periodically. By improving medical student knowledge of IBD the outcomes of patients they encounter during their training, or once qualified, may also be improved.

Australasian paediatric gastroenterologist practices of coeliac disease diagnosis before and during the COVID-19 pandemic

Ho S[1,11], Evans H[2,3], Roberts A[2,3], Thapar N[4,5,6], Dutt S[7,8], Thacker K[7], Krishnan U[9,10], Ooi C[9,10], Yap J[11,12], Sharma A[13], **Day A[1,10]**
[1]Department of Paediatrics, University of Otago Christchurch, Christchurch, New Zealand, [2]Starship Child Health, Department of Paediatric Gastroenterology and Hepatology, Auckland, New Zealand, [3]Department of Paediatrics: Child and Youth Health, University of Auckland, Auckland, New Zealand, [4]Queensland Children's Hospital, Department of Gastroenterology, Hepatology and Liver Transplantation, Brisbane, Australia, [5]School of Medicine, University of Queensland, Brisbane, Australia, [6]Woolworths Centre for Child Nutrition Research, Queensland University of Technology, Brisbane, Australia, [7]The Children's Hospital at Westmead, Department of Gastroenterology, Westmead, Australia, [8]CHW Clinical School, Children's Hospital Westmead, Faculty of Medicine and Health, The University of Sydney, Sydney, Australia, [9]Sydney Children's Hospital Randwick, Department of Paediatric Gastroenterology, Sydney, Australia, [10]School of Clinical Medicine, Randwick Clinical Campus, Discipline of Paediatrics & Child Health, University of New South Wales Medicine & Health, Sydney, Australia, [11]The Royal Children's Hospital, Department of Gastroenterology and Clinical Nutrition, Parkville, Australia, [12]Medicine, Dentistry and Health Sciences, University of Melbourne, Melbourne, Australia, [13]Joondalup health campus, SJOG Midland and Perth Paediatrics, Department of Paediatrics and Paediatric Gastroenterology, Perth, Australia.
Background: Paediatric coeliac disease (CD) can be diagnosed by the gold standard intestinal biopsy or in selective children, using coeliac serology only (non-biopsy method). This study explored the perceptions and practices of Australian and New Zealander (Australasian) paediatric gastroenterologists in diagnosing CD before and during the coronavirus (COVID)-19 pandemic.
Methods: Paediatric gastroenterologists in Australasia were invited via email to complete an anonymous online questionnaire over a two-week period in November 2021. Data were presented using descriptive statistical analysis. This study was approved by the University of Otago Ethics Committee.
Results: The questionnaire was completed by 39 consultants: 33 from Australia and six from New Zealand (NZ), equating to a 66% response rate. Thirty-four (87%) of the 39 respondents reported they currently practised non-biopsy diagnosis of CD in eligible children, while the rest diagnosed CD using biopsy confirmation only. All NZ respondents practised non-biopsy CD diagnosis. A majority of responders (76%) who practised non-biopsy CD diagnosis followed the 2020 European Society for Paediatric Gastroenterology, Hepatology and Nutrition (ESPGHAN) guideline. Twenty-two (56%) respondents reported that they started using a non-biopsy CD diagnosis protocol before the pandemic and did not change their practice during the pandemic, 10 (26%) started diagnosing non-biopsy CD during the pandemic, five (13%) stated their practices of CD were not impacted by the pandemic and two (5%) did not respond on whether the pandemic changed their practice.
Conclusion: The majority of Australasian gastroenterologist respondents reported they routinely utilised the 2020 ESPGHAN diagnostic criteria in eligible children; half of them started prior to the pandemic and another quarter started this approach due to the pandemic. A minority of practitioners routinely rely only on biopsy confirmation to diagnose CD.

Bad gas in the endoscopy suite: Climate implications of the use of nitrous oxide (N2O) during endoscopy in New Zealand

John R[1], Burrell R[2], Taylor M[2], van Rijnsoever M[3], Raos Z[3]
[1]Taranaki DHB, New Plymouth, New Zealand, [2]Counties Manukau DHB, Auckland, New Zealand, [3]Waitemata DHB, Auckland, New Zealand.
Background: There is increasing interest in using nitrous oxide (N2O) for procedural sedation during endoscopy. Proposed benefits include its efficacy, low cost, and rapidity of action/recovery. However, nitrous oxide depletes the ozone layer and is a potent and long-lived greenhouse gas with 273x the warming potential of carbon dioxide (CO2). We

investigated the use of N2O for endoscopy within NZ over the last five years and estimated its climate impact.
Methods: All endoscopy units in NZ were asked to detail their N2O use for endoscopy between 2017-2021. Emissions per procedure were estimated using reported CO2 equivalents (CO2e) for analgesic types and compared against fentanyl/midazolam as standard care.
Results: All public endoscopy units in NZ supplied data. N2O use was reported at Bay of Plenty, Waitemata, Whanganui, Northland, and Taranaki DHBs. Five other units are considering its use. A total of 1151 endoscopic procedures used N2O sedation; 89% colonoscopies, 10% flexible-sigmoidoscopies, 1% other. Usage rose over time; 82 procedures in 2017, 118 in 2018, 153 in 2019, 342 in 2020 and 456 in 2021. Emissions from the use of N2O were estimated to be 34kg CO2e per colonoscopy, and 17kg CO2e per flexible-sigmoidoscopy/other; 37.0 tonnes CO2e total.
Conclusion: N2O use during endoscopy in NZ constitutes a small fraction of all procedures, but usage is rising by a median of 44% (range 30-123%) per annum. Emissions attributable to N2O over the studied period totalled 37.0 tonnes CO2e, equating to 184000 km driven in a petrol vehicle. Whilst the benefits of N2O may be considerable, its climate impact cannot be ignored. The use of this agent in public hospitals will, in time accrue a significant offset cost, so effective alternatives must be investigated.

Bioelectrical mapping of the in vivo gastrointestinal junction using anatomically-specific electrode arrays: towards novel biomarkers for pyloric dysfunction

Simmonds S[1], Cheng L[1], Ruha W[1], Taberner A[1,2], Du P[1,2], Angeli-Gordon T[1,3]
[1]Auckland Bioengineering Institute, University of Auckland, Auckland, New Zealand, [2]Department of Engineering Science, University of Auckland, Auckland, New Zealand, [3]Department of Surgery, University of Auckland, Auckland, New Zealand.
Background: There are few relevant clinical biomarkers to support diagnosis and treatment of gastrointestinal disorders. Rhythmic bioelectrical 'slow waves' are a key mechanism underpinning digestive contractions, and the pylorus acts to electrically demarcate the stomach and duodenum. The pyloric region is therefore a key target for novel diagnostic and therapeutic tools for gastrointestinal disorders. In this study we aimed to develop and validate a technique for high-resolution electrical mapping across the gastroduodenal junction, in vivo for the first time.
Methods: A 3D-printed cradle, anatomically-specific to the gastrointestinal junction, was designed to house flexible-printed-circuit arrays (256 electrodes, 4-5 mm apart). Cradle geometry was initially based on multi-plane MRI of a pig stomach and refined iteratively using in vivo measurements. Ethical approval was obtained from the University of Auckland Animal Ethics Committee. Following anaesthesia with isoflurane and midline laparotomy, the cradle was applied in vivo in cross-weaner pigs (N=8; (45.2 ± 9.0) kg) to simultaneously map slow wave activation across the antrum, pylorus, and duodenum ((154.3 ± 40.4) s per recording). Statistical significance was determined using the 2-tailed Student's t-test, with significance threshold $p < 0.05$.
Results: The stomach and duodenum had significant differences in slow wave frequency ((2.60 ± 0.37 vs. 17.8 ± 0.53) cpm), velocity ((4.93 ± 0.20 vs. 11.5 ± 1.53) mm s-1), and amplitude ((1.08 ± 0.26 vs. 0.34 ± 0.03) mV). The pyloric sphincter was consistent with a (46.4 ± 6.3) mm wide electrically quiescent zone, and the proximal duodenal pacemaker was mapped (9.11 ± 7.23) mm distal to this region.
Conclusion: This study demonstrates a method for high-resolution electrical mapping of the pyloric region, in vivo for the first time. This novel technique captures sufficient spatiotemporal details to identify dysrhythmic electrical patterns and could be applied to define new biomarkers of pyloric dysfunction in gastrointestinal disorders.

Biomarkers in the early prediction of rescue therapy in acute severe colitis

Chen K[1], Kamiya S[1], Yap S[1], Neave H[2], Walmsley R[1], Schauer C[1], Atkinson N[1]
[1]Department of Gastroenterology, North Shore Hospital, Te Whatu Ora – Health New Zealand Waitemata, Auckland, New Zealand, [2]Research and Knowledge Centre, North Shore Hospital, Te Whatu Ora – Health New Zealand Waitemata, Auckland, New Zealand.
Background: Acute severe colitis (ASC) due to inflammatory bowel disease is a medical emergency managed with intravenous corticosteroids as first line therapy. In Auckland centres up to 36% of patients still require rescue therapies, whilst the widely used Oxford criteria predict response only after 3 days of treatment. We report the results of a study examining the association of early biomarkers and the need for rescue therapy in ASC.
Methods: A single centre retrospective cohort of inpatients with ASC treated with intravenous steroids from a New Zealand hospital over 12 months were reviewed. Data on their admission C-reactive protein, albumin and calculated C-reactive protein/ albumin ratio (CAR) were collected. Faecal calprotectin (FC) results either on admission or within the prior 4 weeks were collected if available within this cohort. The need for rescue therapy was defined as cases requiring biologic agents, cyclosporin or surgery despite intravenous steroids. Statistical comparisons were made using the Mann-Whitney U test.
Results: 108 cases were included (40 female; mean age 39.9 years +/- 18.7) of which 35 cases had an admission or recent FC. 22 cases needed rescue therapy (20.4%). The CAR was significantly different between the rescue group (median 1.12 (0.50 – 3.92)) and the non-rescue group (median 0.51 (0.16 – 1.87)), p value 0.032. However, admission and recent FC in the 35 cases were not significantly different between the rescue group (n=9, median 1180mcg/g (234 – 3860)) and the non-rescue group (n=26, median 1090mcg/g (244.25 – 3657.5)), p value 0.956.
Conclusion: This study supports the predictive value of CAR on admission of ASC patients in determining the likelihood

of needing rescue therapy. We did not identify a predictive value of FC in ASC.

Biopsy-free diagnosis of coeliac disease in children: an audit of the first 3 years of experience

Evans H[1,2], Lopez R[1,2], Mouat S[1], Roberts A[1,2], Bishop J[1,2]
[1]Starship Child Health, Te Toka Tumai, Auckland, New Zealand, [2]Department of Paediatrics, The University of Auckland, Auckland, New Zealand.

Background: In 2012, The European Society of Pediatric Gastroenterology, Hepatology and Nutrition (ESPGHAN) published evidence-based criteria stating that biopsy-free diagnosis (BFD) of coeliac disease is possible in children with highly positive coeliac serology on two separate blood samples. We previously validated these criteria in the Auckland paediatric population and commenced BFD for children fulfilling criteria in 2018. The aim of this audit was to evaluate practice outcomes following 3 years of BFD.
Methods: An ethics waiver was granted for audit purposes. All children referred with possible coeliac disease September 2018–December 2021 were identified and included if they underwent a BFD meeting criteria or endoscopic biopsy. Cases were analysed for demographic differences, diagnostic yield and time to diagnosis.
Results: 307 children were referred (175 female; median age 8.0 years (1.4-16.2)). 172 children had initial coeliac serology fulfilling ESPGHAN criteria and 154 underwent BFD at a median of 29 days after initial referral (0-146). 1 requested a biopsy diagnosis. 12 children were lost to follow-up between referral and second confirmatory serology. 5 children required endoscopic diagnosis as their second coeliac serology did not fulfil criteria. All had coeliac disease on biopsy. Of 126 whose initial coeliac serology did not fulfil criteria, 57 (49%) had coeliac disease on endoscopy. 9 were lost to follow-up between referral and endoscopy. Median time to diagnosis was 61 days (1-377). There were no demographic differences between groups. Total cost savings were $693,000.
Conclusion: Our results suggest that BFD is possible in 56% of children with possible coeliac disease. BFD can be made quickly but improvements need to ensure loss to follow-up after initial referral is minimised. Cost savings with this approach are considerable and a questionnaire study is underway to ensure patient and family satisfaction with the biopsy-free approach.

Body surface gastric mapping defines neuromuscular dysfunction in patients with nausea and vomiting syndromes

Daker C[1], Calder S, Gharibans A, Varghese C, Carson D, Waite S, Woodhead J, Schamberg G, Windsor J, Andrews C, O'Grady G
[1]Waitematā District, Auckland, New Zealand, [2]Alimetry, Auckland, New Zealand.

Background: Gastroparesis and chronic nausea and vomiting syndromes have unclear etiology. Neuromuscular (NMF) function abnormalities, including interstitial cell of Cajal deficits feature in these diseases which are suspected to lie on the same disease spectrum. Unable to distinguish these abnormalities, gastric emptying studies have controversial utility. The new diagnostic body surface gastric mapping (BSGM, Gastric Alimetry (GA)) provides direct biomarkers of gastric neuromuscular activity. Define gastric neuromuscular abnormalities in nausea and vomiting syndromes (NVS) compared to controls using BSGM.
Methods: 42 age, sex, and BMI matched NVS patients to 42 healthy controls underwent BSGM using GA. A fasted 30-minute baseline recording preceded a standardized 482 kcal meal, and 4 hours of post-prandial recording with continuous symptom logging via a validated App.
Results: NVS patients showed NMF abnormalities compared to controls, including attenuated amplitudes (median 23.6 vs 37.1 μV postprandially; $p<0.001$) and impaired meal responses (fed to fasting power ratio of 1.2 vs 1.6; $p=0.013$). Novel spatial biomarkers revealed unstable myoelectrical activity in NVS, with reduced spatial frequency stability (13.6 vs 50.6; $p<0.001$), and reduced average spatial covariance (0.49 vs 0.52; $p=0.002$). Dominant frequency variance was greater in patients (s.d. 0.7 vs 0.4; $p<0.001$). However, a significant patient subgroup (45.2%) showed normal (n=15) or hyperactive (n=1) gastric activity, with all biomarkers comparable to controls ($p>0.1$). This suggests more than one phenotype within the NVS cohort. NMF biomarkers correlated with symptoms (excessive fullness, early satiety, bloating, heartburn, nausea, pain, and GCSI score all $r>0.4$; $p<0.05$).
Conclusion: BSGM is a new test of gastric function. NVS patients frequently demonstrated gastric NMF abnormalities, characterized by weaker gastric activity, impaired meal responses, and spatially unstable myoelectrical activity, correlating with symptoms. However, 45% of NVS patients had normal gastric activity, indicating other disease phenotypes. These data show that GA can demonstrate different NVS disease phenotypes.

Candesatran cilexetil modulates hepatic NOSTRIN-eNOS pathway and ameliorates portal pressure in acute-on chronic liver failure

Vairappan B, Wright G, Mohandas S
Jawaharlal Institute of Postgraduate Medical Education and Research, Pondicherry 605008, India.

Background: In decompensated cirrhosis, severity of portal hypertension (PHT) is associated with increased hepatic endothelial nitric oxide synthase (eNOS) trafficking inducer (NOSTRIN); although the mechanism remains unclear. Establish whether in cirrhosis-PHT models, superimposed inflammation (to mimic acute-on-chronic liver failure - ACLF) modulates hepatic NOSTRIN expression, nitric oxide (NO) synthesis and/or endothelial dysfunction (ED). Secondarily, whether the 'Angiotensin II type-1 receptor blocker' Candesartan Cilexetil (CC), effects this pathway.

Methods: Normal and cirrhotic liver specimens obtained during surgery of cirrhotic patients. In addition, CD-1 mice received carbon tetrachloride injections (CCl4 15% v/v corn oil, 0.5 ml/kg, twice-weekly i.p.) for 13-weeks to induce cirrhosis. After 3-months, mice were randomized to 2-weeks oral administration of CC (8mg/kg) or DMSO ± LPS. In both models at sacrifice, plasma (biochemical, cytokines and angiotensin II) and liver tissues (histopathology and Sirius-red stains) were analysed.
Results: When compared to controls, human cirrhotic liver and CCl4 animals showed markedly elevated hepatic NOSTRIN expression ($p<0.05$ and $p<0.0001$, respectively), while hepatic peNOS expression (measure of eNOS activity) was significantly reduced ($p<0.05$, respectively). LPS-challenge further increased NOSTRIN and reduced peNOS expressions ($p<0.05$) in cirrhotic animals. Portal pressure and subsequent intrahepatic vascular resistance were also increased in cirrhotic animals following LPS-challenge. On confocal microscopy NOSTRIN and eNOS was primarily within hepatic vascular endothelial cells. CC-treatment to CCl4±LPS showed significantly reduced NOSTRIN ($p<0.05$) and increased hepatic NO ($p<0.01$). eNOS, iNOS and caveolin-1 protein expressions were significantly increased in CCl4 animals. CC-treatment non-significantly lowered eNOS/iNOS expression; although caveolin-1 expression was unaltered.
Discussion: This study is the first to indicate a potential mechanistic association between NOSTRIN-NO pathways in cirrhosis and ACLF development. Moreover, this pathway provides a potential therapeutic target given the ameliorative response to Candesartan treatment. Indeed, further large-scale human studies required.

Case report: endoscopic management of ingested foreign body perforation

Clemente J, Melton A
Middlemore Hospital, Auckland, New Zealand.

Background: Foreign body ingestion can result in perforation of the gastrointestinal tract, especially with sharp objects such as chicken bones and fish bones. The most common sites of perforations are the ileocaecal junction and the sigmoid colon.
Case: We describe the case of Mr B, an 82-year-old male who presented to Middlemore Hospital with worsening lower abdominal pains and vomiting. His background history included hypertension and dyslipidaemia. Blood tests showed elevated inflammatory markers (WBC 8, CRP 37). A CT abdomen was performed which identified a foreign body (50mm x 4mm) within the mid sigmoid colon, perforating the colon posteriorly adjacent to the peritoneal reflection overlying the left external iliac vessels. Surrounding inflammatory soft tissue thickening was seen, with no collection or free air.
Management:
Mr B was admitted under the Surgical Service and given antibiotics. After careful consider, surgical intervention was considered high risk, so endoscopic management was attempted. Under light sedation, the colonoscope was inserted into the sigmoid colon and a chicken bone was identified firmly lodged in the sigmoid colon, perforating through a diverticulum at the posterior aspect and firmly lodged in another diverticulum at the proximal end. The bone was unable to be removed with forceps, so thermal therapy (APC and hot forceps) were used to break the chicken bone in half allowing successful removal in two pieces.
Conclusion: Endoscopic devices such as biopsy forceps, snares, and thermal therapy treatments, are specifically designed for use on soft, mucosal gastrointestinal tissue. They are not engineered to perform an osteotomy on hard, bone tissue. Cutting through the chicken bone endoscopically using the tools available, required careful consideration and ingenuity.

Characteristics of colorectal cancer patients in South Auckland Post National Bowel Screening Programme

Law D[1,2], Huang J[2]
[1]Waikato Hospital, Hamilton, New Zealand, [2]Middlemore Hospital, Auckland, New Zealand.

Background: The National Bowel Screening Programme (NSBP) was introduced to Counties Manukau District Health Board in July 2018. Patients' characteristics with colorectal cancer (CRC) in South Auckland were previously reviewed in 2013 (Hsiang et. al). We performed a comparative study to review the changes in incidence and patients' characteristics in CRC since the introduction of the NBSP.
Method: Patients with confirmed colorectal cancer from July 2018 to December 2020 were identified through data collected at the local surgical multidisciplinary meeting. Patients' characteristics including demographic and presenting features were retrospectively collected through electronic clinical records. Incidence rates were compared within a log-linear model of yearly counts with log offsets, an ethnicity interaction term and a sandwich estimator of variance.
Results: 541 patients were identified. Rectal bleeding (27.4%) remained the most common presenting symptom. The previous finding of constipation being a common presenting feature in Pacifica was not seen in our study. However, we found weight loss to be more frequently encountered in Asians (66.7% vs 22.9%, $p<0.01$). The annual incidence increased in all ethnicity except European, with triple the rate in Maori (17.9 vs 57.7) and double in Asian (12.4 vs 29.8) and Pacifica (17.7 vs 35.2). Rate of advanced CRC and non-operative management remains higher in non-European groups. The proportion of patients presenting as acute inpatient reduced from 39.0% to 26.2% since NBSP was introduced, with 23.7% of CRC diagnosed via NBSP.
Conclusion: We observed a reduction in acute presentation of CRC since NBSP. However, the incidence and rate of advanced cancer on presentation remain high, particularly in non-European population. Further improvement in equity needs to be made through actions such as the recent lowering of age to access NBSP in Maori and Pacifica.

Characterization of tumor responses in patients (pts) with unresectable hepatocellular carcinoma (uHCC) treated with lenvatinib in REFLECT

van Rensburg M[1], Finn R[1], Qin S[2], Piscaglia F[3], Vogel A[4], Evans T[5], Knox J[6], López C[7], Ramji Z[8], Ren M[8], Mody K[8], Kudo M[9]

[1]Geffen School of Medicine, UCLA Medical Center, Santa Monica, USA, [2]Nanjing Bayi Hospital, Nanjing, Jiangsu, China, [3]University of Bologna, Bologna, Italy, [4]Hannover Medical School, Hannover, Germany, [5]University of Glasgow, Beatson West of Scotland Cancer Centre, Glasgow, UK, [6]Princess Margaret Cancer Centre, Toronto, Ontario, Canada, [7]Marqués de Valdecilla University Hospital, IDIVAL, Santander, Spain, [8]Eisai Inc., Nutley, USA, [9]Kindai University Faculty of Medicine, Osaka-Sayama, Japan.

Background: In REFLECT, lenvatinib was noninferior to sorafenib based on overall survival in pts with uHCC (median 13.6 vs 12.3 months; hazard ratio 0.92, 95% CI 0.79–1.06). The objective response rate (ORR) with lenvatinib was 18.8% by blinded independent imaging review (IIR) per RECIST v1.1; per modified RECIST, the ORR was 40.6%. Here, we sought to further characterize the tumor responses of these pts.

Methods: ORR assessments included all pts randomly assigned to lenvatinib treatment (12 mg/day for bodyweight ≥60 kg or 8 mg/day for bodyweight <60 kg). Time to first objective response (TTR) and duration of response (DOR) were calculated among pts who achieved a partial or complete tumor response. Tumors were assessed by IIR per RECIST v1.1 or modified RECIST. Median (m)DOR was estimated via the Kaplan-Meier product-limit method, 95% CI via a generalized Brookmeyer and Crowley method.

Results: 478 Pts were randomly assigned to receive lenvatinib; among the 90 (18.8%) who achieved an objective response by IIR per RECIST v1.1, mTTR was 2.8 months (range 1-29) and mDOR was 7.4 months (95% CI 5.6-9.2). Of the 194 pts who had an objective response by IIR per modified RECIST, mTTR was 1.9 months (range 1-15) and mDOR was 7.3 months (95% CI 5.6-7.4). We report ORRs by selected baseline characteristics below.

Conclusion: Pts with uHCC treated with lenvatinib achieved objective responses with a similar frequency to single-agent immune checkpoint inhibitors. These responses occurred irrespective of baseline characteristics. Tumor responses occurred early and were durable.

Clinicaltrials.gov identifier: NCT01761266

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Baseline characteristic	ORR, n/m (%)	
	RECIST v1.1 by IIR	mRECIST by IIR
Age (years):		
<65	47/270 (17.4)	105/270 (38.9)
≥65-75	28/150 (18.7)	62/150 (41.3)
≥75	15/58 (25.9)	27/58 (46.6)
Sex:		
Male	75/405 (18.5)	163/405 (40.2)
Female	15/73 (20.5)	31/73 (42.5)
Body weight (kg):		
<60	25/153 (16.3)	63/153 (41.2)
≥60	65/325 (20.0)	131/325 (40.3)
ECOG PS:		
0	66/304 (21.7)	129/304 (42.4)
1	24/174 (13.8)	65/174 (37.4)
AFP at baseline (ng/mL):		
<200	56/255 (22.0)	122/255 (47.8)
≥200	34/222 (15.3)	72/222 (32.4)
MPVI, EHS, or both:		
Yes	61/329 (18.5)	113/329 (34.3)
No	29/149 (19.5)	81/149 (54.4)
BCLC staging:		
Stage B	23/104 (22.1)	59/104 (56.7)
Stage C	67/374 (17.9)	135/374 (36.1)
Etiology:		
HBV	44/259 (17.0)	99/259 (38.2)
HCV	27/103 (26.2)	49/103 (47.6)
Alcohol	5/33 (15.2)	11/33 (33.3)

AFP, alpha fetoprotein; BCLC, Barcelona Clinic Liver Cancer; EHS, extrahepatic spread; m, number of patients in category; MPVI, macroscopic portal vein invasion; n, number of patients with complete or partial response.

Clinical characteristics of autoimmune liver disease associated hepatocellular cancer: a New Zealand cohort analysis

Dyavadi V[1], Swaminathan A[1,2], Gane E[1,3]

[1]New Zealand Liver Transplant Unit, Auckland, New Zealand, [2]University of Otago, Dunedin, New Zealand, [3]University of Auckland, Auckland, New Zealand.

Background: Autoimmune liver disease (AuLD) is a risk factor for hepatocellular carcinoma (HCC), a primary liver cancer associated with significant morbidity and mortality. This study aimed to describe clinical characteristics of patients with HCC associated with autoimmune liver disease (AuLD-HCC) in a nationwide wide cohort.

Methods: New Zealand patients aged ≥18 years with AuLD-HCC were retrospectively reviewed from a national database of all patients referred to an HCC multi-disciplinary meeting between 1998-2020. Autoimmune liver disease (AuLD) included autoimmune hepatitis (AIH), primary biliary cholangitis (PBC), primary sclerosing cholangitis (PSC) and overlap syndromes. Univariable and multivariable logistic regression identified baseline variables that predicted 1-year mortality.

Results: Of the 2795 cases of HCC, 31 (1.1%) were patients with AuLD-HCC were identified; median age 70 years, 14 males, 24 European ethnicity, 9 obese and 6 had existing type 2 diabetes. Subgroup analysis identified 8 AIH, 13 PBC, 6 PSC and 3 AIH/PBC overlap syndrome patients. Screening identified AuLD-HCC in 25/31 patients; 30/31 had advanced fibrosis at HCC diagnosis (METAVIR ≥F3); and 13/31 had curative treatment (1 resection, 7 ablation, 5 transplant). Median time to death was 10.5 months (IQR); 26 patients died during the study of which 14 died 1 year post HCC

diagnosis. Multivariable logistic regression identified age (ORmultivariable=1.19, p=0.02) and curative therapy (ORmultivariable=0.09, p=0.02) as the only clinical factors predicting 1-year mortality.

Conclusion: AuLD is a rare cause of HCC in this New Zealand cohort. This study provides an up-to-date descriptive analysis of patients with AuLD-HCC. Baseline age and curative therapy predicted 1 year mortality in AuLD-HCC patients.

Clinical characteristics of patients with hepatocellular cancer secondary to cryptogenic liver disease in comparison with metabolic-associated fatty liver disease

Dyavadi V[1], Swaminathan A[1,2], Gane E[1,3]

[1]New Zealand Liver Transplant Unit, Auckland, New Zealand, [2]University of Otago, Dunedin, New Zealand, [3]University of Auckland, Auckland, New Zealand.

Background: Cryptogenic liver disease (CLD) is thought to be a burnt-out form of metabolic-associated fatty liver disease (MAFLD) and both are considered risk factors for hepatocellular carcinoma (HCC). This study investigated whether clinical characteristics of patients with HCC cases associated with CLD (CLD-HCC) were similar to HCC cases associated with MAFLD (MAFLD-HCC) in a nationwide wide cohort.

Methods: New Zealand patients aged ≥18 years with CLD-HCC and MAFLD-HCC were retrospectively reviewed from a national database of all patients referred to an HCC multi-disciplinary meeting between 1998-2020. Categorial variables were compared with Fisher's exact test and continuous variables were compared with Mann-Whitney U test to identify statistically significant differences between these 2 cohorts.

Results: 170 patients with CLD-HCC and 295 patients with MAFLD-HCC were identified; median age 71 vs 72 years (p=0.25), 109(40.4%) vs 220(74.6%) males (p=0.02), 118(69.4%) vs 196(66.4%) European ethnicity (p=0.319), 31(18.2%) vs 173(58.6%) obese (p<0.001) and 44(25.9%) vs 218(73.9%) (p<0.001) had existing type 2 diabetes. Surveillance identified CLD-HCC in 15(8.8%) vs MAFLD-HCC in 76(25.8%) patients (p<0.001); 48(28.2%) vs 200(67.8%) (p<0.001) had advanced fibrosis at HCC diagnosis (METAVIR ≥F3); and 41(24.1%) vs 86(30.2%) (p=0.28) had curative treatment (35 vs 31 resection, 5 vs 33 ablation, 1 vs 22 transplant). 140(82.4%) patients with CLD-HCC and 212(71.9%) MAFLD-HCC patients died during the study (p=0.013). Median time to death was 6 vs 10 months respectively (p=0.02).

Conclusion: Patients with CLD-HCC were less likely to be male, obese and have type 2 diabetes at HCC diagnosis compared to those with MAFLD-HCC. Rates of HCC surveillance and advanced fibrosis were less common in CLD-HCC. Lower surveillance did not lead to less patients receiving curative therapies. Survival was shorter in CLD-HCC patients in comparison to those with MAFLD-HCC. Further studies should elucidate whether patients with CLD may reflect those with underlying lean-MAFLD.

Colorectal cancer surveillance in IBD - an audit of methods and

Characteristic	All (n=301)		WLE (n=258)		DCE (n=43)	
Age (y)	46.8		46.2		50.3	
Female (n)	137	45.5%	124	48.1%	13	30.2%
Disease type						
UC	186	61.8%	78	30.2%	36	83.7%
Crohns	110	36.5%	103	39.9%	7	16.3%
IBD-U	5	1.7%	5	1.9%	0	0.0%
Duration of disease						
Median (years)	13	4.3%	13	5.0%	17	38.4%
<8y	50	16.6%	47	18.2%	3	7.0%
8-15y	119	39.5%	103	39.9%	16	37.2%
16-25y	71	23.6%	58	22.5%	0	0.0%
>25 years	61	20.3%	50	19.4%	10	23.3%
Disease extent						
Pancolitis	80	26.6%	70	27.1%	19	44.2%
Left sided colitis	61	20.3%	61	23.6%	11	25.6%
Extensive colitis	11	3.7%	5	1.9%	3	7.0%
Ileocolonic crohns	73	24.3%	69	26.7%	3	7.0%
Family history	14	4.7%	11	4.3%	3	7.0%
PSC	32	10.6%	25	9.7%	7	16.3%
Mucosal inflammation						
None	156	51.8%	127	49.2%	28	65.1%
Mild (mayo 1, UCEIS 1-3, SES-CD 3-6)	116	38.5%	104	40.3%	13	30.2%
Moderate (mayo 2, UCEIS 4-6, SES-CD 7-15)	18	6.0%	16	6.2%	2	4.7%
Severe (Mayo 3, UCEIS 7+, SES-CD >16)	12	4.0%	12	4.7%	0	0.0%
Non-polypod dysplastic lesions						
Patients with non-polypoid dysplastic lesions detected	2	0.7%	2	0.8%	0	0.0%
Number of nonpolypoid dysplastic lesions	2	0.7%	2	0.8%	0	0.0%
Polypoid dysplastic lesions						
Patients with polypoid dysplastic lesions detected	37	12.3%	31	12.0%	6	14.0%
Number of tubular adenoma	35		28		7	
Number of tubulovillous adenoma detected	4		4		0	
Number of SSP	43		40		3	
Cancer	2	0.7%	2		0	

outcomes of surveillance in CCDHB from 30/4/18 to 1/5/22

Abdulhamid A
CCHB, Wellington, New Zealand.

Background: Inflammatory bowel disease (IBD) is a well-recognised and potent risk factor for early colorectal cancer (CRC). Historical data estimate an approximately 18% risk of CRC at 30 years of colitis, compared to 0.87-1.8% in the general population. Accordingly, considerable effort has been afforded to advise and revise endoscopic surveillance strategies to identify premalignant dysplastic changes1. This audit of the last 48 months of surveillance endoscopies in Wellington Hospital Gastroenterology ending 30th April 2022 serves to assess the methods and outcome of CRC surveillance as compared to consensus guidance

Methods: Endoscopy indicated for CRC surveillance in IBD from Wellington Hospital from 30/4/18 to 1/5/22 were collected from ProVation ding the data reporting function. These studies were retrospectively analysed and data collected relating to demographics, method of endoscopic surveillance, endoscopic findings, and dysplasia detection.

Results: (Table)

Discussion: There is considerable variation amongst gastroenterologists in choice of modality in CRC surveillance ad only 26% in accordance with guidelines. Though dysplasia detection rates were not meaningfully different amongst modalities, there was a notably low levels of dysplasia detected when compared to international studies for CRC surveillance of between 13-18%. This study highlighted the lack of formal kpi targets and the need to evaluate local protocols in surveillance and to implement local recommendations including enforced 3 point lists, random biopsies for high risk patients, and enforced longer withdrawal times. Detection rate over the coming 12 months will then be prospectively assessed.

Commercial composting - the forgotten waste steam

Dixon A[1,2]
[1]*Ormiston Hospital, Auckland, New Zealand,* [2]*Endoscopy Auckland, Epsom, New Zealand.*

Currently healthcare, in particular endoscopy, is one of the biggest producers of single use plastic waste in the world and we need to change this in our journey to greener endoscopy.

The five R's - Refuse, Reduce, Reuse, Repurpose and Recycle are now at the forefront of our minds as we grapple with increasing landfills that render valuable food growing land useless, global warming and the devastating effects of climate change. Recycle is a misnomer which makes people feel like we are doing the right thing but recycling is no panacea, what we need to be doing is refusing to use plastics and inorganics.

But how when so much of what we use in healthcare needs to be single use and easily disposed? This is where commercial composting as a waste steam comes into play. Swapping out single use plastic items for organic alternatives to decrease not only recycling waste but landfill waste in large volumes.

A case study of implementation of commercial composting in a busy private endoscopy unit over the last 3 years demonstrates how to decrease landfill waste by half overnight by swapping out many single use plastic consumables, ongoing education and careful placement of bins. More than what we think can go into compost including all organic consumables, food waste, coffee grounds, newspapers and paper towels which is a huge volume of our daily waste.

It is time to take climate change and green endoscopy seriously and make changes now to decrease our single use plastic waste and landfill waste. We all want to decrease healthcare waste but recycling is not going to cut the mustard but composting not only will cut the mustard it will also help grow it and other crops in the future.

Current perspective on the management of acute severe ulcerative colitis (ASUC): 5-year experience from Wellington Regional Hospital

Dalkie N, Griffiths B
Capital and Coast DHB, Wellington, New Zealand.

Background: This audit reviews the current management of ASUC at a tertiary centre in order to optimise future care and inform the development of practice guidelines.

Methods: A retrospective audit of adult patients, discharged from Wellington Hospital between January 2016 and December 2020 with ASUC, defined using Truelove and Witts criteria. Laboratory results, management and clinical outcomes were analysed.

Results: There were 62 admissions during the audit period. Median number of Truelove and Witts criteria met was 2, most commonly elevated CRP (79%). Intravenous hydrocortisone was given to 56 patients (90.3%), and methylprednisolone to 6 patients (9.7%) with no difference in rates of rescue therapy, readmission, or colectomy. Day 3 Oxford criteria was met in 28 patients, with 21 receiving rescue therapy; 16 others also received rescue therapy. Medical rescue was with infliximab in 29 patients and oral cyclosporine in 8. Colectomy rate was 50% in patients given cyclosporine, compared to 16.7% for infliximab. 31 (50%) patients achieved complete response, 25 (40%) incomplete response, and 6 (10%) had colectomy. 15 patients were readmitted within 6 months, with significant predictors being elevated day 7 platelet count (p=0.021), and incomplete clinical response (p=0.035). 7 further patients underwent colectomy during readmission bringing the total colectomy rate to 21%. Predictors of colectomy included day 1 CRP (87.0 vs 48.6, p=0.007), day 7 stool frequency (5.9 vs 3.5, p=0.008), day 7 CRP (22.8 vs 7.3, p=0.0006), day 7 haemoglobin (101 vs 114, p=0.049), and meeting Day 3 Oxford criteria (p=0.026).

Conclusion: The longer term colectomy rate in patients with ASUC remains high despite aggressive medical management. Variation in practice highlights the need for management guidelines.

Defining and phenotyping gastric abnormalities in patients with long-

term type 1 diabetes using body surface gastric mapping

Xu W[1], Gharibans A[1,2], Calder S[1,2], Schamberg G[1,2], Walters A[3], Jang J[1], Varghese C[1], Carson D[1], Daker C[2], Waite S[2], Cundy T[5], Andrews C[4], O'Grady G[1,2,6]
[1]University of Auckland, Auckland, New Zealand, [2]Alimetry Ltd, Auckland, New Zealand, [3]Liggins Institutde, Auckland, New Zealand, [4]Department of Gastroenterology, Auckland, New Zealand, [5]Department of Medicine, Auckland, New Zealand, [6]AucklandBioengineering Institute, Auckland, New Zealand.

Background: To define specific phenotypes of gastric abnormalities and their symptom correlations in patients with T1D, compared to matched healthy controls, using a novel non-invasive body surface gastric mapping (BSGM) device.
Methods: BSGM (Gastric Alimetry, Alimetry, New Zealand) was performed on patients with T1D of >10 years duration and matched controls, employing a high-resolution 64-channel array, validated symptom logging App, and wearable reader. Continuous blood glucose measurements were performed.
Results: 32 patients with T1D were recruited (15 with a high symptom burden; 17 without), along with 32 controls. Symptomatic patients showed marked abnormalities in gastric slow waves, with reduced 'Gastric Alimetry Rhythm Index' (0.39 vs 0.51, p = 0.017) and spatial organisation of gastric wavefronts (average 'spatial covariance' 0.48 vs 0.51 in controls; p = 0.009). Symptomatic patients had higher HbA1c levels (75.6 mmol/mol vs 56.0, p<0.001), prevalence of peripheral neuropathy (66.7% vs 5.9%, p=0.001), and anxiety/depression diagnoses (26.7% vs 0%, p = 0.001) compared to patients without significant symptoms. BSGM analysis defined specific phenotypes of patients with abnormal and unstable gastric rhythms and weak meal responses (4/32, 12.5%), and patients with abnormally high gastric frequencies (10/32, 31.3%).
Conclusion: Gastroduodenal symptoms in T1D patients correlate with gastric myoelectrical abnormalities on BSGM evaluation, in addition to glycaemic control, psychological comorbidities, and peripheral neuropathy. BSGM using the Gastric Alimetry device identifies a range of specific disease phenotypes in patients with T1D, likely representing myogenic and neurogenic mechanisms, which present targets for diagnosis, monitoring and therapy.

Diagnosing coeliac disease without duodenal biopsies - what we could learn from paediatrics

Morgan S
Taranaki District Health Board, New Plymouth, New Zealand.

Background: For a diagnosis of coeliac disease (CD) the British Society of Gastroenterology1 (BSG) recommends serological testing of anti-TTG IgA combined with a biopsy demonstrating CD-type histology. However, paediatric guidelines2 recommend symptomatic children with an anti-TTG IgA ten times the upper limit of normal (ULN) on two separate occasions, receive a diagnosis of coeliac disease without histological confirmation. This retrospective review assesses if paediatric guidelines could have been safely applied to diagnose CD in the adult population.
Methods: A retrospective review of positive anti-TTG IgA results generated in NHS Fife in 2016. These results were then correlated with histology from duodenal biopsies and the subsequent diagnosis received by the patient. This information was gathered in accordance with local ethical guidelines.
Results: There were 376 positive anti-TTG IgA results within NHS Fife in the year 2016. After exclusion of 258 patients, 118 patients went onto duodenal biopsy. Of these 118 patients, 21 had an anti-TTG more than ten times the ULN. 19 of the 21 patients had CD-type pathology on oesophgeal-gastro-duodenoscopy (OGD) corroborating the diagnosis. The remaining 2 patients had been following a gluten free diet and were symptomatically diagnosed. Importantly, none of the patients in this cohort had malignant or pre-malignant findings on OGD that might have been missed had a no-biopsy approach been adopted.
Conclusion: High anti-TTG IgA levels in the presence of symptoms suggestive of CD could be utilised to give a diagnosis of CD without the need for potentially invasive, uncomfortable and costly duodenal biopsies. With the number of endoscopy referrals rising3, a non-biopsy approach to the diagnosis of coeliac disease could potentially reduce waiting times without compromising patient safety.

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Effects of a unique grain fibre fortified bread on intestinal microbiota composition of healthy adults with low dietary fibre intake

Ng H[1], Maggo J[1], Wall C[1], Bayer S[1], Gearry R[1], Roy N[2]
[1]University of Otago, Christchurch, New Zealand, [2]University of Otago, Dunedin, New Zealand.

Background: A unique grain fibre fortification in bread increases its dietary fibre (DF) content. No trials, have studied the effects of using this unique grain fibre in bread on intestinal microbiota composition and gas fermentation profiles in healthy adults with low DF intake.
Methods: This is a two-armed, placebo-controlled, double-blind, randomised, crossover study approved by the University of Otago Human Ethics Committee, Health (H22/061) and registered at ANZCTR (ACTRN12622000884707). The study duration is 14-weeks:

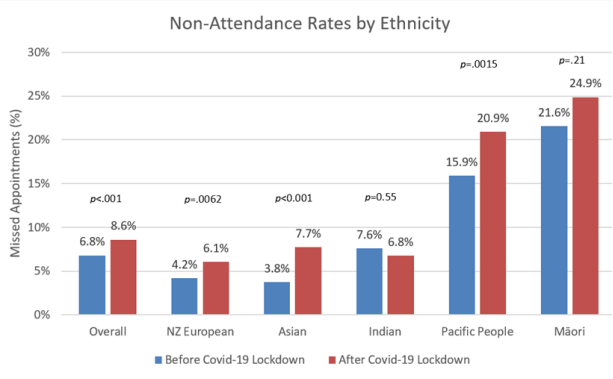
2-weeks lead-in, 4-weeks intervention per phase, 2-weeks washout, and 2-weeks follow up. 60 healthy adults with low DF intake (<18 g/d (females), <22 g/d (males)) will be recruited. Participants will consume three (females)/ four (males) slices per day of the fortified, then placebo white toast bread or vice versa. Before and after each intervention phase, participants will provide stool and blood samples, complete a three-day food diary and questionnaires (gut symptoms, general wellbeing, daily bread and bowel movement), undergo anthropometry and blood pressure measurements, and drink blue food dye. From the existing cohort,15 selected participants will ingest Atmo gas-sensing capsule. The primary study outcome is the differences in relative abundance of a composite of key genera and species in stool samples; subsidiary outcomes are changes in clinical (digestive comfort, general wellbeing, cardiovascular risk profile, total DF intake), biological (predictive function of the gut microbiome, stool and plasma metabolome and metabolites), physiome (whole gut transit time and gas fermentation profiles) following fortified bread intervention.

Results: Recruitment began in June 2022. To date, we have enrolled 60 participants. Data will be analysed upon study completion. Results will be presented at relevant scientific conferences and published in peer-reviewed journals.
Conclusion: This study will offer insights into the prospect of consuming a unique grain fibre fortified bread to effectively promote health-promoting gut bacteria, general health, and DF intake in healthy adults with low DF intake.

Effects of COVID-19 on endoscopy non-attendance rates

Fox T, Wei H
Gastroenterology Department, Auckland City Hospital, Auckland, New Zealand.

Background: Non-attendance at endoscopy can result in diagnostic delays and wasted resources in an already overwhelmed public healthcare system. We assessed predictors of non-attendance and how the COVID-19 pandemic has affected non-attendance rates.
Methods: All outpatient gastroscopy, colonoscopy, and flexible sigmoidoscopy procedures between January 2019 and May 2022 at Auckland District Health Board were analysed. Bowel cancer screening participants were excluded. Fisher's exact test and logistical regression were performed to compare groups. We also analysed non-attendance characteristics before and after 25th March 2020, when the New Zealand (NZ) government first declared a state of National Emergency in response to the COVID-19 pandemic.
Results: A total of 21,557 appointments were captured, with 1569 non-attendances, giving a non-attendance rate of 7.28%. Non-attenders were more likely to be male (54% vs 46%) and younger (53 versus 59 years). Māori and Pacific ethnicities had significantly higher non-attendance rates (21.37% and 16.90%, respectively) than NZ Europeans (5.27%). Higher deprivation scores increased the risk of non-attendance, OR=3.89 (95% CI 2.94-5.15; p<0.001) for decile 10 (most deprived) compared to decile 1 (least deprived). Non-attendance rates increased from 6.8% to 8.6% (p<.001) after the COVID-19 pandemic.
Conclusion: Non-attendance rates have increased since the pandemic, and it is unknown what consequences this will have on Māori and Pacific populations and those with higher deprivation scores, who are traditionally at greater risk of poorer health outcomes. Follow-up studies would be warranted to establish whether this is an ongoing trend in the following years.



Efficacy, safety and therapeutic drug monitoring of thioguanine in patients with Inflammatory Bowel Disease (IBD) in a New Zealand cohort

Ovenden C, Chou E, Anderson A, Barclay M
Te Whatu Ora Waitaha - Canterbury, Christchurch, New Zealand.

Background: Thioguanine (TG) is a thiopurine which has shown good efficacy and an acceptable safety profile in the treatment of patients with IBD in studies from the UK and the Netherlands. We aimed to replicate these findings in a cohort of IBD patients in New Zealand.
Methods: A retrospective single centre study was undertaken. Patients prescribed TG for IBD under the care of a gastroenterologist at Te Whatu Ora - Waitaha Canterbury were identified cross-checking a laboratory database of TPMT enzyme activity results and thiopurine metabolite concentrations with pharmacy dispensing data. Electronic health records were searched for efficacy and adverse reactions. Efficacy was defined as treatment interval without steroids, surgery, or escalation to a biologic.
Results: Of 144 patients identified, 63% had Crohn's disease and 35% UC. 141 had failed conventional thiopurines prior to starting TG. Median TG dose was 20mg/day (range 2.9-40). One year after starting treatment, 60% remained on TG. Of those prescribed thioguanine as concomitant immunosuppression while on a biologic, 50% were maintained without steroids or surgery. Of those not on biologic therapy, 38% came through the study period on thioguanine without escalation to steroids, a biologic or surgery. Adverse events were noted in 74 patients, many of which were mild or moderate, and many transient. One patient had severe pancytopenia from thioguanine therapy and recovered. Therapeutic drug monitoring showed that the median 6-TGN level was 724 pmol/8x10^8RBC (range <30 – 4169).

Conclusion: This cohort of IBD patients likely had relatively more severe and refractory IBD than cohorts in the Netherlands and UK. Thioguanine was effective in 38% of those not on biologic therapy when treatment was started, almost all of whom had failed conventional thiopurine therapy. ADRs were relatively common, minor and often transient.

Emergency endoscopy services, when do they alter outcomes? a retrospective review at North Shore Hospital

Liem M, **Macfarlane K,** Pushparajah L, Daker C
WDHB, Auckalnd, New Zealand.

Background: The British Society of Gastroenterology recommends acute hospitals have emergency endoscopic services (EES) for best clinical outcomes. Given the current climate and healthcare a finite resource with increased costs associated with EES, this retrospective study aims to examine the indications, outcomes and significance EES at North Shore Hospital.

Method: Data was retrospectively collected January 2021-January 2022 from clinical records. EES were defined as endoscopic procedures falling outside standard working hours. EES were deemed necessary to alter clinical outcomes in: Rockall score of>3, cholangitis (febrile despite antibiotics), post-procedural complications, haemodynamic instability, foreign body removal and decompression for volvulus. Data was analysed using SPSS statistics.

Results: 160 out-of-hour endoscopies were performed. 66.9% of procedures were oesophagogastroduodenoscopies. Upper gastrointestinal bleeding was the most common indication. 91.9% had pathology, 68.1% met criteria to alter clinical outcomes and utilise EES and 75% needed interventions. In the UGIB subset, there was a statistically significant relationship between Rockall's score (p=0.033) and the need for intervention.

Table 1. Frequency, significance and outcomes, by endoscopy indication.

Indication	Frequency n(%[a])	Significant Findings n(%[b])	Alter Immediate Outcomes n(%[b])	Intervention n(%[b])
UGIB	59(36.9)	50(84.7)	39(66.1)	35(84.1)
Foreign body	30(18.8)	28(93.3)	24(80)	24(80)
Cholangitis	13(8.1)	13(100)	8(61.5)	13(100)
Post-procedural complication	12(7.5)	11(91.7)	8(66.7)	10(83.3)
LGIB	10(6.3)	10(100)	5(50)	4(40)
Volvulus	10(6.3)	10(100)	10(100)	10(100)
Malignancy	6(3.8)	6(100)	4(66.7)	6(100)
Choledocholithiasis	5(3.1)	5(100)	2(40)	5(100)
Stent issue	5(3.1)	4(80)	2(40)	5(100)
Bowel obstruction	2(1.3)	2(100)	1(50)	2(100)
Other	8(5%)	8(100)	6(75)	6(75)

[a] %relative to total, [b] %relative to endoscopic indication

Conclusion: Significant pathology was found in 92%, 75% needed intervention and 68% met criteria in order to alter clinical outcomes. ERCP was the least likely to meet EES criteria whilst foreign body most likely. In the UGIB subset the Rockall score was statistically significant in predicting intervention. This is consistent with current literature promoting resuscitation over EES. A study limitation was not assessing declined referrals. Other variables such as length of stay and weekday versus weekend endoscopy could be calculated with this data complimenting the current climate and need for careful consideration of scarce resources.

Endoscopic full thickness resection of difficult to resect colorectal lesions. A single center retrospective study

Glassey E1, Ogra R
Counties Manukau DHB, Auckland, New Zealand.

Background: Colonic endoscopic full thickness resection (EFTR), using an over the scope device, is a useful technique in the resection of recurrent or residual adherent colonic adenomas, or of lesions in difficult locations – specifically the appendiceal orifice or small to medium size cancers deemed to be unsuitable for surgery. Previous studies have demonstrated higher rates of complete resection with clear histological margins using EFTR for these carefully selected lesions when compared with endoscopic mucosal resection (EMR).

Method: This was a single centre case series of 26 consecutive cases selected for EFTR. Cases were either of recurrence following prior EMR or new lesions considered unlikely to be fully resectable via EMR.

Results: EFTR was possible in 23 out of 26 planned cases. R0 resection was achieved in 17/23 of those completed cases (74%). There were 9 tubulovillous adenomas (35%), 6 adenocarcinoma (23%), 6 sessile serrated lesions (23%). Most common location was appendiceal orifice with 10 lesions (38%). 12 patients (46%) have undergone follow up endoscopy thus far, only 2 lesions so far have demonstrated disease recurrence. 2 patients (8%) required hospital admission relating to complications of procedure – these were both relating to appendiceal orifice resections. There was 0% mortality at 90 days.

Conclusion: This was a small case series in EFTR demonstrating high R0 resection rates in otherwise difficult to resect lesions. There were additionally low complication and low disease recurrence rate using this resection method.

Endoscopic submucosal dissection of advanced lesions within the gastrointestinal tract: a single endoscopist's experience

Fox T, Sekra A
Middlemore Gastroenterology Department, Auckland, New Zealand.

Background: Endoscopic submucosal dissection (ESD) is a specialised endoscopic technique in the treatment of large precancerous and early cancerous gastrointestinal lesions which can avoid the need for surgical resections. ESD is technically demanding, requiring additional training to achieve proficiency. The objective of this study was to assess

the learning curve and success rate of ESD in a single endoscopist's experience.
Methods: Over 3.5-year-period, 59 ESD procedures were performed. We reviewed patient demographics, en bloc and R0 resection rates, dissection times, histological diagnosis, and complications. These variables were compared between first 30 and last 29 patients to assess learning curve. The mean follow-up period was 12.5 months.
Results: There were 17 gastric lesions, 28 rectal, 2 oesophageal, and 12 colonic lesions attempted for ESD. Successful en bloc and R0 resection were achieved in 91.5% and 73% of cases respectively. Specimen size increased from an average diameter of 27mm to 37mm between 2 halves of the study. Dissection speed increased during this period from 22min/cm2 to 6min/cm2. There was no significant change in en bloc and R0 resection rates. Six perforations occurred, with all except one managed with an over-the-scope clip, avoiding surgery. One patient required low anterior resection after rectal perforation occurred. Nine patients needed admission following their procedure for observation. Histology results from this series included 14 adenocarcinomas, 3 neuroendocrine tumours, 1 GIST, 5 adenomas with high grade dysplasia, 24 adenomas with low grade dysplasia, 2 squamous cell carcinoma in situ and 10 other histological classifications.
Conclusion: Our study shows that there is a learning curve in ESD, with improvement in dissection speed and size of the lesions resected overtime. The majority of patients were able to have en bloc resection with comparable R0 resection rates.

Endoscopic-ultrasound Directed Trans-gastric Endoscopy (EDGE) in Roux-en-Y gastric bypass patients – First New Zealand cases series

Law D, Weilert F
Waikato Hospital, Hamilton, New Zealand.
Background: Roux-en-Y gastric bypass (RYGB) has become more prevalent with the rise in obesity globally. Approximately one third of patients will subsequently present with biliary disease requiring intervention. Endoscopic access in these patients is challenging due to the altered anatomy, limiting conventional ERCP to the upper gastro-intestinal tract and biliary system. Endoscopic ultrasound directed transgastric ERCP (EDGE) is a novel technique that allows direct access into the excluded stomach. This procedure has been shown to improve success rate, reduce operation time and shorten hospital stay when compared to enteroscopy or laparoscopy assisted ERCP. We describe our first cases of EDGE performed in our institution.
Methods: The cases of EDGE performed in Waikato Hospital were reviewed retrospectively. Outcomes including hospital stay and complications were reviewed via electronic clinical records.
Results: The two patients who underwent EDGE were a 60 year old female and a 62 years old male. The indications for the procedures were choledocholithiasis and an endoscopic mucosal resection of a duodenal polyp, respectively. Both procedures were performed in a two-step process. The first step involved the formation of a fistula to the excluded stomach by EUS-guided placement of a lumen apposing metal stent. Both patients returned after two weeks to allow the intended trans-luminal endoscopic intervention to be completed through the matured fistula. The first patient had a successful ERCP with sphincterotomy and stone clearance, while the second patient had an EMR, both discharged as day cases. No complications were encountered in either patient.
Conclusion: The EUS-guided platform provides feasible and successful access to the excluded stomach for endoscopic intervention to the upper gastrointestinal and biliary system in patients who have had RYGB. We believe this will provide safe access for patients needing acute and elective procedures.

Ensuring an eHealth system is suitable for young people with inflammatory bowel disease: clinician, patient and parent topics for inclusion

Pipicella J[1,2,3], Vernon-Roberts A[4], Dutt S[5], Giles E[6], Gearry R[7], Day A[4], Carter D[8], Connor S[1,2,3,9], Andrews J[3,10]
[1]University of New South Wales, Medicine (SWS Clinical School), Liverpool, Australia, [2]Ingham Institute for Applied Medical Research, Gastroenterology and Hepatology, Liverpool, Australia, [3]Crohn's Colitis Cure, Pyrmont, Australia, 4University of Otago Christchurch, Department of Paediatrics, Christchurch Central City, New Zealand, [5]University of Sydney, The Children's Hospital at Westmead Clinical School, Sydne,, Australia, [6]Monash University, Department of Paediatrics, Clayton, Australia, [7]University of Otago Christchurch, Department of Medicine, Christchurch Central City, New Zealand, [8]Stratos Technology Partners, Christchurch Central City, New Zealand, [9]Liverpool Hospital, Department of Gastroenterology and Hepatology, Liverpool, Australia, [10]Central Adelaide Local Health Network, Adelaide, Australia.
Background: 'CCCare', an inflammatory bowel disease (IBD)-specific clinical management system, is being upgraded to include paediatric functionality. Young people with IBD and their parents were consulted separately to clinicians on topics they felt should be included.
Methods: Surveys were advertised online by Australian and New Zealand consumer groups in Sep-Dec 2021. Young people with IBD (<18 years) and parents provided online consent and demographic data. Participants were asked to indicate their opinion as to whether clinician-suggested topics2 should be included (yes, maybe or no). Descriptive statistics were used. The study had ethics approval (H21/116, 2021/ETH11378) and was funded by The Helmsley Charitable Trust.
Results: Of the 32 young people, 56% were male, 66% had Crohn's disease (CD) and 63% were diagnosed 1-5 years ago. The greatest proportion of young people were aged "8-12 Years" (38%). Half (47%) were treated with "tablets, capsules, sachets or suppositories/enemas" only, and 72% rated their IBD control as ≥6 on a 1-10 scale (1=worst, 10=best). Of the 119 parents, 91% were female. Most (62%) were aged 41-50 years and their children were almost equally split in gender (male=55%). Most parents had children aged

"13-15 Years" (44%) and 73% had children with CD. There was general agreement (>70%) that Quality of Life, Mental Health, Self-Management Tasks and Transition Readiness topics should be included. Greater differences were seen in the General IBD Facts, Your IBD History and Satisfaction topics. Cost saw the greatest disparity, being less supported by young people and their parents/carers (<50%) compared to clinicians (76%).

Conclusion: Widespread consultation is useful in ensuring a clinical management system includes topics suitable to all consumers.

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Enteral Device Study Day- a Journey from insertion to discharge

Rowe C, Hussein A

Counties Manukau Health, Papatoetoe, New Zealand.

Background: Historically, the Gastroenterology Nurse Educator and Dietitians receive frequent calls from nursing staff with questions regarding enteral devices, principally for troubleshooting and patient education. These, at times, have unnecessarily delayed patient discharges and increased hospital length of stay. In response a course was created and offered to Registered Nurses at a Tertiary Hospital.

Methods: Incident reports were reviewed from 2018 to 2019 to identify the causes and common themes for delays in enteral device feeding, patient education, and discharge planning. The most common themes deduced were a general knowledge gap in gastrostomy tube care and maintenance. This consequentially inspired a proposal for a targeted course "Enteral Device Study Day".

Results: The 8-hour course has been held two to three times annually since 2018, with 120 Registered Nurses attending thus far. Of these attendees, 15% were from the Gastroenterology and Respiratory ward (Ward 32N). These are subspecialties that inherently have more patients with enteral devices, including post-elective gastrostomy insertions. Informal evaluation was collected from participants upon course completion via Survey Monkey, and a formal peer evaluation was completed in December 2020. Overall, feedback has been positive with a growing need to offer future courses more widely and frequently. Moreover, the number of incidents and ad hoc phone calls have anecdotally reduced since the course began.

Conclusion: The course provides a consistent teaching approach to empower nurses with current evidenced-based knowledge for their patients. Participant and peer feedback has been positive year-to-date. Subsequently, interest from Private Hospitals and Rest Homes has increased through word-of-mouth, and the course now offers reserved places for their staff to attend. Future projections is to hold a 4-hour condensed 'refresher' course for previous attendees and to Allied Health Professionals such as Dietitians or Clinical Pharmacists.

Enteric manifestation of Chronic Myelomonocytic Leukaemia (CMML) mimicking Crohn's disease

Wei H

Auckland City Hospital, Mission Bay, New Zealand.

We report the case of Mr L, a 75-year-old retired Tongan church minister who presented to hospital with relapsing-remitting fever, lower abdominal pain and haematochezia. CT showed terminal ileal thickening. Colonoscopy revealed severe terminal ileitis with ulceration, and biopsies showed non-specific chronic inflammation without granulomas. No features of vasculitis, ischemia, lymphoma, tuberculosis or Cytomegalovirus were identified. Stool cultures were negative on several occasions.

Over the following months, Mr L had numerous admissions to hospital with a marked inflammatory response, including fevers and hypotension, but no infection. A tentative diagnosis of Crohn's disease was made, but after three months of immunosuppressive therapy with steroids, Azathioprine and Infliximab, Mr L underwent laparoscopic ileocolic resection. Similar to earlier histology, non-specific inflammation and ulceration were seen in the surgical specimen, but there were no specific features of Crohn's disease. Mr L continued to have symptoms post-operatively and developed a leucoerythroblastic blood film. He underwent a buccal ulcer and bone marrow biopsy. Karyotyping identified trisomy chromosome 8 and next-generation sequencing demonstrated TET2, ZRSR2 and RUNX1 mutations consistent with a diagnosis of CMML. The buccal mucosal biopsy showed extramedullary infiltration by CMML. Within a few months of presentation, he had progressed to Acute Myeloid leukaemia and succumbed to illness.

CMML is a rare haematological malignancy that overlaps with MDS. The presence of trisomy 8 is associated with intermediate-risk disease. Gastrointestinal manifestations are exceptionally rare, with only a few cases reported in literature affecting the colon with presentations of bleeding, diarrhoea or colonic perforation1-3. Extra-medullary pathology is often non-specific, making diagnosis challenging. In 1962, Cornes et al. identified leukaemic gastrointestinal lesions in 14.8% of 264 leukaemia patients at autopsy, although it is uncertain what portion of cases were due to CMML4. There are no reported cases of CMML involving the small intestines to date.

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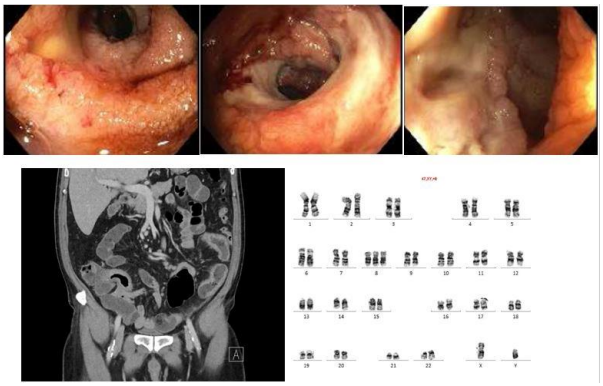

Equity of colonoscopy provision for Māori in Tairāwhiti

Bhula K, Stanley R, Memon S
Te Whatu Ora Tairāwhiti, Gisborne, New Zealand.

Background: Colonoscopy is an important diagnostic and therapeutic tool for the management of a number of GI pathologies including colorectal cancer. It facilitates removal of precancerous polyps and early diagnosis of colorectal cancer which is associated with a reduced incidence and improved survival, respectively. Maori are 30% more likely to die from colorectal cancer than non-Maori patients. We aimed to assess equity of access to colonoscopy for the population of Tairawhiti, where 53% of the population is of Maori ethnicity.

Methods: A retrospective analysis of a prospectively constructed database of patients undergoing colonoscopy at Gisborne Hospital between December 2016 and April 2021 was performed. The primary outcome was colonoscopy provision rates for Māori and non-Maori. Secondary outcomes included colonoscopy completion rate (CCR), colonoscopy withdrawal time (CWT) and adenoma detection rate (ADR).

Results: Over 52 months, a total of 2304 eligible colonoscopies were performed in 2093 participants. 623 were performed in Māori (27.0%) and 1681 were performed in non-Māori (73.0%). The colonoscopy provision rate in Māori over the age of 40 was 5.81% compared with 11.27% in non-Māori (P<0.001). Colonoscopy provision rates were also highly significantly different for all 10-year stratified age groups, except >90 year olds. ADR and CWT were similar between the two groups, however CCR was significantly lower in Māori (91.5% vs 95% P=0.001).

Conclusion: There is significant inequity in access to colonoscopy in Tairāwhiti. Further work is required to identify the barriers for Māori in accessing colonoscopy, to facilitate colonoscopy provision in this population.

Feasibility of using nutritional therapies preoperatively in adults with Crohn's disease

Wall C[1,2], Glyn T[1,2], Haines M[3], Rowbotham D[4], Bissett I[4,5], Eglinton T[1,2], Gearry R[1,2]
[1]University of Otago Christchurch, Christchurch, New Zealand, [2]Christchurch Hospital, Christchurch, New Zealand, [3]Waikato Hospital, Hamilton, New Zealand, [4]Auckland City Hospital, Auckland, New Zealand, [5]University of Auckland, Auckland, New Zealand.

Background: Preoperatively patients with Crohn's disease are at high risk of malnutrition. A low residue diet is often standard care preoperatively however, research suggests that preoperative exclusive enteral nutrition (EEN) improves nutritional status, reduces intestinal inflammation and consequently improves surgical outcomes. This research aimed to determine whether it is feasible to recruit and retain patients with Crohn's disease in a single-blinded, multicentre, randomised controlled trial of three preoperative nutritional therapies.

Methods: Patients for elective surgery to manage Crohn's disease at Christchurch, Auckland and Waikato hospitals, aged >18 years old, with body mass index (BMI) > 18.5 kg/m2 and without recent significant weight loss were eligible to participate. Patients were randomised to six weeks of preoperative EEN, partial enteral nutrition with Phase-1 Crohn's Disease Exclusion Diet (CDED) or standard care. Nutritional and radiological assessment at baseline and preoperatively was completed and surgical outcomes recorded. No statistical analysis was undertaken. Health and Disability Ethics Committee approval was given (20/NTB/134).

Results: Over 18 months, 48 patients were screened and 17 were randomised. Patient characteristics were: median age 37.9 (range, 28-68) years, 9 (53%) female, 10 (59%) on biologic medication, median BMI 25.7 (range, 19.7-38.6) kg/m2 and 2 (12%) had low fat-free mass index. Nutritional therapy was completed by 13/17 (76%) patients (EEN n=4, CDED n=4 and usual care n=5), BMI and simplified magnetic resonance index of activity (MARIA) score changed by a median of -0.3 (range, -1.8 to 2.1) kg/m2 and 0.5 (range, -3 to 2) points respectively. At day 30, 10 patients had no surgical complications and three had Clavien Dindo Grade 2 complications.

Conclusion: Patients who need elective Crohn's disease surgery tolerate preoperative EEN, CDED or usual care. Use of preoperative nutritional therapies are feasible and the impact on surgical outcomes should be assessed in a larger study.

First Aotearoa New Zealand case of NUDT15-variant-related thiopurine-induced myelotoxicity

Lee H[1], Ding S[2]
[1]Middlemore Hospital, Auckland, New Zealand, [2]Christchurch Hospital , Christchurch, New Zealand.

Background: Patients are commonly screened for thiopurine S-methyltransferase [TPMT] genetic polymorphisms prior to commencing thiopurines (Azathioprine [AZA], 6-Mercaptopurine, Tioguanine) to predict the risk of severe myelosuppression. Recently, genetic testing for polymorphisms in the enzyme nudix hydrolase 15 [NUDT15] has attracted interest as another predictor of severe

myelosuppression, especially in East Asian [EA] patients. We describe New Zealand's first case of NUDT15-variant-related thiopurine-induced severe myelotoxicity in a patient with ulcerative colitis

Case presentation: A 37-year-old Han Chinese man, with a history of ulcerative colitis with incomplete response to oral glucocorticoids, was commenced on AZA 200mg once a day. Pre-treatment TPMT levels were in the normal range. Eleven days later he developed symptoms of stomatitis and gingivitis. A full blood count five days post-onset of symptoms showed pancytopenia with an absolute neutrophil count of 0.0x10(9)/l. He was hospitalised, remained an inpatient for 17 days, and treated for infectious complications of herpes simplex stomatitis, oral candidiasis, dental abscess, and scalp abscess. He underwent NUDT15 genotyping and was found to have homozygosity for the variant NUDT15:c.415C>T.

Conclusion: Thiopurine-induced leucopaenia can be associated with significant morbidity, as evident in our patient who was a NUDT15 poor metaboliser. In addition to TPMT testing, we recommend all EA patients to have NUDT15 genotype testing prior to initiation of a thiopurine to estimate the risk of myelosuppression given 2% of the EA population are NUDT15 poor metabolisers and 20% are intermediate metabolisers1. In the Caucasian population where a loss of function allele frequency is less than 1%, NUDT15 testing should be considered in patients who develop myelosuppression1. Currently there is limited data in relation to the genotype and phenotype of NUDT15 polymorphisms in the Māori and Pacific Island populations and further studies in these ethnic groups would be beneficial.

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Functional dyspepsia is associated with retrograde gastric slow wave activity detected by a new body surface gastric mapping device

Al-kamyani M[1], Calder S[1,2], Varghese C[1], Schamberg G[2], Andrews C[3], Daker C[5], Waite S[2], Gharibans A[1,2,4], O'Grady G[1,2,4]

[1]Department of Surgery, Faculty of Medical and Health Science, The University of Auckland, Auckland, New Zealand, [2]Alimetry Ltd, Auckland, New Zealand, [3]Division of Gastroenterology, Cumming School of Medicine, University of Calgary, Calgary, Canada , [4]Auckland Bioengineering Institute, The University of Auckland, Auckland, New Zealand, [5]Department of Gastroenterology Waitemata District Health Board, , New Zealand.

Background: Insert text here Functional dyspepsia (FD) is a prevalent gastroduodenal disorder affecting up to 10% of the population and significantly impacting quality of life. The pathogenesis is poorly understood, limiting therapeutic progress. Putative mechanisms include gastroduodenal dysbiosis and immune activation, visceral hypersensitivity, and brain-gut dysregulation. Gastric dysmotility and electrophysiological disturbances have also been proposed, but reliable clinical methods to evaluate these abnormalities have been lacking. We developed a new medical device for non-invasively evaluating gastric dysfunction called body surface gastric mapping (BSGM), allowing novel biomarkers including wave propagation analysis, and applied it to assess FD. We aim to define gastric electrophysiological abnormalities and their symptom correlation in patients with FD, with comparison to matched healthy controls.

Methods: 25 patients with FD as defined by Rome IV criteria were matched by age, sex and BMI to 25 healthy controls. BSGM was performed using Gastric Alimetry (New Zealand), employing a high-resolution 64-channel electrode array, wearable Reader, and simultaneous symptom logging on a validated App. Participants underwent a 30-min baseline recording, followed by standardised meal (482kCal) and 4-hr postprandial recording. Data was analysed using the Gastric Alimetry processing pipeline.

Results: Patients with FD showed a substantially higher percentage of retrograde propagating gastric waves in the post-prandial period (median 16.70% (IQR 3.30 to 26.70) vs 30.00% (IQR 20.00 to 43.30) $p< 0.001$). In addition, retrograde slow wave propagation correlated with symptoms of excessive fullness, early satiety, bloating, heartburn, and pain, as well as the total Gastroparesis Cardinal Symptom Index (all $r>0.4$; $p<0.05$). Other BSGM biomarkers showed no difference between FD and controls, including gastric frequency (3.1±0.3 vs 3.0±0.2; p=0.77), amplitude (BMI adjusted; 38±15 vs 41±17; p=0.54), fasted:fed amplitude ratio (1.6±0.6 vs 2.0±0.9; p=0.14) or the 'Rhythm Stability Index' (0.46±0.18 vs 0.52±0.20; p=0.37).

Conclusion: BSGM allows detection of new biomarkers of gastric function including gastric wave propagation direction. FD patients show high rates of retrograde propagation, which correlates with symptoms. Additional studies are in progress to further define this new finding and its pathophysiological role in FD.

Gastric meal responses vary with BMI and sex as measured with Gastric Alimetry, a novel non-invasive medical device

Daker C, **Varghese C,** Schamberg G, Calder S, Xu W, Seo S, Carson D, Waite S, Woodhead J, Abell T, Parkman H, Andrews C, O'Grady G, Gharibans A

[1]Waitematā District, Auckland, New Zealand, [2]Alimetry, Auckland, New Zealand.

Background: Body surface gastric mapping (BSGM) is an emerging non-invasive medical technology for evaluating gastric electrophysiology and meal responses. BSGM offers novel and improved biomarkers of gastric function and a new modality for assessing stomach function. To identify the gastric meal response in healthy volunteers and evaluate the impact of body mass index (BMI) and sex.

Methods: The Gastric Alimetry™ System, comprising a stretchable-electronics high-resolution and wearable Reader, was used to perform BSGM in healthy controls. Continuous measurements encompassed a fasting baseline (30 min), 482 kCal meal (10 min), and 4-hr post-prandial recording with

simultaneous symptom-logging using the Gastric Alimetry App. Healthy volunteers were recruited and symptomatic subjects were excluded BSGM spectral metrics including the Principal Gastric Frequency, Gastric Alimetry Rhythm Index (GA-RI; a measure of the concentration of power in the gastric frequency band over time), BMI-adjusted amplitude (μV), and fed:fasted amplitude ratio (ff-AR) were calculated. Data reported as median (interquartile range (IQR)), and standardised regression coefficients.

Results: 110 subjects (55% female, median age 32 (IQR 24 - 50), median BMI 23.8 kg/m2 (IQR 21.4 - 26.9)) were included. Higher BMI (≥25 kg/m2) participants had accelerated meal-responses measured by time to peak postprandial amplitude compared to lower BMI (<25 kg/m2); median 2.12 h (IQR 0.98-2.72) vs 0.97 h (IQR 0.28-1.76); p=0.014). Females had significantly higher BMI-adjusted amplitudes [median 41.2 μV (IQR 31.7-51.9) vs 31.8 (IQR 26.0-444.4); p<0.01], and higher Principal Gastric Frequencies [median 3.08 cpm (IQR 2.90-3.10) vs 2.98 cpm (IQR 2.90-3.10; p=0.02]. BMI correlated with unadjusted amplitude (r=-0.55; p<0.001), unadjusted GA-RI (r=-0.34; p<0.001), and ff-AR (r=-0.22; p=0.02).

Conclusion: Novel influences of sex and BMI on gastric electrophysiology are reported, as measured by BSGM. Accelerated meal responses in obesity could be a contributory mechanism towards obesity. Gastric Alimetry offers a diagnostic approach to assess gastric function including in disease.

Gastroenterology and general medicine: matching trainees to the availability of consultant positions

Horsfall E, Boswell T
Taranaki District Health Board, Taranaki, New Zealand.

Background: New Zealand has a shortfall in gastroenterologist resource, with low full time equivalent (FTE) per population ratio. There is inequity in gastroenterologist workforce distribution across NZ, with regional areas particularly underserved. We aim to determine the distribution and clinical commitments of newly employed gastroenterologists in NZ, and the future intention of current gastroenterology trainees with respect to dual specialty gastroenterology and general medicine roles.

Methods: We conducted a survey of NZ Royal Australasian College of Physicians (RACP) gastroenterology Advanced Trainees (AT) between April-May 2022. Trainees were emailed a questionnaire about their training and future employment intentions. Official Information Act requests were made to each District Health Board (DHB) regarding new Gastroenterologist appointment and involvement in General Medicine over two years to 1st April 2022.

Results: Twenty-nine (100%) of gastroenterology ATs completed our survey. Two-thirds (73%) were male. Twenty-three (79%) were dual-training with general medicine, however only two (6%) were "very likely" to complete dual-training. The majority (75%) preferred to pursue a long-term career in a metropolitan center, with 52% reporting that inclusion of general medicine commitments would decrease their likelihood of applying for a position. Between 1st April 2020 – 1st April 2022, 29 gastroenterologists were employed in 12 of 20 DHBs. No gastroenterologists were employed in DHBs with a population of fewer than 100,000. Seventy-five percent were employed as sole gastroenterologists, the majority of FTE for dual gastroenterology/ general medicine physicians was in gastroenterology.

Conclusion: Current gastroenterology trainees express a preference to work as sole gastroenterologists, and in metropolitan areas. To promote regional gastroenterology workforce development, modification of selection criteria for gastroenterology training may be required. Positions in regional centers without general medicine commitments may be more likely to aid recruitment of current trainees.

Gastroenterology regional fellowship pilot at Taranaki hospital

Nagappan S, White C
Taranaki Hospital, New Plymouth, New Zealand.

Background: Gastroenterology regional fellow position was newly created to provide opportunities to sample working life as a Gastroenterologist in a regional centre. It also offers the opportunity as a stepping stone for a fellow to consolidate endoscopic and clinical skills in a supervised environment in preparation for independent consultant practise. The fellow's role included performing 3 independent endoscopic lists and 3 outpatient clinic sessions per week with further opportunities to attend weekly interventional list to gain further exposure to advanced endoscopy.

Methods: The regional fellow position was filled in February 2022. Data of 6 months pilot up to August 2022 was collected including number of endoscopic procedures performed, number of clinic patient seen and feedback on general experience.

Results: For initial 6 month period of fellowship, number of independent endoscopic procedures performed included 143 colonoscopies, 94 gastroscopies, 48 flexible sigmoidoscopies. Data on colonoscopy KPI's was regularly provided to fellow as feedback on performance. 254 clinic patients were seen including 126 new patient referrals and 128 follow-up patients. Good variety of gastroenterology presentations was seen. Cases were discussed as required with Gastroenterologists as part of mentorship. Fellow was involved in contributing to departmental teaching, presentations and working as a consultant in general medicine. Additional benefits observed included improved clinic waiting list of the service.

Conclusion: This initiative offers opportunities for senior trainee's to further consolidate clinical and endoscopic skills while getting a taste of life working in a regional centre and experiencing the potential work life balance it provides. It has the added benefit to the services itself. There were opportunities to combine work in general medicine and the job could be tailored to meet the needs/interest of the fellow. Further initiatives like this in could be helpful to further attract talents to the gastroenterology work force in provincial centres.

Gastroenterology study day

Rowe C, Riza H
Counties Manukau Health, Auckland, New Zealand.

Background: With the constant development and advances in specialists' care and advances within the interventional gastroenterology field, inpatient nurses were contacting senior gastroenterology staff for more education. The information requested was related to new interventional procedures and how inpatient nurses could provide detailed bedside patient focused education.
Methods: Courses available to nurses within the hospital were reviewed and there were no Gastroenterology courses available to nurses. As a result of this a focus group was created and a range of topics that are relevant to inpatient nurses were selected. An agenda was created, presenters contacted and a program was confirmed. The new course was socialized using a variety of communication methods (such as posters and emails).
Results: The COVID19 pandemic has impacted the number of study days being able to be facilitated. Two study days have been facilitated out of the three that were scheduled. Cancelation of the third course occurred due to COVID19 resource pressure. The course structure needed to be adapted to be delivered in an unpredicted environment. Course two was therefore delivered virtually via Zoom. A post course survey was sent to participants and data collected. 100% of responses felt that the objectives of the study day were clearly identified and met. All presented topics received either excellent or good reviews for topic delivery and content.
Conclusion: The data we have obtained has demonstrated that our course content and structure has provided inpatient nurses with the armamentarium required to provide excellent post procedure care and education to our patients. The success of this course has resulted in all remaining scheduled courses in 2022 to become booked to capacity well in advance. To keep up with demand, we have therefore increased the number future courses in 2023 to three sessions per year.

HCC surveillance with targeted liver ultrasound - a win win

Abdulhamid A, Chen A, Johns E, Higham L, Entwistle J
Ccdhb, wellington, New Zealand.
Background: Hepatocellular cancer (HCC) is the fourth leading cause of cancer-related death worldwide. Surveillance with 6 monthly ultrasound is endorsed by all major liver societies for patients at risk in order to diagnose HCC at earlier, and thus potentially curable stages of disease compared to those who present symptomatically. It was identified that the demand for ultrasonography resource exceeded capacity within our DHB. A collaboration between gastroenterology and radiology resulted in the development of HCC surveillance policy including the move to targeted liver ultrasound and standardised US LI-RADs reporting in mid-2021. Targeted liver ultrasound is a focussed assessment of the parenchyma of all lobes, portal vein and ligamentum teres. It provides a cost effective and standardised approach to meet the growing demand for HCC surveillance.
Methods: In this pre-post study, ultrasound requests for HCC surveillance were reviewed prior to and following introduction of the targeted liver ultrasound protocol in Capital and Coast District Health Board. Data was collected in February 2021; and July 2022 and outcomes calculated as point prevalence. Additional qualitative data was collected from senior sonographers and gastroenterology on the protocol and patient outcomes.
Results: The proportion of requests who were outside the 6 month surveillance window was 74.4% (201/270) pre-intervention vs 8% (23/283) post-intervention implementation of the targeted US protocol. Noted 8% requests outside the surveillance window were accounted for by lack of timely request or patient engagement. Opinion from radiology and gastroenterology was positive, with reduced examination time and satisfaction with resource use and patient outcome.
Discussion: The introduction of LiRADS reporting and the targeted liver ultrasound protocol was beneficial to our DHB. It has improved patient outcomes and radiology resource ultilization. Further analysis of patient engagement and physician requests is required, in addition to prospective data collection on patient outcomes including HCC detection rate.

Helpline activity in a high-volume inflammatory bowel disease centre

Harkess M[1], Arnold K[1], Leigh A[1], Doak K[1], Arnold M[1], Su H[1], Tharayil V[1], Gearry R[1,2]
[1]Department of Gastroenterology, Christchurch Hospital, Christchurch, New Zealand, [2]Department of Medicine, University of Otago, Christchurch, New Zealand.
Background: Inflammatory bowel disease (IBD) centres in New Zealand have helplines managed by nursing teams to support IBD patients. The helpline provides patients with timely access to specialist care and prevents hospital admissions. This also provides a pathway for general practitioners to access an IBD service. The aim of this study was to identify the helpline activity at a high-volume adult IBD centre.
Methods: Monthly data were captured prospectively for all patient contact between January to July 2022. The number of calls, text messages and emails were collated in a spreadsheet to provide a monthly report for IBD nursing encounters of service. In addition, a retrospective review was completed to identify reasons why patients accessed the helpline for advice.
Results: From January to July 2022, the IBD helpline received 833 patient contacts. Methods of contact were 562 telephone calls/texts and 261 emails including 10 contacts regarding adolescent patients under 17 years old. Reasons for contact were flare/illness advice 224 (26.8%), medication advice 106 (12.7%), prescriptions 68 (8%), covid advice 70 (8.4%), infusions 45 (5.4%), blood forms/results 81 (10%), special authority 35 (4.2%) and other 204 (24.4%), with medical input required in 142 (17%) cases. In addition to the helpline, the IBD nursing team also provided service to 160 patients in nurse led clinics and the hospital inpatient setting.
Conclusion: This is the first study to identify helpline activity from our centre and reinforces the importance of providing this service as standard of care. The helpline accounts for approximately 70% of the nursing role. Regular audit and review are crucial for clinical service planning to provide appropriate staffing for this specialist nursing service.

Hepatitis C virus sero-prevalence in defined populations in NZ: data from three GP practices

Tiong J[1], Upton A[2], Lockie A[3], Moore K[4], Stedman C[1,5]
[1]Department of Gastroenterology and Hepatology, Christchurch Hospital, New Zealand, [2]Southern Community Laboratories, Dunedin, New Zealand, [3]AbbVie Limited, Wellington, New Zealand, [4]Greenwood Health, Motueka, New Zealand, [5]University of Otago, Christchurch, New Zealand.

Background: New Zealand (NZ) lacks good epidemiological data on Hepatitis C Virus (HCV) infection. We performed a cross-sectional observational study to assess the HCV sero-prevalence data for defined regions in NZ.
Methods: Email or mobile phone text invitations were sent out to patients aged over 18 enrolled with three participating General Practitioner (GP) Practices in different parts of NZ. Patients who provided electronic informed consents were instructed to self-present for HCV blood tests. Email or text reminders were sent to those who gave consent but did not present for blood tests. Patients with positive HCV antibodies had reflex testing of HCV antigen and RNA viral load. These results were sent to their GP for further management. This study was approved by the Health and Disability Ethics Committee (approval reference: 20/NTB/261).
Results: 26,247 invitations were issued. 1,368 (5.2%) people gave informed consent, and of these, 1,021 patients (3.9%) presented for HCV blood tests. 8 out of 1,021 (0.78%) people tested positive for HCV antibodies, of which 2 (0.2%) had positive antigen and elevated RNA viral load, consistent with active infection. Of the other 6 patients with positive HCV antibodies, 2 had known past infection (0.2%), and 4 (0.4%) had no previous testing.
Conclusion: From 1021 adult patients who volunteered for HCV blood tests from 3 GP practices, the rate of positive HCV antibodies and active infection was 0.78% and 0.2%, respectively. However, the overall rate of participation is low. This may affect the representativeness of our samples but does give important information on the engagement of NZ people from different populations in a free HCV screening programme. The data will have implications for resource allocation and the possible implementation of an HCV screening programme.

Impact of green kiwifruit on colonic transit and fermentation profile in adults with chronic constipation

Maggo J[1], **Ng H[1],** Bayer S[1], Gearry R[1], Roy N[2]
[1]The University of Otago, Christchurch, Christchurch, New Zealand, [2]The University of Otago, Dunedin, Dunedin, New Zealand.

Background: In patients with chronic constipation, slow colonic transit is hypothesised to be associated with altered colonic fermentation profiles. Green kiwifruit (GrKF) are known to have laxative effects, potentially through impacts on the gut microbiota and its subsequent role in regulating colonic transit. SmartPill® measures gastrointestinal anatomical landmarks through changes in temperature and pH. In this study, we use the novel Atmo gas-sensing capsule to explore colonic fermentation profile in parallel to the validated SmartPill®.
Methods: A subset of participants with chronic constipation, randomised to either consume two Zespri® GrKF (Actinidia deliciosa 'Hayward', ~150g per serving, ~90 kcal) or calorie-matched maltodextrin (~90 kcal = 25g) daily for 4 weeks, were invited to ingest two wireless motility devices (WMDs) i.e. SmartPill® and Atmo gas-sensing capsule at baseline (B) and post intervention (PI). Participants consumed a standardised dinner and breakfast, ingested WMDs in random order, fasted six hours post ingestion, and wore data receivers until WMD excretion.
Results: Currently, data analysis is in progress. Of 29 participants invited to participate in the WMD sub study, 19 participants ingested at least one WMD; 35 SmartPill® (B;19, PI;16) and 25 Atmo gas-sensing capsule (B;16, PI;9) were ingested. Nine participants completed dual ingestion. Eight participants consumed GrKF and eleven maltodextrin. The complete data for all anatomical landmarks is available for 26 of 35 SmartPill®; and 16 of 25 Atmo gas-sensing capsule ingestions. One participant was unable to swallow any capsule and four X-ray investigations were performed to confirm capsule excretion.
Conclusion: This data will demonstrate the impact of habitual intake of two GrKFs on gut transit and colonic fermentation profile in adults with chronic constipation.

Impact of the introduction of a decompensated liver cirrhosis bundle at Tauranga Hospital

Graddon C[1], Oudes C[2], Kelly S[2]
[1]Waitemata DHB, New Zealand, [2]Bay of Plenty DHB, New Zealand.

Background: A 2013 report in the UK found substandard care for decompensated alcoholic cirrhosis patients admitted to hospital. Following this a Decompensated Cirrhosis Care Bundle was developed and was shown to improve management and outcomes of these patients. This bundle was published by the British Society of Gastroenterology. We aimed to implement a similar bundle and assess its impact on management for patients admitted to Tauranga Hospital.
Methods: Chart review of decompensated liver cirrhosis admissions at Tauranga Hospital before (April 2018 to December 2019) and after (June 2020 to June 2021) implementation of a Decompensated Cirrhosis Care Bundle.
Results: 91 admissions (50 pre-bundle and 41 post-bundle). 69% male, mean age 56.6, 72% NZ European/Pakeha, 47% alcoholic cirrhosis, 30% UGI bleed, median length of stay 6 days (0-31), 77% admitted by General Medicine. Median MELD 20 (8-37) and Child-Pugh C 10 (6-13). Bundle use increased after implementation (6% vs 44%,$p<0.05$), however, use diminished over time (50% use first six months, 35% second six months, $p=0.524$). There was improvement in completed ascitic tap (23% vs 47%, $p=0.088$) and trends towards improvement in VTE prophylaxis (15% vs 30%, $p=0.216$) and appropriate SBP management (0% vs 50% $p=0.33$) although alcohol history, those completing ≥ 6 of stated bundle blood tests, and appropriate management of encephalopathy, UGI bleed and AKI were similar. When comparing only cases where bundle was used after implementation to all cases before, there were statistically significant improvements in completion of ascitic taps (23% vs 100%, $p<0.05$), completion of all bundle stated blood tests

and radiology (4% vs 61% p<0.05) and alcohol history (78% vs 100%, p<0.05).
Conclusion: There were improvements in aspects of care after implementation of the bundle, particularly if the bundle was used. Diminishing bundle use over time should be targeted with repeated education sessions and re-audits.

Impact of type of colonoscope on patient and procedure outcomes: the long and short of it

Gosai K, **Patel R**
Te Whatu Ora Lakes, Rotorua, New Zealand.
Background: Colonoscopy can be performed using a standard adult colonoscope (12.8 mm insertion tube diameter, 1330 mm working length) or a paediatric long colonoscope (11.8 mm diameter, 1680mm working length). Endoscopist preference on type of colonoscope used is variable. We aimed to identify differences in outcomes based on the type of colonoscope used.
Methods: A retrospective study of all colonoscopy performed using 190 Series standard adult colonoscopes and paediatric long colonoscopes at a New Zealand based hospital. Data retrieved using Provation endoscopy software search (introduced in 2017). Analyses performed using chi-square and student t-test.
Results: 1713 colonoscopy procedures included.
Conclusion: Using a standard adult colonoscope has a shorter total procedure time than using a paediatric long colonoscope. There is a trend towards better comfort scores when a standard colonoscope is used. These results may be skewed by pre-selection of a narrower scope for therapeutic or technically difficult procedures.

Table 1. Patient and procedure outcomes based on type of colonoscope used.

	All colonoscopes n=1713	Standard colonoscope n= 1419	Paediatric long colonoscope n=294	p value
Age (years)	62	61.3	63	0.2
Gender (Female)	908 (53%)	744 (52%)	164 (56%)	0.3
Total Procedure time <30mins	908 (53%	774 (54%)	134 (46%)	*0.005
Comfort Score: Comfortable	1048 (61%)	882 (62%)	166 (56%)	0.07
Anaesthetist-assisted sedation	60 (3.5%)	44 (3.1%)	12 (4.1%)	0.4
Polyp Detection	684 (40%)	561 (40%)	123 (42%)	0.5

Improving innovation in healthcare using low-code/no-code development: Waikato hospitals acute electronic endoscopy triage and referral system, a tertiary hospital experience

Zheng E[1], Kerrison C[2], De Souza A[2], Johnston H[3], Wong J[4], Weilert F[2]
[1]Department of Internal Medicine, Te Whatu Ora Waikato, Hamilton, New Zealand, [2]Department of Gastroenterology, Te Whatu Ora Waikato, Hamilton, New Zealand, [3]Senior Support Analyst, CWS application development team, IS Department, Te Whatu Ora Waikato, Hamilton, New Zealand, [4]Department of Respiratory, Te Whatu Ora Waikato, Hamilton, New Zealand.
Background: Low-code/no-code (LCNC) applications are underutilised as clinician-built solutions for daily hospital-based tasks. Waikato Hospitals endoscopy unit on average receives 5-12 acute endoscopy requests per day. Prior to December 2021 all endoscopy referrals were made on handwritten paper and faxed. This created problems such as forms being lost, handwriting illegible, co-ordination and communication inefficient. Environmental sustainability was also a major concern regarding paper wastage.
Methods: We used Microsoft's Power Automate™ and Power Apps™ to develop a clinician-built triage and management system, which integrated with e-referrals for acute endoscopy from Clinical Work Station™ (Waikato Hospitals main health data system). Electronic referral system went live on 6th of December 2021.
Results: From December 2021 to August 2022, our clinician-built Power App™ had approximately 4500 visits with up to 44 unique users monthly. 1201 endoscopy referrals were made, 1007 (84%) endoscopies completed, 56 (5%) duplicate referrals, 17 (1%) triaged to outpatient endoscopy and 111 (10%) were declined or cancelled back to the referrer. 1177 (98%) referrals utilised electronic notifications between clinicians/nursing/administration, minimising the need for face-to-face contact and reducing paper waste, while optimising patient care and co-ordination. Prior to December 2021 there were 15 steps from the patient presenting to hospital to having their endoscopy completed, now the process is shortened to 7 steps. 10 endoscopy staff including 2 doctors and 6 nurses provided positive feedback during surveys.
Conclusion: The LCNC system we developed is clinician focused, modified for our needs and built on current Microsoft 365™ licencing, which does not incur extra costs to Waikato Hospital, and allows integration into Outlook™ and Teams™. In the short time our system has been online, it has demonstrated efficiency, sustainability, and safety for patient care with high levels of clinician satisfaction and potential to be integrated to other hospitals with similar Microsoft 365™ licencing.

Inflammatory Bowel Disease in Canterbury - An Analysis of 2000 Patients from Crohn's and Colitis Care

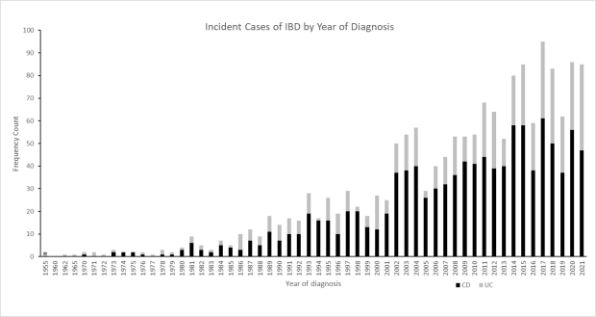
Forbes A[1], Day A[1,2], Gearry R[1,2]
[1]University of Otago, Canterbury, New Zealand, [2]Te Whatu Ora - Health New Zealand.
Background: New Zealand has high rates of Crohn's disease (CD) and ulcerative colitis (UC) making inflammatory bowel disease (IBD) a growing problem for the health system. By

understanding the characteristics of patients with IBD we are better able to target treatment and plan for their future health care.

Methods: Crohn's and Colitis Care (CCCare) is a patient management software used at Te Whatu Ora Health New Zealand to improve the care of patients with IBD and support research. In July 2022, we extracted demographic and disease information for the first 2000 adult patients from Canterbury and used descriptive statistics to summarise the cohort.

Results: 53% were female with a median age of 45 years. There was a predominance of CD (67%) over UC (31%). 14% of patients with CD and 5% with UC are current smokers, whereas the New Zealand population rate is 11%. The percentage of patients on biologic and immunomodulating medications also varied by disease with 14% of patients with CD on biologics and 18% on immunomodulators, for UC 6% were on biologics and 12% on immunomodulators.

Conclusion: CCCare supports the collection of data about patients with IBD in Canterbury. Our high proportion of CD may have economic implications as CD patients have higher annual average health costs, compared with UC patients. Smoking is associated with worse outcomes for patients with CD so there are opportunities to improve patient care.



Intestinal Ultrasound use at Wellington Hospital

Wynne A
Te Whatu Ora - Wellington And Hutt, Wellington, New Zealand.

Background: Intestinal Ultrasound (IUS) was introduced to Wellington Hospital eight months ago by a single gastroenterologist following two months of intensive training in Australia. We summarise its incorporation into clinical practice, contribution to management, especially in allowing point of care decision making.

Methods: Prospective data was recorded including diagnosis, context of study, indications, findings, and whether IUS results allowed same day management change. Correlation with relevant investigations (colonoscopy or CT/MR enterography) in the subsequent three months were later reviewed.

Results: 62 ultrasounds have been performed on 50 patients. 40 point of care scans were performed within routine allocated clinic times, and 22 were planned procedures within 20 minute slots. IUS has been used in assessment of patients with Crohn's Disease (55), Ulcerative Colitis (2), IBD-U (2), and to exclude a diagnosis of IBD (3). IUS was used to assist with diagnosis of IBD and disease distribution staging in 8 cases and in disease assessment in clinical context of remission (28), flare (18) and response to treatment (7). Serial scans were performed on 12 patients to monitor disease progress, including during pregnancy. IUS directly resulted in same day management changes in 19 cases, including starting (11), escalating (6) and stopping (2) treatment. IUS has a strong correlation (100%) in identifying presence or absence of clinically significant inflammation when compared to subsequent relevant investigations (13 cases).

Conclusion: In keeping with international experience, IUS at our centre has been a versatile and reliable tool. It has been easily incorporated into everyday practice and allowed for therapeutic changes to be implemented without time critical delays. Our findings support the use of IUS amongst training and established gastroenterologists in New Zealand and show that a short intensive training period can allow the introduction on an effective and quality service.

It is easy being green: implementing sustainable practice in endoscopy to reduce emissions in a rural hospital setting

Morgan S, Hill K, Penlington G, Jurawan R
Taranaki District Health Board, New Plymouth, New Zealand.

Background: Climate change is directly linked to health outcomes, with disproportionate impact on indigenous and low-medium human development index populations (1). Endoscopy services have been identified as one of the top three highest waste-generating departments (2). This project looks at three areas of endoscopy that can be modified to reduce carbon emissions and promote sustainability in a rural district general hospital in Aotearoa-New Zealand.

Methods: Three specific metrics were identified as modifiable; patient travel distances, procedure-associated landfill waste and paper use. Return travel distances were calculated using addresses accessed from patient records. Generated paper weight, total waste weight and recyclable waste weight were also measured. The data collected was converted to provide carbon emission figures across a week (16th – 22nd May 2022) using emission factors provided by the Aotearoa-New Zealand government (3). As a quality improvement project ethical approval was not required (4).

Results: For the week observed, a total of 4195.32 km were travelled to access endoscopy services, producing 1.125 tCO2e in emissions. It was calculated that having an additional endoscopy service in the region could reduce emissions by 45.2%. In the same period paper waste could be reduced by 88.1% if endoscopy reports were accessed electronically. During this studied week 58.6 kg (0.014 kgCO2e) of waste was produced, at least 11.3 kg of which was recyclable.

Conclusion: In a year the introduction of an additional peripheral endoscopy service could reduce emissions by 26.4 tCO2e (45.2%). This is comparable to the emissions produced by a single economy passenger flying 5 round trips from Auckland to Paris (5). With the number of endoscopy referrals rising in the next decade (6), there's an urgent need to maximise the benefits of a low-carbon system to secure the health of future generations.

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Laxative use is frequently associated with chronic diarrhoea in older adults living in care

O'brien L, Gearry R, Wilkinson T, Wall C
University of Otago, Christchurch, New Zealand.

Background: Chronic diarrhoea affects 5% of the population and can be due to several causes. Prevalence data for the most vulnerable older adults, those living in care, is sparse. This study investigated the prevalence of chronic diarrhoea in New Zealand residential care older adults and associations with medication use.

Methods: An observational study of New Zealand Ryman Healthcare facilities for three months in 2021 was conducted. It included bowel motion, anthropometric, medication and quality of life (QOL) data for 2410 older adults. Data were analysed using independent two-sample T-tests and chi-square tests. Prevalence of chronic diarrhoea was determined using the Rome IV criteria; at least 25% of bowels motions being type 6 and 7 on the Bristol stool chart.

Results: A quarter of residents experienced chronic diarrhoea (26%). Polypharmacy, defined as more than five medications daily, occurred more frequently in residents with diarrhoea (84%) compared to residents with a normal bowel state (48%) ($p < 0.001$). Laxatives were administered to 63% of residents with chronic diarrhoea, 37% of which were charted two or more different types, the most common being Laxsol. Residents experiencing diarrhoea and administered laxatives were more likely to have lower mood (18% vs 12%), be at risk of pressure injuries (13% vs 4%) and less likely to enjoy time with friends and family (62% vs 80%) than residents without diarrhoea (all $p < 0.001$). Comparing rest home residents only, who are likely more independent, the residents with diarrhoea taking laxatives continued to have lower QOL measures and were more likely to experience weight loss than those with normal bowel motions (46% vs 26% $p < 0.001$).

Conclusion: Chronic diarrhoea is prevalent in care facilities and is likely associated with laxative use. It is negatively associated with QOL, mood and pressure injury risk, irrespective of the level of care.

Linear IgA Bullous Disease presenting with new diagnosis of Ulcerative Colitis

Nagappan S, Jurawan R
Taranaki Base Hospital, New Plymouth, New Zealand.

Background: Liner IgA bullous disease (LABD) is a rare blistering autoimmune skin condition characterized by linear deposition of IgA at the dermoepidermal junction. It usually presents abruptly and manifest as tense bullae and inflammatory lesions of the skin. We present a case of LABD with concurrent new diagnosis of ulcerative colitis (UC).

Case report: A 19 year old gentleman presented to the emergency department with 10 days history of itchy, blistering rash involving his whole body. It had started as small vesicular rash which then progressed to blisters quickly. He also provided concurrent history of having intermittent episodes of per rectal bleeding with diarrhoea for the past 3 months. The skin lesions had a string of pearl configuration which is characteristic of LABD. Histology from punch biopsies taken from the lesions was consistent with diagnosis of LABD. He was commenced on oral prednisone with slow tapering down of dose. His rash improved dramatically and subsequently resolved. Stool investigations revealed an elevated faecal calprotectin of 2341. He subsequently had an outpatient colonoscopy which showed pancolitis with moderate inflammation. Biopsies would confirm new diagnosis of UC.

Discussion: LABD is a rare skin disease that can affect both children and adults. The gold standard for diagnosis is the detection of linear deposits of IgA with direct immunofluorescence microscopy. Prednisone and Dapsone form the cornerstone of treatment. UC appears to be the most common non-malignant condition linked to LABD with few case reports previously documenting this link. UC usually precedes the diagnosis of LABD.

Conclusion: This case reinforces the potential link between UC and LABD. It is useful for clinicians to be aware of this potential link especially in patients with UC who present with bullous skin disease. This case also highlights the possibility of both conditions presenting concurrently at the same time.

Management of acute food bolus obstruction in a large tertiary hospital over a 10 year period

Savant V, Lo S, Huang J, Matthew T
Middlemore Hospital, Auckland, New Zealand.

Background: Acute oesophageal obstruction is a common hospital presentation in adults that requires urgent management. This retrospective audit assessed management of food bolus obstruction in a large tertiary hospital; and reviewed if local guidelines met international standards.

Methods: Data of endoscopies and admissions from 2010 to 2019 with acute oesophageal obstruction were studied. Electronic records during this period were used to identify patient demographics, aetiology of obstruction, pre-gastroscopy medical therapy, time from presentation to endoscopy and extraction devices utilised. Length of

admission, complications that ensued and recurrence were also identified.
Results: During the 10 year period, there were 135 primary admissions with acute oesophageal obstruction: 122 were soft food bolus and 13 were foreign bodies. Median age was 53 (ranging from ages 17 to 91). Pre-endoscopy medical therapy was provided in 16.3% of cases. 1 admission was managed with pharyngoscopy and 134 with gastroscopies; 3 of which were done under general anaesthetic. Time to gastroscopy was variable depending on presentation with median time of 4hrs and 40mins (ranging from 15mins to 63hrs and 29mins). 20% of cases had no oesophageal obstruction identified. Eosinophilic oesophagitis was the most common aetiology reported in 27.4% of cases. Obstruction was noted equally within different segments of the oesophagus, but 9 cases had complete oesophageal involvement. 30.4% cases had extraction devises used. Amongst major complications identified, 2 developed aspiration and 1 had an oesophageal rupture with pneumomediastinum. 57.8% of cases were admitted for 1 or more nights, and 15.6% represented with a recurrence.
Conclusion: Majority of patients had therapeutic gastroscopy within the recommended timeframe. Contributory reasons for prolonged admissions were time of presentation to hospital and complications as a result of the oesophageal obstruction.

Mirror mirror on the wall, who's the quickest, cheapest, and most environmentally friendly of them all?

Clemente J, Melton A
Middlemore Hospital, Auckland, New Zealand.
Background: Transport to-and-from work is a huge consideration for those who are unable to 'work from home' and need to be 'on site' to perform their job. The ever increasing cost of petrol and the significant environmental impact of motor vehicles are key factors to assess and review. Endoscopy nurses are required to be physically present at work to perform their job. Transport options in Auckland include: private car (petrol/diesel/electric/hybrid), taxi/uber, train, bus, motorcycle, e-bicycle/bicycle, e-scooter/scooter, and walking. The aim was to investigate the quickest, cheapest and most environmentally friendly transportation for an endoscopy nurse working at Middlemore Hospital, Auckland.
Methods: Using a stopwatch, we will time the 13km journey to work and 13 km journey from work at Middlemore Hospital, for an endoscopy nurse living in Flat Bush. We will compare the travel modalities: private petrol car, bus, and e-bicycle, to determine the quickest, cheapest, and most environmentally friendly. We will record 10 journeys for each travel modality, specifically looking a travel during weekdays in peak congestion, and excluding the after-hours and on-call travel.
Conclusion: The car was reliable and convenient with an average journey time of 21 minutes. The bus was the cheapest, at a price of $1.10 one way with the current 50% discount incentive, but was the least reliable with one journey taking in excess of 1 hour, due to an unplanned cancellation. The e-bicycle was the most environmentally friendly method, but was not appealing in extreme weather.

Multidisciplinary group education for patients recently diagnosed with inflammatory bowel disease

Wall C[1,2], Arnold K[1], Harkess M[1], Tharayil V[1], Su H[1], Gearry R[1,2]
[1]Christchurch Hospital, Christchurch, New Zealand, [2]University of Otago, Christchurch, New Zealand.
Background: The prevalence of inflammatory bowel disease (IBD) in NZ is increasing and it is not always feasible to provide all patients a comprehensive one-to-one disease education session at diagnosis. The aim of this initiative was to trial a multidisciplinary group education opportunity to adult patients recently diagnosed with IBD in the Canterbury and West Coast region.
Methods: The session was designed to be delivered by an adult gastroenterologist, IBD nurse specialist and IBD dietitian with support from the Canterbury Crohn's and Colitis Support Group and covered information about the diseases, pharmaceutical and dietary treatments and self-management strategies. Patients recently diagnosed were invited by email to attend the session and completed electronic or paper satisfaction surveys scored from definitely no (0) to definitely yes (10) after the session. Ethical approval was not required for this quality improvement activity that was delivered as part of standard care.
Results: Two evening group education sessions have been held one via zoom during a COVID lock down and another face-to-face. Invitations to 46 patients were sent and 21 patients (median age 29 years, 12 (57%) female, 10 (48%) Crohn's disease, 13 (62%) NZ European) attended. Patients were highly satisfied with the multidisciplinary sessions (8.9/10.0), at the end of the session felt more confident to manage their IBD (7.7/10.0) and would recommend the session to others with IBD (9.6/10.0).
Conclusion: The sessions enabled patients unable to attend day-time appointments/sessions due to work, carer or travel reasons or who would not meet current referral criteria to access evidence-based information from IBD specialists. A group education model could be implemented nationally in collaboration with Crohn's and Colitis NZ. Increased patient access to evidence based IBD information may help to reduce regional inequalities in specialist access.

New Zealand adults with Inflammatory Bowel Disease exercise and diet (IBDeat) habits

Yap J[1], Wall C[2], Meredith-Jones K[1], Osborne H[1,3], Iosua E[4], Schultz M[1,3]
[1]University of Otago, Dunedin, New Zealand, [2]University of Otago, Christchurch, New Zealand, [3]Dunedin Public Hospital, Dunedin, New Zealand, [4]Biostatistic Centre, Dunedin, New Zealand.
Background: It is known that a healthy lifestyle is associated with lower risk of metabolic diseases. However, this may be challenging for people with inflammatory bowel disease

(IBD). This study aims to describe the nutritional status and lifestyle habits of adults with IBD in New Zealand (NZ).
Methods: A cross-sectional nationwide study was undertaken. Participants were recruited via social media and the Dunedin hospital IBD patient database. An online questionnaire collected demographics, disease severity scores, quality of life, physical activity, and dietary intake. A subset from Dunedin had anthropometrics, handgrip strength, blood pressure, body composition (bioelectrical impedance), blood nutritional markers, and faecal calprotectin measured. Descriptive analysis was conducted and data was compared to standard reference values. The study received University of Otago ethical approval (reference: H21/135).
Results: The questionnaire was completed by 168 adults, median age 39 (IQR 26, 51) of which 67% were female, 55% had Crohn's disease, 84% were NZ European and 4% were Māori. Most participants (65%) had quiescent-mild disease activity; median faecal calprotectin was 41.5µg/g (IQR 20.8, 142.5). Some participants reported comorbidities (33%), poor quality of life (38%), and 25% were active/ex-smokers. Most participants did not meet the recommended intake of fruit and vegetables (97%) and fibre (54%); furthermore, 69% reported avoiding high fibre foods (vegetable, fruits, wholegrains, nuts and seeds), dairy, and red meat. Fatigue, abdominal discomfort, and joint pain were reported as barriers to exercise by 57% of participants. In the Dunedin cohort (n=93), 66% had central adiposity, 67% had body mass index >25kg/m2, 45% had high body fat percentage, 26% had high blood pressure, 16% had impaired handgrip strength, and 79% had a raised LDL-cholesterol.
Conclusion: Findings suggest that NZ adults with IBD have multiple lifestyle risk factors for chronic metabolic diseases. Future studies should explore lifestyle interventions to mitigate these risk factors.

Non-invasive diagnosis of clinically significant portal hypertension can reduce the need for gastroscopy in patients with compensated cirrhosis

Willington A, McLaughlin J, Vente-Smith G, Southall J, Apeldoorn B, Tan D, Stedman C, Ngu J
Canterbury District Health Board, Christchurch, New Zealand.

Background: Clinically significant portal hypertension (CSPH) is the most important predictor of decompensation in cirrhosis (1). Gastroscopy has traditionally been used to identify varices needing treatment in patients at risk of CSPH, however it is invasive and fails to identify patients with CSPH but without varices, who also benefit from treatment with carvedilol (2). Recent Baveno VII consensus statements recommend Fibroscan and platelet measurements to identify CSPH (3). We retrospectively evaluated a sequential algorithm to identify what proportion of patients can avoid gastroscopy for diagnosis of CSPH.
Methods: Patients (n=273) undergoing gastroscopy to identify varices between 1/7/19 and 7/7/22 were screened. 102 patients were excluded, primarily due to current/previous decompensation or non-cirrhotic portal hypertension. Prior imaging, Fibroscan (within 3 years) and laboratory results were reviewed to determine patients' risk of CSPH.
Results: 171 patients were included. The distribution of liver disease was:

Aetiology	*n*
Hepatitis C	46
Alcohol	32
Obese NASH	28
Hepatitis B	7
Lean NASH	3
Other (including mixed aetiology)	55

33 patients had definite evidence of portal hypertension on prior imaging. 105 patients underwent Fibroscan, 79 within 3 years prior to gastroscopy (range 6.6kPa to 75kPa).
Patients without imaging evidence of portal hypertension were stratified according to Fibroscan and platelets (n=68):

Risk of CSPH	Fibroscan and platelets	*n* (excluding obese NASH)
Low (<10%)	≤15kPa and ≥150	12
High (>60%)	15-20kPa and <110; or 20-25kPa and <150	6
High (>90%)	≥25kPa	19

1 patient (methotrexate-induced cirrhosis) classified as <10% risk of CSPH had grade II oesophageal varices without high risk stigmata.
Conclusion: 79 (46%) patients screened for varices underwent Fibroscan within 3 years prior to gastroscopy. Of these 48 (59%) could be classified as low or high risk for CSPH and could have avoided gastroscopy. Application of Baveno VII recommendations to aetiologies other than viral hepatitis, alcohol and lean NASH may misclassify patients.
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Non-invasive scoring systems accurately identify patients with non-alcoholic fatty liver disease (NAFLD) with poor long-term outcomes

Swaminathan A[1,2], Brownson A[1], Frampton C[2], Gane E[1,3], Orr D[1]
[1]New Zealand Liver Transplant Unit, Auckland City Hospital, Auckland, New Zealand, [2]University of Otago, Christchurch, New Zealand, [3]University of Auckland, Auckland, New Zealand.

Background: Non-alcoholic fatty liver disease (NAFLD) is highly prevalent and associated with increasing healthcare utilisation. Non-invasive tests (NIT) predict advanced liver fibrosis and assist in triaging of patients to secondary care. This study prospectively assessed whether NIT predicted liver-related morbidity and mortality in patients with NAFLD.
Methods: Baseline NAFLD-fibrosis score (NFS) and Fibrosis-4 Index (FIB-4) were recorded in patients with NAFLD prospectively recruited (2002-2021) at a tertiary referral centre. Primary study endpoints were incident liver-related complications (composite of decompensated cirrhosis, hepatocellular carcinoma, liver transplantation, and liver-related mortality), extra-hepatic events (incident ischaemic heart disease and diabetes), and all-cause mortality. Cox's regression assessed associations of baseline variables with study endpoints. Multivariable models tested NIT thresholds (FIB-4 1.3 and 2.0; NFS -1.455 and 0.20) in predicting liver-related complications and death.
Results: In total, 487 patients were included; 187 female; median body mass index 32.3 kg/m2; median follow up 44 months (IQR 17-88). Liver-related complications (n=18) were independently associated with baseline NFS (adjusted hazard ratio(aHR)=2.17, 95% CI 1.51-3.13) and FIB-4 (aHR=1.88, 95% CI 1.50-2.35). All-cause mortality (n=27) was independently associated with baseline NFS (aHR=2.08, 95% CI 1.50-2.88) and FIB-4 (aHR=1.40, 95% CI 1.14-1.72). No NIT were associated with extra-hepatic events (n=49). Medium NIT thresholds (NFS 0.20, FIB-4 2.0) predicted liver-related complications (aHRNFS=10.70, 95% CI 2.68-42.74, Negative predictive value (NPV)NFS=0.99; aHRFIB-4=10.05, 95% CI 2.74-36.87, NPVFIB-4=0.99) and all-cause mortality (aHRNFS=6.71, 95% CI 2.28-19.71, NPVNFS=0.98; aHRFIB-4=5.51, 95% CI 1.91-15.88, NPVFIB-4=0.98). Low NIT thresholds (NFS -1.455, FIB-4 1.3) were not significantly associated with liver-related complications ($p>0.05$). Liver-related morbidity was observed in 1 patient (<2%) with intermediate NIT (NFS -1.455–0.20, FIB-4 1.3–2.0).
Conclusion: The NFS and FIB-4 accurately predict liver-related but not extra-hepatic complications associated with NAFLD. Higher NIT thresholds better predict liver-specific prognosis than those currently used in referral pathways from primary care to gastroenterology units.

Novel through-the-scope endoscopic tack and suture system for fistula closure – first case series in New Zealand

Dalkie N, Weilert F, Chin J
Waikato Dhb, Hamilton, New Zealand.
Background: Advanced endoscopic resection methods may result in large and irregular defects that can lead to bleeding or perforation. Such defects are challenging to close with standard through-the-scope (TTS) clips. Over-the-scope (OTS) clips inevitably require complete scope withdrawal for device assembly. Recent advent and approval for use of a novel TTS tack and suture system has allowed for closure of large gastrointestinal defects and fistulae using diagnostic gastroscope or colonoscope. We describe our initial experience and discuss indications for the use of TTS tack and suture device.
Methods: All patients in whom the TTS tack and suture device (X-Tack, Apollo Endosurgery, Austin, TX, USA) has been used at our institution were included in this case series.
Results: The X-Tack system has been utilised in two patients for attempted fistula closure.
Patient 1: Treatment of persistent gastro-cutaneous fistula following removal of gastrostomy tube which failed to close with OTS clip. Procedure undertaken with diagnostic gastroscope and pre-trement with APC prior to the use of X-Tack system. Closure achieved with good results initially. Unfortunately, fistula re-opened after 3 weeks. Patient proceeded to laparoscopic closure.
Patient 2: Closure of gastro-gastric fistula in a patient who underwent EUS-directed transgastric ERCP (EDGE) for proximal duodenal lesions in the setting of prior Roux-en-Y anatomy. After removal of the 20 mm lumen-apposing metal stent (LAMS), complete fistula closure was achieved with the X-Tack system to prevent weight regain.
Conclusion: The through-the-scope tack and suture system allows efficient closure of large gastrointestinal defects using standard endoscopes. Potential indications include large EMR/ESD defects, fistula/leaks and immediate closure of perforation.

Nurse Endoscopist to Nurse Practitioner - Why make the next leap?

Waylen T, Kempin K
Hauora A Toi Bay of Plenty, Tauranga, New Zealand.
Background: Why become a Nurse Practitioner (NP) in Endoscopy? Why train or employ a Nurse Practitioner in Endoscopy? New Zealand continues to have a shortage of gastroenterologists and Nurse Endoscopists are providing high quality endoscopy services but how can, and why should, you grow them to Nurse Practitioners performing Endoscopy?
Topics covered:
1- Requirements to become a Nurse Practitioner in Endoscopy.
• Difference between a Clinical Nurse Specialist (CNS) and a Nurse Practitioner performing endoscopy.
• Employment/remuneration considerations.
• What the role entails.
• Value of the Nurse Practitioner endoscopist.
• Expectations when becoming a Nurse Practitioner endoscopist
Conclusion: The Nurse Practitioner in Endoscopy role is in the very early stages of evolution, but we feel that combining these two roles gives personal and professional satisfaction and adds huge value to any health service willing to take them on.

Nurse led body surface gastric mapping service. An early single centre experience

Basco A, Santos N, Cederwall C
Wellington Regional Hospital, Newtown, New Zealand.

Background: Chronic nausea and vomiting rates are increasing and pose diagnostic and management challenges to treating clinicians due to diagnostic limitations and uncertainty. Gastric Alimetry is a novel non-invasive modality measuring gastric myoelectrical activity through body surface gastric mapping. We set up a public based nurse led gastric mapping service aimed at understanding underlying gastric pathophysiology and guiding subsequent treatment.

Methods: Four endoscopy nurses and a Gastroenterologist completed an online course followed by a hands-on demonstration and supervised cases from the Alimetry team. Gastric mapping studies were subsequently acquired by nurses within our endoscopy recovery. An adhesive electrode array was placed on patients' abdomen and connected to an array to record myoelectrical signals. Patients were provided a standardised meal and logged their symptoms on an iPad based App. A report was generated by the Gastroenterologist categorising patients to various disease phenotypes. A retrospective review of data from November 2021 to July 2022 collected patient demographics and diagnosis.

Results: 22 patients from 5 DHB's were tested for nausea and vomiting. 86% were Female and average age was 31 years. 23% had Ehlers-Danlos Syndrome and 27% had received parenteral nutrition. 86% had previously had a gastric emptying performed. The most common diagnosis was visceral hypersensitivity (63.6%) with treatment directed towards neuromodulation therapy. 18.2% of patients demonstrated Neuromuscular dysfunction and were treated with prokinetic therapy. 50% of patients had either neuromuscular dysfunction or a low gastric EMG amplitude. All studies were completed without complications.

Conclusion: We have demonstrated a nurse led gastric electrical mapping service can easily function within a public endoscopy unit. Gastric Alimetry allows a better understanding of pathophysiology in patients with chronic nausea and vomiting and directs appropriate therapy/ intervention. More cases/ long term treatment outcomes are required.

Nutritional therapies for adults with Crohn's disease in a hospital outpatient clinic

Wall C[1,2], Crowder T[2]
[1]University of Otago Christchurch, Christchurch, New Zealand, [2]Christchurch Hospital, Christchurch, New Zealand.

Background: Medications to treat Crohn's disease in New Zealand are limited. Exclusive enteral nutrition (EEN) is an established and effective treatment for active Crohn's disease. Recent evidence suggests that the Crohn's Disease Exclusion Diet (CDED) is also effective but is not yet widely used in New Zealand. Nutritional therapies reportedly induce disease remission in patients on maximal medical therapy. The aim was to pilot at Christchurch Hospital a new dietetic service that offers all evidence-based Crohn's disease nutritional therapies with a view to reducing escalation of medical or surgery treatments.

Methods: Adults with active Crohn's disease were referred to an expert inflammatory bowel disease dietitian for nutritional therapy. Patients were offered six weeks of either partial enteral nutrition with Phase-1 CDED or EEN followed by six weeks of Phase-2 CDED. Treatment response was defined as symptom improvement without escalation in medical or surgical treatment. No ethical approval was required.

Results: Over four months, 13 patients (seven males) aged 17 – 73 years old either on maximum medical therapy (n=8) or medication hesitant (n=2) or newly diagnosed (n=1) were referred. Patients chose to use EEN (n=7) or CDED (n=6). Five patients did not respond/comply with the treatment and had surgery (n=1) or medical therapy was escalated (n=4). Response occurred in 8/13 (62%) patients. Patients were highly satisfied with the dietetic service and found Phase-2 CDED acceptable.

Conclusion: Nutritional therapies were acceptable to patients, induced remission in two thirds of patients and reduced the need for escalation of medical therapy or progression to surgery.

Outcome of over-the-scope clip use for non-variceal upper gastrointestinal bleeding

Law D, Clark H, Weilert F, Dalkie N, Brooker J
Waikato Hospital, Hamilton, New Zealand.

Background: Endoscopic therapy is a key component to achieving haemostasis in upper gastrointestinal bleeding (UGIB). There is growing evidence that over-the-scope clip (OTSC) can be used as primary endoscopic treatment for UGIB. Recent studies have shown reduced rebleeding rate and improved clinical success rate with OTSCs compared with standard therapy for the treatment of non-variceal UGIB (NVUGIB). We reviewed the outcome of OTSCs as treatment for NVUGIB in Waikato Hospital.

Methods: Gastroscopies with the use of OTSCs from January 2019 to July 2022 were captured from Provation. OTSCs used for reasons other than NVUGIB were excluded. Pre-treatment factors and post-therapy outcomes were reviewed through electronic clinical records.

Results: 51 cases of OTSCs used for NVUGIB were identified. 49 (96.1%) were for peptic ulcers, with a mean ulcer size of 12.3 mm. 28 cases (55.0%) were on antithrombotic agents and 26 (51.0%) had active bleeding during endoscopy. OTSCs were used as the primary haemostatic therapy for 42 (82.4%) procedures. Haemostasis was achieved in 45 (88.2%) cases after OTSC deployment. Of the six procedures that failed to achieve immediate haemostasis, two had technical failure. There were 12 events of rebleeding, four required further endoscopic intervention, four underwent embolisation and one required surgery. A total of eight deaths were seen (15.7%), all of which had multiple co-morbidities, and six of these due to uncontrolled bleeding. No adverse outcomes were directly attributable to the use of an OTSC.

Conclusion: This study showed OTSCs are an effective treatment option for high risk NVUGIB, and supports its use as a primary treatment modality. Haemostasis and rebleeding rates were comparable to international reports. These findings, combined with recent meta-analysis showing

reduced procedure time compared to standard treatment, demonstrate the potential of OTSCs to improve efficiency in NVUGIB treatment.

Oxidative modifications of calprotectin in inflammatory bowel disease

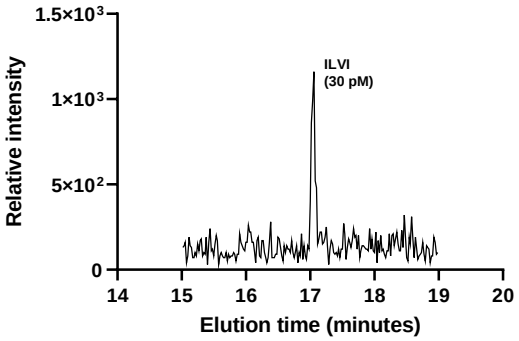
Borichevsky G, Magon N, Swaminathan A, Edwards T, Day A, Hampton M, Gearry R, Kettle A
University of Otago Christchurch, Christchurch, New Zealand.

Background: An influx of neutrophils to the intestinal mucosa is associated with inflammatory bowel disease (IBD). Calprotectin, a major neutrophil protein, is commonly used as a biomarker of IBD activity. Despite this, our understanding of the role neutrophils play in IBD is incomplete. One ongoing question is whether neutrophils contribute to inflammatory damage in IBD through production of reactive oxidants and release of proteases. To investigate this, we looked in IBD samples for modifications of calprotectin that are caused by neutrophil derived oxidants.

Methods: Plasma and faecal samples were obtained from patients with IBD that had been endoscopically assessed for disease severity. Western blotting against calprotectin was performed on faecal samples from these patients to identify oxidative cross-links of calprotectin. Using mass-spectrometry, we defined characteristic calprotectin peptides that formed after exposure to neutrophil-derived oxidants and proteases. We then searched for these peptides in plasma and faecal samples from IBD patients.

Results: We have found oxidative cross-links of calprotectin present in faecal samples from patients with active IBD. We have identified multiple calprotectin peptides including ILVI in both plasma (Figure 1) and faecal samples from patients with active IBD.

Conclusion: The presence of oxidative cross-links of calprotectin and calprotectin peptides in IBD samples strongly suggests that neutrophils cause oxidative damage in IBD. Further work is underway to explore the implications these oxidative modifications may have on the function of calprotectin.



Paediatric endoscopy in aotearoa New Zealand – EGGNZ Survey

Bishop J, Walmsley R
Starship Child Health, Grafton, New Zealand.

Background: EGGNZ aims to support the quality of endoscopy services across Aotearoa NZ. There are only small numbers of practitioners from paediatric surgical and gastroenterology specialties to provide dedicated paediatric endoscopy services nationally. Consequently many paediatric endoscopic procedures are performed by practitioners without specific paediatric training and/or in facilities which are not dedicated paediatric units. This EGGNZ study collected data on national paediatric endoscopy provision in order to assess quality of care and identify need pertaining to service delivery and training.

Methods: An on-line questionnaire was sent to members of the NZ Association of General Surgeons, NZ Society of Gastroenterology, Paediatric Surgeons and Paediatric Gastroenterologists. The survey collected data on practitioners; scope of practice; appropriateness of facilities; and access to support services, including paediatric anaesthesia.

Results: 46 responses were received, of whom 37 (80.4%) performed paediatric endoscopy. 21 endoscopists practised in public hospitals across ten DHBs and 16 in private facilities across seven DHBs. Practitioners comprised adult gastroenterology (57%), paediatric gastroenterology (26%), paediatric surgery (14%) and adult surgery (4%). Over half of practitioners (54%) had received no specific paediatric training. 46% of practitioners performed diagnostic endoscopy on any age children. Therapeutic endoscopy was performed by a substantial minority of endoscopists (46% for polypectomy; 36% for ingested foreign bodies; 36% for variceal management; 32% for stricture dilatation). Numbers of paediatric procedures varied significantly, with 32% performing ≤5 upper endoscopies and 43% ≤5 colonoscopies annually. Half of practitioners provided endoscopy in an adult facility. Only 48% had access to dedicated paediatric anaesthesia.

Conclusion: Our study highlights wide variability in provision of paediatric endoscopy nationally. These data raise questions about the child-centred nature of current practice and highlight the need for further audit/review of service delivery and a probable need for additional support and training.

Patient perspectives on hospital versus community infliximab infusions for inflammatory bowel disease

Quin N, Fulforth J
Waikato District Health Board, Hamilton 3024, New Zealand.

Background: Infliximab infusions for inflammatory bowel disease (IBD) patients at Waikato District Health Board are delivered centrally in Hamilton at Waikato Hospital. This study aimed to explore patient perspectives on receiving community-based infusions instead.

Methods: A questionnaire was administered to patients receiving their infliximab, between November 2021 and July 2022. Questions consisted of demographics, barriers faced,

and opinions on hospital versus community infusions. Clinical details were taken from the electronic medical record. Fisher's Exact test was used to assess categorical variables. Approval was gained from the local research and Maaori committees however did not require ethics approval.
Results: 60 patients were included. 33 (55%) male, median age 36.5 years (IQR = 30-47.5). 49 (81.7%) were Paakehaa, 4 (6.7%) Maaori, and 7 (11.7%) other. 32 (53%) had Crohn's disease, 27 (45%) ulcerative colitis, and 1 (5.5%) IBD unclassified. 23 (38.3%) patients travelled from outside of Hamilton city, with 21 (35%) travelling >30min one-way. 9/21 of these patients live closer to a peripheral hospital than to Waikato Hospital. Those travelling >30min were significantly more likely to be in favour of community infusions than those travelling <30min (16/21, (76.2%) v 6/39, (15.4%), $p<0.05$). Barriers to attending for infusions included: parking issues (61.7%); travel cost (36.7%); difficulty taking work leave (31.7%), and childcare (18.3%).
35 (58.3%) patients responded that they would be comfortable receiving infusions in the community. Conversely, only 6 (10%) responded that they would be uncomfortable with this.
Conclusion: There is support amongst this cohort for community-based infusions, particularly amongst those living more rurally. A centrally delivered service creates barriers, and may drive inequities. A community infusion service could help address these, with many patients who would benefit from a service at peripheral hospitals or in local clinics.

Performance of digital single operator cholangioscopy directed-electrohydraulic lithotripsy in the management of retained common bile duct stones

Weilert F, Chin J
Te Whatu Ora Waikato, Hamilton, New Zealand.
Background: The standard of care for bile duct stones (BDS) is endoscopic retrograde cholangiopancreatography (ERCP). However, in 10-15% of patients, the BDS cannot be removed by standard removal techniques including sphincterotomy with or without balloon sphincteroplasty and stone extraction using balloon or basket retrieval. Therefore, direct cholangioscopy with intra-ductal lithotripsy has been developed to allow clearance of retained BDS. We describe our experience with single operator cholangioscopy (SOC) and electrohydraulic lithotripsy (EHL) to achieve clearance of BDS after failed ERCP.
Methods: This is a retrospective review of a prospectively collected dataset between July 2015- July 2022 of consecutive patients undergoing ERCP and SOC with or without EHL for failed BDS clearance after ERCP. Review of electronic medical records documenting technical and clinical success of bile duct clearance, adverse events and 30-day re-admission.
Results: Performed 107 procedures on 84 patients (36 male:48 female, mean age 61.5 years, range 12-93 years). Complete clearance was achieved in 64/78 (82%) patients in single procedure, while 17/78 (20%) patient required >1 procedure. Overall complete clearance was achieved in 78/81 (96.3%) patients with 3 failures (3.7%) after >2 procedures. Another 3 patients are re-booked for completion. EHL was required in 76/107 (71%) while balloon extraction was sufficient to achieve stone clearance in 22/107 (20.5%) after adequate balloon sphincteroplasty. Adverse events occurred in 5/107 (4.7%) procedures with 2 patients experiencing sphincteroplasty associated bile duct injury and 3 patients developing post-procedure sepsis (cholangitis in 2 and localized collection in 1 patient who was re-admitted). Technical failure of bile duct access only occurred in 1 procedure.
Conclusion: Single operator cholangioscopy directed-electrohydraulic lithotripsy and stone extraction techniques achieve complete bile duct stone clearance in >95% of patients with failed conventional ERCP based techniques. Surgical bile duct exploration was necessary only in those with failed clearance associated with >2 procedures due to excessive stone burden.

Plasma myeloperoxidase is a potential biomarker of endoscopically active inflammatory bowel disease

Hou D[1], Swaminathan A[1], Borichevsky G[2], Kettle T[2], Gearry R[1]
[1]Department of Medicine, University of Otago, Christchurch, New Zealand, [2]Centre for Free Radical Research, Department of Pathology and Biomedical Science, Christchurch, New Zealand.
Background: Faecal myeloperoxidase (fMPO) and faecal calprotectin (fCal) are accurate neutrophil-derived biomarkers of inflammatory bowel disease (IBD) activity. The inconvenience of faecal sampling may be a barrier to testing. We investigated the utility of plasma MPO (pMPO) and calprotectin (pCal) as markers of endoscopic activity in IBD.
Methods: Prospectively recruited participants with IBD undergoing ileocolonoscopy for disease assessment provided biological samples prior to colonoscopy (Ethics reference 18/NTA/197). ELISA measured pMPO and pCal, and were compared with fMPO, fCal and endoscopic indices (simple endoscopic score for Crohn's disease (CD), SES-CD; ulcerative colitis (UC) endoscopic index of severity, UCEIS). The Mann-Whitney U test compared pMPO and pCal concentrations between active and inactive disease. Area-under the receiver operating characteristics curve (AUROC) and univariable logistic regression assessed the utility of plasma biomarkers in predicting active IBD.
Results: 170 participants were included (92 female, 99 with CD). pCal and pMPO were significantly associated with SES-CD (rpCal=0.33, $p<0.01$; rpMPO=0.23, $p<0.05$) and UCEIS (rpCal=0.37, $p<0.01$; rpMPO=0.47, $p<0.001$). pCal was significantly associated with fCal in CD (r=0.28, $p<0.01$) and UC (r=0.25, p=0.04). pMPO was significantly associated with fMPO in UC (r=0.35, $p<0.01$) but not CD (r=0.16, p=0.11). Median pCal (1286.06 ng/ml vs. 975.05 ng/ml, $p<0.05$) and pMPO (16.38 ng/ml vs 9.73 ng/ml, $p<0.01$) were significantly

higher in active versus inactive UC but not CD (p>0.05). Plasma biomarkers more accurately predicted active UC (AUROCpCal=0.66, p=0.02; AUROCpMPO=0.76, p<0.001) than CD (AUROCpCal=0.65, p=0.02; AUROCpMPO=0.62, p=0.07). pMPO >13 ng/ml (Odds ratio (OR)=3.33, 1.67-6.60) and pCal >1043 ng/ml (OR=2, 1.03-3.9) were associated with an increased risk of endoscopically active disease.

Conclusion: pMPO and pCal are promising potential biomarkers of IBD activity, especially in UC. pMPO had superior performance at predicting active UC compared with pCal. Plasma biomarkers should be further examined for their use in monitoring treatment response.

Post-ERCP pancreatitis prophylaxis at Auckland City Hospital, experience from a large tertiary referral centre

Southwell T, Myint H
Auckland City Hospital, Auckland, New Zealand.

Background: Endoscopic retrograde cholangiopancreatography (ERCP) is a common modality for investigating biliary tree pathology. Post-ERCP pancreatitis (PEP) is an important complication with internationally estimated incidence ranging from 3-10%. Severity is typically mild-moderate, with incidence of 5.7%, 2.6% and 0.5% of mild, moderate and severe disease respectively. The overall mortality ranges from 0.1-0.7% (1).

Prevention of PEP remains an important topic of endoscopic research, with several guidelines recommending PEP prophylaxis including rectal NSAID use, and more controversially intravenous (IV) lactated ringers (2, 3).

Auckland City Hospital (ACH) is a high volume ERCP centre. The aim of this audit was to review the PEP rate at ACH, and the use of PEP prophylaxis.

Methods: Single centre retrospective review of all ERCP conducted at ACH from August 2019 to August 2020. Baseline characteristics and PEP prophylaxis use (rectal NSAID and periprocedural IV lactated ringers) was collected. Diagnosis and severity of pancreatitis was based on the revised Atlanta classification (4).

Results: A total of 408 ERCP were completed during this period. 30 cases of PEP were identified (23 confirmed, and 7 likely) giving a PEP rate of 5.6%-7.4%. Broken down by severity there were 24 mild (5.9%), 5 moderate (1.2%) and 1 severe (0.3%) case(s). There was 1 PEP death (0.2%).

Analysis of PEP prophylaxis use showed 41% of patents received periprocedural lactated ringers (average volume 1.8L), and 44% received rectal NSAID. In those who subsequently developed pancreatitis, 84% had received NSAID and periprocedural hydration.

Conclusion: PEP rates at ACH are comparable to internationally published data, with a favourable mortality rate. Routine use of rectal NSAID and periprocedural hydration was lower than expected, but with higher use among high risk patients. ACH may benefit from a standardised post-ERCP algorithm to increase PEP prophylaxis.

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Power-controlled, irrigated gastric radio-frequency ablation settings provide potential pathway towards minimally-invasive application

Matthee A[1], Aghababaie Z[1], Sands G[1], Angeli-Gordon T[1,2]
[1]Auckland Bioengineering Institute, University of Auckland, Auckland, New Zealand, [2]Department of Surgery, Faculty of Medicine and Health Sciences, University of Auckland, Auckland, New Zealand

Background: Bioelectrical 'slow waves' coordinate gastric motility. Abnormal slow wave activation is associated with gastrointestinal disorders and provides a novel therapeutic target. Gastric radio-frequency ablation (RFA) has been shown to block conduction from abnormal gastric pacemaking sites, but has so far only been used via invasive open-abdomen surgery with temperature-controlled, non-irrigated settings. We hypothesise that power-controlled RFA with irrigation delivers results that can advance the development of minimally-invasive endoscopic RFA from the mucosal surface.

Methods: Ethical approval was granted by the University of Auckland's Animal Ethics Committee. Stomachs of anaesthetised weaner pigs were exposed through midline laparotomy, then RFA was performed as either (a) a grid of spot lesions using seven different power-controlled, irrigated settings (10-30W, 2-5 mL/min), and one temperature-controlled setting as a control (65□C) (n=5 pigs; n=4 points/setting; 10 s/point) or (b) a series of overlapping points (n=5 pigs; n=10 points; 10 s/point) to create a linear lesion using three power-controlled, irrigated settings (10-15W, 2-5 mL/min). Lesion size was quantified, and high-resolution electrical mapping was applied to verify potential conduction block.

Results: Spot lesions generated by RFA at 10W and either irrigation rate resulted in a similar lesion size to the established temperature-controlled setting (P>0.79). Forming a linear lesion at 10W resulted in conduction block while surface damage was reduced compared to the temperature-controlled setting. Further histological analysis quantifying tissue damage is underway.

Conclusion: This study demonstrates that power-controlled, irrigated settings of gastric RFA are effective in producing a

conduction block in the in vivo stomach, while also protecting the tissue surface in contact with the ablation catheter better than previous temperature-controlled, non-irrigated settings. These data will help inform and advance the translation of gastric RFA to an effective minimally-invasive procedure in the future.

Preclinical validation of non-invasive body-surface gastric mapping for detecting gastric slow wave features by simultaneous high-resolution serosal mapping

Calder S[1,3], Cheng L[1], Andrews C[3,4], Paskaranandavadivel N1, Waite S3, Alighaleh S[3], Erickson J[2], Gharibans A[1,3], O'Grady G[1,3], Du P[1,3]
[1]University of Auckland, Auckland, New Zealand, [2]Washington and Lee University, Lexington, United States, [3]Alimetry Ltd, Auckland, New Zealand, [4]University of Calgary, Calgary, Canada.

Background: Reliable non-invasive tools to objectively assess gastric function are lacking. Body-surface gastric mapping (BSGM) is a non-invasive method for the detection of gastric electrophysiological features, which have correlated with symptoms in patients with gastroparesis and functional dyspepsia. The aim of this study was to comprehensively evaluate the basis of BSGM from 64 cutaneous channels and reliably identify spatial biomarkers associated with slow wave dysrhythmias.
Methods: High-resolution electrode arrays were placed to simultaneously capture slow waves from the gastric serosa (32×6 electrodes at 4 mm spacing) and epigastrium (8×8 at 20 mm spacing, Gastric Alimetry) in porcine subjects (N=14). BSGM signals were processed based on a combination of wavelet and phase information analyses, and then assessed in terms of frequency and propagation features (antegrade vs non-antegrade) to the ground-truth slow wave recordings from the stomach. The accuracy of the BSGM characterization was classified on a cycle-by-cycle basis as true positive, false positive or false negative and quantified in terms of F-measure (accuracy).
Results: A total of 1185 individual cycles of slow waves were assessed, out of which 897 (76%) were classified as normal antegrade waves, occurring in N=10 (71%) subjects studied. BSGM accurately detected the underlying slow wave in terms of frequency (r=0.99, p=0.43) as well as the direction of propagation (p=0.41, F-measure:0.92). In addition, abnormal gastric slow waves, such as retrograde propagation, ectopic pacemaker, and colliding wavefronts can be detected by changes in the phase information of BSGM.
Conclusion: This study provides evidence of BSMG as a reliable detection of spatiotemporal features of gastric dysrhythmias. Translation can now proceed with confidence to define the clinical potential of the novel biomarkers provided by BSGM, including their relationship to symptoms and ability to impact clinical decisions.

Predicting anti-TNF responses in inflammatory bowel disease patients using intestinal organoids

Highton A[1], Urbano P[2], Fan L[2], Laws G[2], Schultz M[2], Kemp R[1]
[1]Department of Medicine, University of Otago, Dunedin, New Zealand, [2]Department of Microbiology and Immunology, University of Otago, Dunedin, New Zealand.

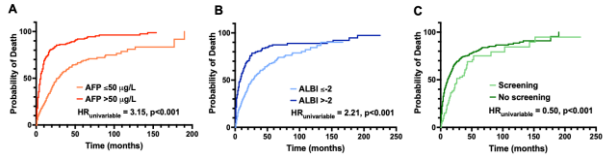
Background: Inflammatory bowel diseases (IBD), including Crohn's disease (CD), affect 30,000 people in New Zealand and costs the healthcare system over NZD 245 million per year. Treatment with anti-tumour necrosis factor (anti-TNF) monoclonal antibodies is effective in some patients but has a non-response rate between 13 – 40%. Whether a patient will respond is unknown before treatment and therefore represents sunk cost and unnecessary treatment side-effects. Human intestinal organoids (HIOs) are miniature three-dimensional organs grown in culture that more accurately represent the epithelium of the gut compared to traditional cell culture. We hypothesise that HIOs cultured from primary colon biopsies can be used to measure intestinal permeability and anti-TNF response at an individual level.
Methods: HIOs from non-IBD individuals and patients with CD were successfully grown in vitro. HIOs were identified in microscopy images using the OrgaQuant software package and a trained dataset, allowing for downstream measurement of FITC-dextran uptake (epithelial integrity), and organoid numbers and size per well (organoid growth). Differences were determined using the non-parametric Kruskal-Wallis test with a post-hoc Dunn's test.
Results: Following treatment with recombinant TNF, CD organoids had increased uptake of FITC-dextran compared to non-IBD organoids, indicating increased permeability in response to the treatment ($p<0.05$). Addition of the anti-TNF monoclonal, adalimumab, reduced the barrier dysfunction ($p<0.001$) and promoted increased CD organoid growth measured by area ($p<0.01$). Co-culture with activated macrophages decreased barrier function in CD organoids, similarly to TNF treatment ($p<0.001$), with adalimumab abrogating the effect ($p<0.001$).
Conclusion: Together, these data indicate that organoids can be used to measure epithelial dysfunction in vitro. Future comparison of in vitro outcomes to patient outcomes following anti-TNF monoclonal treatment may allow accurate prediction of effective treatment for individuals.

Predictors of mortality in hepatocellular cancer secondary to metabolic-associated fatty liver disease: a New Zealand cohort analysis

Dyavadi V[1], Swaminathan A[1,2], Gane E[1,3]
[1]New Zealand Liver Transplant Unit, Auckland, New Zealand, [2]University of Otago, Dunedin, New Zealand, [3]University of Auckland, Auckland, New Zealand.

Background: Metabolic-associated fatty liver disease (MAFLD) is highly prevalent and is a risk factor for hepatocellular carcinoma (HCC), which is associated with significant mortality. This study investigated predictors of mortality in HCC patients with MAFLD (MAFLD-HCC) in a nationwide cohort.
Methods: New Zealand patients aged ≥18 years with MAFLD-HCC were retrospectively reviewed from a national database of all patients referred to an HCC multi-disciplinary meeting between 1998-2020. Univariable and multivariable logistic regression identified baseline variables that predicted 1-year mortality. Univariable and multivariable Cox's proportional hazards models identified baseline variables associated with overall mortality.
Results: In total, 295/2795 patients had MAFLD-HCC; median age 72 years, 220 males, 196 European ethnicity, 173/229 obese and 218/286 had type-2-diabetes. Screening identified MAFLD-associated HCC in 76 patients; 200/272 had advanced fibrosis at HCC diagnosis (METAVIR ≥F3); and 86 had curative treatment (31 resection, 33 ablation, 22 transplant). Median time to death was 10 months (IQR 3-22) and 212 patients died during the study period. Multivariable logistic regression identified alphafetoprotein (AFP)>50µg/L (ORmultivariable=6.12, p<0.001) and albumin:bilirubin index (ALBI)>-2 (ORmultivariable=5.76, p<0.01) predicting 1-year mortality. Overall mortality was predicted by AFP>50µg/L (HRmultivariable=2.60, p<0.001) and ALBI>-2 (HRmultivariable=2.05, p=0.001) on multivariable and univariable (Figure 1) Cox's regression. Screening was not associated with 1-year (OR=0.20, p=0.07) or overall mortality (HR=1.03, p=0.95) on multivariable analysis.
Conclusion: MAFLD is an increasingly significant risk factor for HCC. Baseline AFP and ABLI score but not surveillance predicted mortality in MAFLD-HCC. These results question the cost-effectiveness of HCC surveillance in comorbid elderly populations with MAFLD-associated liver disease.

Figure 1. Baseline factors predicting death in non-alcoholic associated fatty liver disease associated hepatocellular carcinoma on univariable analysis include alphafetoprotein (A), albumin:bilirubin index (B) and screening detected lesions (C).



Primary EUS-Guided choledochoduodenostomy for malignant biliary obstruction - Case presentation and case series

Abdulhamid A
CCDHB, Christchurch, New Zealand.

Background: Endoscopic retrograde cholangiopancreatography (ERCP) is a well-established therapy accepted as first line for relieving benign or malignant biliary obstruction. Though successful for over 90% of patients, Where this fails, including but not limited to a compromised ampulla of vater, options for establishing biliary drainage have traditionally been through Percutaneous Transhepatic Cholangriography (PTC) drain or surgery1,2 EUS-guided choledochoduodenostomy (EUS-CD) offers a strategy to establish fistulisation between the duodenal bulb and distal CBD with benefits of high technical and clinical success, reduced risk of adverse events and re-intervention, and a less invasive procedure than surgery in what is most commonly a palliative setting (2).
Case: Mr. Y is a 67 year old male who presented with painless jaundice with CT demonstrable fullness at the ampulla. This developed in the setting of a known, presumed benign, growth at the ampulla that had been followed serially.
Case series: 29 EUS-CD have been completed in CCDHB from 2017-2022. All cases were technically and clinically successful however in 2 cases, ongoing sepsis and multiorgan impairment would lead to the patient's demise. 41% were performed as the primary procedure with the remainder being pursued after failed ERCP. 14% of these cases were outpatients with same day discharge. The time in hospital for the inpatients were more variable related to factors unrelated to the procedure. 3 cases had significant complications. This included perforation of the gall bladder with biliary leak leading to sepsis, rupture of the ERCP balloon with retained plastic (which didn't go on to cause any clinical complication), and one patient who had pancreatitis as well as duodenal arterial bleeding requiring emergency coiling under interventional radiology.
Conclusion: The success of EUS-CD as the primary approach for MPO adds to the literature supporting this modality as a safe and effective means to achieve palliative biliary drainage.

Prophylaxis of Hepatitis B re-infection following hepatitis B related liver transplantation: A large retrospective single centre experience

Nagappan S[1,2], Gane E[1]
[1]Auckland City Hospital, Auckland, New Zealand, [2]Taranaki Hospital, New Plymouth, New Zealand.

Background: There is limited data currently in the literature on effectiveness of hepatitis B immunoglobulin (HBIG) free regimens in preventing Hepatitis B (HBV) recurrence following liver transplantation (LT). The purpose of this retrospective study was to see if the newer HBIG-free HBV prophylaxis regimens were as effective as HBIG-containing regimens in prevention of HBV re-infection following LT.
Methods: We retrospectively looked at all HBV related LT that took place in the liver transplant unit at Auckland City Hospital from September 1998 to August 2020. Relevant data were collected including type of initial prophylaxis received and maintained on, evidence of HBV and hepatocellular carcinoma (HCC) recurrence following LT.
Kaplan Meir survival curves were plotted and compared using log rank test. The Prism 3.0 statistical package was used. Statistical analysis performed included comparing overall survival (OS), HBV recurrence free survival (RFS) and HBV recurrence free survival including recurrent HCC

between the 3 groups of patients who received HBIG long term, HBIG for 1 week and no HBIG following LT.
Results: 156 HBV related LT took place in the liver transplant unit at Auckland City Hospital from September 1998 to August 2020.12 patients (8%) had HBV recurrence.11 patients (7%) had HCC recurrence.80 patients (51%) had pre- transplant HCC. The OS was significantly higher in the no HBIG and HBIG 1 week group compared to HBIG long term group (P<0.01).HBV RFS showed trend to better survival in patients who received no HBIG or HBIG for 1 week compared to patients that received HBIG long term (P=0.23).
Conclusion: HBIG-free HBV prophylaxis regimens offers better OS compared to HBIG-containing regimens and shows a trend to benefit in HBV RFS. This supports evidence that HBIG-free HBV prophylaxis regimen appears to be as effective. The overall survival following HBV related LT is very good.

Real-B risk score utilisation in hepatocellular carcinoma surveillance strategy at liver unit in Auckland City Hospital

Nagappan S[1], Ray-Chaudhuri D[2], Gane E[2]
1Taranaki Base Hospital, New Plymouth, New Zealand, 2Liver Unit, Auckland City Hospital, Auckland, New Zealand.
Background: The REAL-B score has been demonstrated in recent years to be effective in stratifying hepatocellular carcinoma (HCC) risk in chronic hepatitis B (CHB) patients on oral anti-viral (OAV) treatment. Real-B score of 5 equates to 5% risk of HCC at 10 years. Since mid 2020, the liver unit at Auckland hospital planned to add patients with Real-B score > 4 for HCC surveillance strategy with 6 monthly ultrasound and Alpha Fetoprotein (AFP) check. The purpose of this retrospective study was to determine whether our decisions to commence HCC surveillance in patients with CHB on OAV treatment were consistent with the REAL-B calculated risk.
Methods: We included 490 patients from Auckland Hospital with CHB that were on OAV treatment for at least 12 months and with no HCC at baseline. We collected relevant data including outcome of HCC during follow-up and derived Real B score for each patient.
Results: 222 (45%) patients with CHB on OAV therapy had Real-B score of >4, of whom 69% were receiving 6 monthly liver ultrasound scans and AFP measurements. 27 (6% of total) patients had developed HCC during follow-up. 85% of our patients who developed HCC had Real-B score of >4. 19% of patients who developed HCC with Real-B score >4 were not on 6 monthly ultrasound surveillance.
Conclusion: Most HBV-related HCC's developed in patients with REAL-B score >4. Although most patients with Real-B score >4 underwent appropriate HCC surveillance (6 monthly liver ultrasound scans and AFP measurements), almost one third did not. The most common reasons were non-compliance and/or loss to follow-up, both previously associated with high deprivation index (Horsfall et al, 2020). These results highlight need for additional support, in order to improve equity for Māori and Pacific Island patients and health outcomes for all patients living with hepatitis B.

Retrospective single centre review on referrals to gastroenterology for elderly patients: demographics, indications and complications from procedures performed

Htoo A, Murad A, Stuart C, Huang J
Middlemore Hospital, Auckland, New Zealand.
Background: Endoscopy has become the mainstay of diagnostics and therapeutics in the gastrointestinal tract in the 21st century. It has become easily accessible and increasing numbers of endoscopy procedures are performed each year. As our population ages, more and more frequently elderly patients are being referred for endoscopy. This study reviews the indications, outcomes, and complications of elderly patients referred to a tertiary centre endoscopy unit.
Methods: All endoscopy referrals from February to April in 2020 were compared to the same months in 2021, using our referral database. This was to see whether there has been an increased demand between the 2 years. We excluded all patients less than 80 years old.
Results: A total of 331 patients above the age of 80 were referred in two 3 month periods we studied. In the 3 months of 2020 there were a total of 116 patients. In 2021 there were 215 referrals, nearly double over the same time period. The average age of the population was 84.2 years. The mean clinical frailty score was 4. The preliminary data shows the most common indication for referral was iron deficiency anaemia (14.8%) followed by gastrointestinal bleeding (12%). A total of 11.4% of the patients were declined. From the 2021 cohort there were seven major complications, one pulmonary embolism, two stroke, one syncope during the same day of the procedure, two perforations and one patient deceased with aspiration pneumonia.
Conclusion: There has been a nearly 100% increase in referrals for elderly patients from 2020 to 2021. We found that a significant proportion of referral were inappropriate. Major complication rate of 3.2% from endoscopy in this population is much higher than complication rate in general population.

Review of clinical outcomes for children with raised faecal calprotectin, excluding established inflammatory bowel disease

Humphrey O, Hurley (Vernon-Roberts) A, Day A
University of Otago, Christchurch, New Zealand.
Background: Faecal Calprotectin (FC) is a marker of gut inflammation frequently used to assess disease activity for children with inflammatory bowel disease (IBD). The cause and relevance of raised FC outside the context of IBD has had minimal attention. This study aimed to address this gap in the literature.

Methods: This was a retrospective cohort study. Data on FC test results were obtained for children (<18 years at test) in the South Island, NZ, sampled between 2018-2020. Children with FC results >50µg/g were included, children with established IBD excluded. Patient data were extracted from electronic health records. FC results were natural log transformed to account for highly skewed data, group means compared using ANOVA. Ethical approval was obtained.
Results: Of the 2475 FC tests retrieved 368 met inclusion criteria, of these 101 (27%) had ≥1 repeat FC test. Participant mean age 11 years (SD 5.7), 173 (47%) male. Diagnoses relating to initial FC test were categorized: functional gastrointestinal (GI) [19%], GI-infectious disease [11%], food/nutrition [5%], GI-inflammatory [7%], GI-structural [4%], non-GI [3%], unknown cause [31%], diagnostic for IBD [15%], longitudinal IBD diagnosis [3%], coeliac disease [1%]. FC results were significantly higher ($p<0.001$) in those with GI-infectious diseases and IBD (diagnostic/longitudinal) compared to all other groups. Main presenting symptoms: abdominal pain (58%), diarrhea (39%), rectal bleeding (19%) and weight loss (18%). Concurrent abnormal test results (among those having each test) were found for: ESR [60%], CRP [41%], iron studies [31%], liver function [38%]. Of those that had an endoscopy at the time of the FC result 102/137 had abnormal findings [74%].
Conclusion: This study provides an initial insight in to outcomes relating to raised FC among children. Further analysis will determine associations between FC results, symptoms, diagnoses, and the additional tests performed, in order to refine the threshold for FC testing.

Single centre experience of Peroral Endoscopic Myotomy (POEM): nursing perspective

Mendoza F, Galazo C
Counties Manukau, Auckland, New Zealand.
Background: POEM is a well-established procedure for management of achalasia. In Counties Manukau, we have performed 21 procedures over 3 years. From its fast paced environment to the rewarding experience of seeing the positive outcomes of the procedure. POEM poses significant challenges both for the endoscopists and the assisting nurse. In nursing perspective, it requires intensive training and good clinical judgment. It requires good understanding and familiarity of the equipment used and requires constant focus to intervene effectively in stressful situations. It involves working closely with the Interventional endoscopist's to ensure smooth flow of the delivery high quality care to the patient. Under stressful situations it is important for nurses to be detail oriented and dedicated to learning procedural steps for each endoscopist they work with. Nursing staff knowledge and skill set has a direct impact on the fluidity of the procedure and delivery of care to the patient.
• The purpose of this study is to evaluate the preparedness of the nursing staff in assisting complex procedure POEM.
• To provide nursing staff with the clinical skill to execute procedures in the theatre to a high standard.
Methods: The interview and questionnaire sample size was 10 registered nurses. A questionnaire and interviews were used to collect retrospective data about encountered nursing challenges in assisting with POEM.
Conclusion: The preliminary results of the research indicate that more procedure exposure is required to enable development of an advanced skill set. Discussions are in progress to develop a group of resource nurses to support bedside clinical learning. Recognizing and managing these challenges is essential for supporting endoscopy nurses to be more efficient in assisting complex procedure such as POEM.

Single centre study of per oral endoscopic myotomy: indications, demographics, complications and outcomes

Htoo A, Ogra R
Middlemore Hospital, Auckland, New Zealand.
Background: Per Oral Endoscopic Myotomy (POEM) is a type of 3rd space endoscopy that has become benchmark treatment of Achalasia, Zenker's diverticulum and spastic oesophageal disorders. Previously, Heller's Myotomy and balloon dilatation were the only treatment options for achalasia each with its limitations. At our institution we performed our first POEM in June 2019 and have done total of 24 POEM procedures. This study focuses only on POEM procedures performed for achalasia and motility disorders by single endoscopist.
Methods: Prospective database of POEM has been initiated and the outcome and demographic data were obtained after reviewing discharge summaries, clinic letters and demographic information obtained from the hospital clinical portal. We used unpaired t test to compare the pre and post-POEM Eckardt score.
Results: Total of 24 patients underwent POEM procedure from February 2019. 21(87.5%) patients had achalasia, and 3 (12.5%) had mid or distal diverticulum associated with distal oesophageal spastic disorder. Mean age of the population was 52.3 (range 21 to 75) years. All the patients were admitted to hospital for observation. Mean hospital stay was 2days. Mean pre-POEM Eckardt score was 8.89 and post-POEM mean Eckardt score was 1.0 ($p<0.0001$ 95% CI 6.78 - 9.0). Only 1 person did not have symptomatic improvement and that person have previous failed previous dilatations and Heller's Myotomy. No direct death due to the POEM procedure but 4 patients developed direct complications from the procedure. Fifteen patients (62.5%) had reflux post procedural but only 4 (16%) describe those symptoms as new. Median follow up time 15.75months (range 1 to 38).
Conclusion: From our study we found POEM is safe and effective management of treatment of Achalasia with minimal hospital stay and massive improvement in quality of life.

Single channel suturing device for the treatment of obesity: a single-center study

Tan Y, R R, Asokkumar R
Singhealth, Singapore, Singapore.

Background: Endoscopic sleeve gastroplasty (ESG) reduces the total gastric reservoir by placing full thickness sutures along the greater curve of the body using a Overstitch device (Apollo Endosurgery, Austin, Tex, USA). This system typically requires a dual-channel endoscope which has limitations including restriction in field of vision, reduction in suction ability and reduced maneuverability. Recently, a novel single-channel endoscopic suturing device (Overstitch Sx, Apollo Endosurgery) was designed to overcome these limitations. Our study aims to highlight the safety and efficacy of this technique in patients within our center.
Methods: 11 patients in our center underwent ESG employing the novel single-channel suturing system in a U-shaped suture pattern. Our primary outcome was to assess technical feasibility and safety. The secondary outcome was to determine the percentage total body weight loss (%TBWL) at 3, 6 and 12months.
Results: The mean +/- SD age and body mass index were 41 +/- 6.7 years and 35.4 +/- 4.7 kg/m2, respectively. The majority were female (64%) and of Chinese ethnicity (54%). The procedure was technically successful in all patients. We used an average of five sutures (range, 4–6), and the mean +/- SD procedure time was 70 +/- 9.8 min. No major complications occurred, and the mean +/- SD length of stay was 1.2 +/- 0.5 day. The mean +/- SD TBWL at 3, 6 and 12 months were 10.1 +/- 3%, 17.1 +/- 4.8 and 15 +/- 5 respectively.
Conclusion: ESG using a novel single-channel suturing system is a safe and effective option for promoting and sustaining weight loss over a follow-up period of 12 months as shown in this study.

Single-use, disposable duodenoscope for low and high complexity ERCP – first case series in New Zealand

Dalkie N, Weilert F, Chin J
Waikato Dhb, Hamilton, New Zealand.

Background: Endoscopic retrograde cholangiopancreatography (ERCP) requires the use of a duodenoscope, that allows biliary tree access by way of an elevator mechanism, housed in the tip of the duodenoscope. Several outbreaks of multi-drug resistant organism (MDRO) infections have been associated with duodenoscopes in recent years, despite adherence to best-practice disinfection.
This case series aims to demonstrate the usability of single-use duodenoscopes during ERCPs of varying complexity.
Methods: ERCP procedures were performed using the single-use duodenoscope (EXALT Model D, Boston Scientific, MA, USA).
Results: Six procedures have been completed using the EXALT duodenoscope.
Patient 1: Assessment of common bile duct stricture using concurrent SpyGlass cholangioscopy with cholangioscopy directed biopsies yielding positive tissue diagnosis of cholangiocarcinoma.
Patient 2: Abnormal biliary anatomy and liver biochemistry. Significant choledocholithiasis and inflammatory stricture requiring precut sphincterotomy and stenting of both pancreatic and biliary ducts.
Patient 3: Hepatolithiasis requiring SpyGlass cholangioscopy and clearance with electrohydraulic lithotripsy (EHL). Good clearance with completion in second session.
Patient 4: Background of metastatic pancreatic cancer on chemotherapy and colonisation with extended-spectrum beta-lactamase organism (ESBL). Complex biliary stricture and prior plastic biliary stents, upgraded to bilateral self-expanding metal stents.
Patient 5: Background of heart transplant and ESBL colonisation. Indicated for choledocholithiasis with successful removal.
Patient 6: Recurrent pancreatitis, biliary access was readily achieved and sphincterotomy performed.
Conclusion: Single-use duodenoscopes can be used to perform complex ERCP and handles similarly to reusable duodenoscopes, and performs well with adjuncts such as SpyGlass cholangioscopy. Its use is appealing in patients with MDRO colonisation or are immunocompromised, in order to minimise risk from duodenoscope associated infections. Further studies are required to evaluate cost-effectiveness of larger scale use. More importantly, manufacturers need to ensure single use products are sustainably sourced and made.

Soldiering on: endoscopy-related injury and ergonomics in New Zealand

Htoo A[1], Boswell T[2], Wall K[1], Huang J[1]
[1]Middlemore Hospital, One Tree Hill, Auckland, New Zealand, [2]Taranaki Base Hospital, New Plymouth, Taranaki.

Background: The increasing demand for endoscopy procedures over the last decade has brought with it an increasing pressure for endoscopists to increase their productivity and undertake more procedures. International literature suggests there is a high prevalence of procedure-related injury among endoscopists. We aim to evaluate the prevalence of endoscopy-related injury in New Zealand, as well as review current access to formal ergonomics training and interventions.
Methods: A questionnaire developed on the Jotform survey platform was distributed to members of New Zealand Society of Gastroenterology, and surgical endoscopists registered with the Conjoint Committee. Demographic data, average number of procedures per week, and involvement in advanced endoscopic procedures was sought. Data in relation to self-reported endoscopy-related injury and its treatment and impact were collected. Respondents were also asked about their exposure to formal endoscopy ergonomics training and interventions.
Result: 94 responses were received. 60 (63.8%) of endoscopists report a history of procedure-related injury. These are reported to be severe in 3.2% and moderate in 38.7%. The most common injuries reported were those of the wrist / hand (45.9%), back (22.9%) and shoulder (11.4%). Only 3 (3.1%) report taking time off endoscopy due to injury. 92.5% of endoscopists have had no formal training in endoscopy ergonomics, and only 1 respondent (1%) has had a formal workplace ergonomics assessment, though 83 (88.3%) express an interest in undergoing such an assessment.

Conclusion: Two-thirds of NZ endoscopists have suffered endoscopy-related injury, though very few have taken time out from endoscopy in order to recover. Poor education and low rates of formal workplace assessment relating to endoscopy ergonomics represents an opportunity to intervene and lessen the impact of endoscopy-related injury on our workforce.

Standardized system and app for continuous patient symptom logging in gastroduodenal disorders: design, implementation, and validation

Sebaratnam G[1], Karulkar N[2], Calder S[1,2], Woodhead J[1], Keane C[1,2], Carson D[2], Varghese C[2], Du P[1,2], Waite S[1], Tack J[3], Andrews C[1,4], Broadbent E[2], Gharibans A[1,2], O'Grady G[1,2]
[1]Alimetry Ltd, Auckland, New Zealand, [2]The University of Auckland, Auckland, New Zealand, [3]Department of Gastroenterology, University Hospitals Leuven, Leuven, Belgium, [4]Division of Gastroenterology, Cumming School of Medicine, University of Calgary, Calgary, Canada.

Background: Functional gastroduodenal disorders include functional dyspepsia, chronic nausea and vomiting syndromes, and gastroparesis. These disorders are common, but their overlapping symptomatology poses challenges to diagnosis, research, and therapy. This study aimed to introduce and validate a standardized patient symptom-logging system and App to aid in the accurate reporting of gastroduodenal symptoms for clinical and research applications.

Methods: The system was implemented in an iOS App including pictographic symptom illustrations, and two validation studies were conducted. To assess convergent and concurrent validity, a diverse cohort with chronic gastroduodenal symptoms undertook App-based symptom logging for 4 h after a test meal. Individual and total post-prandial symptom scores were averaged and correlated against two previously validated instruments: PAGI-SYM (for convergent validity) and PAGI-QOL (for concurrent validity). To assess face and content validity, semi-structured qualitative interviews were conducted with patients. Ethics approval was granted by the Auckland Health Research Ethics Committee and the Conjoint Health Research Ethics Board at Calgary.

Results: App-based symptom reporting demonstrated robust convergent validity with PAGI-SYM measures of nausea (rS=0.68), early satiation (rS=0.55), bloating (rS=0.48), heartburn (rS=0.47), upper gut pain (rS =0.40), and excessive fullness (rS=0.40); all $p<0.001$ (n=79). The total App-reported Gastric Symptom Burden Score correlated positively with PAGI-SYM (rS =0.56; convergent validity; $p<0.001$), and negatively with PAGI-QOL (rS=−0.34; concurrent validity; p=0.002). Interviews demonstrated that the pictograms had adequate face and content validity.

Conclusion: The continuous patient symptom-logging App demonstrated robust convergent, concurrent, face, and content validity when used within a 4-h post-prandial test protocol. The App will enable standardized symptom reporting and is anticipated to provide utility in both research and clinical practice.

Systematic review of diagnostic delay for children with inflammatory bowel disease

Hurley (Vernon-Roberts) A[1], Aluzaite K[2], Khalilipour B[2], Day A[1]
[1]University of Otago, Christchurch, New Zealand, [2]University of Otago, Dunedin, New Zealand.

Background: Paediatric inflammatory bowel disease (IBD) is an inflammatory condition of the gut that may affect physical, psychosocial, and educational outcomes for children. The diagnosis of IBD involves discrete longitudinal phases from the time of first symptoms to clinical confirmation via endoscopy. The term diagnostic delay (DD) refers to prolongation of these phases, with consequences including delayed treatment and poor outcomes. The aim of this systematic review was to synthesise DD data for children with IBD, and identify variables associated with prolonged DD.

Methods: Six health literature databases were searched, with inclusion criteria for papers being: cohort of children aged up to eighteen years with IBD, report a central tendency of their DD data. Summary statistics provided pooled DD periods for IBD and clinical sub-types. Between-group comparisons were made using the Kruskall Wallis test, and continuous variables using linear regression.

Results: Searches identified 236 papers, 28 were included in the final analysis with a pooled cohort of 7368 children. The individual DD periods for cohorts with IBD ranged from 3.1-30 months, CD 3-48 months, UC 1.6-15 months, IBDU 4-10.4 months. Pooled DD periods were significantly different between sub-types (P=0.006): IBD 5 months (m) (IQR 4-16.5m), Crohn's disease (CD) 6m (IQR 4-11.5m), ulcerative colitis (UC) 3m (IQR 2.1-5.0m) and IBD-unclassified 4m (lower IQR 4m). Children with UC were shown to have shorter DD than CD (P=0.002) and UC than IBD (P = 0.007). No demographic or disease specific characteristics were consistently associated with DD. There was a reduction in DD over time (2001-2020) (P=0.014). Studies from newly-industrialized countries had the longest DD periods.

Conclusion: This data can be used to benchmark DD for children with IBD. Individual centers could determine whether improvements to awareness or infrastructure may reduce DD in order to minimize the risk of poor outcomes.

The differential diagnosis for severely damaged small intestinal mucosal changes

Jian C[1], **Rostami K[1],** Hayman D[2], Lockett B[1]
[1]Palmerston North Hospital, Palmerston North, New Zealand, [2]Massey University, Palmerston North, New Zealand.

Background: A range of differential diagnoses have been reported for severe duodenal architectural distortion. The aim of this study was to explore the aetiology of severe mucosal abnormality in patients who presented with this over the past 10 years.

Methods: Clinical and laboratory data of all the patients with severe duodenal architectural distortion diagnosed at

MidCentral District Health Board (DHB), New Zealand were collected and statistically analysed. Ninety-five percent confidence intervals (CI) are shown.

Results: Between September 2009 and April 2019, 235 patients were diagnosed with severe enteropathy. The median age of the patients was 41 years (range 6-83 years). Two hundred and twenty-nine of these patients (97.4%, 94.5-99.1%) were diagnosed with coeliac disease (CeD), with one of these patients having gluten induced T-cell lymphoma. From the remaining six patients, one had a diagnosis of tropical sprue and five did not have a clear aetiology. There were 182 patients from 195 (93.3%, 88.9-96.4%) with at least one positive coeliac marker, all with a diagnosis of CeD. Thirteen patients (6.7% of 195, 3.6-11.1%) had negative markers for both IgA anti-tissue transglutaminase (tTG-IgA) and IgA anti-endomysial antibodies (EMA-IgA) with eight having a diagnosis of seronegative CeD. There were 228 patients (97.0%, 94.0-98.8%) with Marsh III histology, all with a diagnosis of CeD except for four which had an unclear diagnosis and one with both T-cell lymphoma and CeD.

Conclusion: Although the spectrum of histological changes in CeD may range from normal to a flat mucosa, severe duodenal architectural distortion occurs mainly in CeD. Idiopathic enteropathy was the second but by far less frequent presentation of severe enteropathy. This study highlights that infection and other aetiologies are rarely implicated in severe enteropathy.

The efficacy of P-ACB compared with high dose of PPI in patients with refractory GERD

Kim S, Choi S, Chung W

St. Vincent Hospital, The Catholic University of Korea, Suwon-si, South Korea.

Background: Many patients with gastroesophageal disease (GERD) symptoms do not respond to conventional dose of proton pump inhibitors (PPI) therapy and this is so called "refractory GERD." Potassium-competitive acid blocker (P-CAB) directly inhibits H+, K+-ATPase in a reversible manner and result in more profound inhibition of acid secretion. However, efficacy of P-CABs in refractory GERD has not been fully studied.

Methods: A consecutive study was undertaken from March. 2020 to March. 2022, and patients with symptoms who fail 8 weeks of PPI therapy were enrolled. After the cessation of previous PPIs for at least 2 weeks, ambulatory esophageal pH and monometry were performed. Double split dose of rabeprazole (20 mg) or tegoprazan (50 mg) trials for 2 weeks were prescribed, and symptom evaluation was done. The severity of symptom-grading by visual analogue scale (VAS) was assessed at 2 weeks after treatment. Positive response was defined as more than 50% improvement in the VAS for severity of symptom.

Results: A total 46 cases in 42 patients was enrolled. In group with P-CAB therapy (n=15), total positive response rate was 73.3% (11/ 15). There were 5 cases of abnormal acid exposure (excessive esophageal acid exposure time, AET > 6%), and positive response rate was 80.0% (4/5). In group of double split dose of PPI therapy (n=31), total response rate was 64.5% (20/ 31) (P=0.25). Among 10 cases with abnormal AET, the response rate was only 30% (3/ 10). In cases with AET, positive response rate of PCAB and PPI therapy were 80% and 30%, respectively (P= 0.03).

Conclusion: In the patients with refractory GERD, PCAB therapy had corresponding effect with high dose of PPIs. Especially, PCAB therapy would have a superior to PPIs in patients having abnormal AET.

The frequency and predictors of Post Colonoscopy Colorectal Cancer in a regional New Zealand setting

Morreau J, **Khoo C,** Murphy A, Vernon D, Patel R, Williams Y

Te Whata Ora Lakes, Lynmore, New Zealand.

Background: Colorectal Cancer (CRC) is a major cause of morbidity and mortality in New Zealand and colonoscopy is critical for diagnosis [1]. This study aims to identify the frequency and predictors of Post Colonoscopy Colorectal Cancer (PCCRC) in a New Zealand population.

Methods: PCCRC was defined as CRC occurring within 36 months of colonoscopy. Data was also collected up to 60 months in line with previous definitions [2,3,4]. CRC diagnoses over a 5-year period (January 2015 to December 2020) were identified through a regional District Health Board's multidisciplinary meeting data. Electronic patient records were used to identify whether a colonoscopy had been performed within 36 or 60 months of CRC diagnosis. Demographics, indications for index colonoscopy, histology and stage of cancer at diagnosis were recorded. The index colonoscopy reports were interrogated to assess patient comfort, bowel preparation, procedures performed, distracting pathology, such as diverticulosis or haemorrhoids, and specialty of endoscopist.

Results: Of the 349 patients diagnosed with CRC in the study period, 12 and 27 had a colonoscopy performed within 36 months and 60 months, respectively. This gives a 3-year PCCRC rate of 3.7%; congruent with international data [2,3]. At index colonoscopy, all patients had adequate bowel preparation, tolerated the procedure well and underwent a complete colonoscopy. 8 (72%) PCCRC patients had distracting pathology at index colonoscopy. A repeat colonoscopy was performed for a new indication in 5 (41%) patients and 9 (52%) in the 36 month and 60 month PCCRC groups, respectively. General Surgeons performed 7 (64%) of index colonoscopies that subsequently developed PCCRC.

Conclusion: This DHB has a comparable PCCRC rate to internationally reported data. Patients that develop PCCRC are more likely to have distracting pathology at index colonoscopy. PCCRC is common in patients that have a repeat colonoscopy for indications different to their index procedure.

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The impact of COVID-19 restrictions on acute hospital presentations due to alcohol-related harm in Auckland, New Zealand.

Schauer C, **Quon J,** Potdar P, Singh A, Croft D, Wang M
Waitemata District Health Board, Auckland, New Zealand.

Background: New Zealand's public health response to the COVID-19 pandemic has largely been considered successful, although there has been concerns surrounding the potential harms of the lockdown restrictions enforced, including alteration of alcohol consumption. New Zealand utilised a four-tiered alert level system of lockdowns and restrictions, with level 4 denoting strict lockdown. The current study aimed to compare alcohol-related hospital presentations during these periods with corresponding calendar-matched dates from the preceding year.
Methods: We conducted a retrospective case-controlled analysis of all alcohol-related hospital presentations between 01/01/2019 to 02/12/2021, and compared COVID-19 restriction periods to corresponding calendar-matched pre-pandemic periods. Data on demographic, clinical, and admission characteristics were collected.
Results: A total of 3722 and 3479 alcohol-related acute hospital presentations occurred during the four COVID-19 restriction levels and corresponding control periods respectively. Alcohol-related presentations accounted for a greater proportion of all admissions during COVID-19 alert levels 3 and 1 than the respective control periods (both $p<0.05$), but not during levels 4 and 2 (both $p>0.30$). Acute mental and behavioural disorders accounted for a greater proportion of alcohol-related presentations during alert levels 4 and 3 (both $p\leq0.02$), although alcohol dependence was present in a lower proportion of presentations during alert levels 4, 3, and 2 (all $p<0.01$). There was no difference in acute medical conditions including gastroenterological diagnoses of hepatitis and pancreatitis during all alert levels (all $p>0.05$).
Conclusion: Alcohol-related presentations were unchanged compared to matched control periods during the strictest level of lockdown, although acute mental and behavioural disorders accounted for a greater proportion of alcohol-related admissions during this period. New Zealand appears to have largely avoided the general trend of increased alcohol-related harms seen internationally during the COVID-19 pandemic and its lockdown restrictions.

The low FODMAP diet in children with Crohn disease – a case series report

Brown S, Wall C, Gearry R, Day A
Otago University, Christchurch, New Zealand.

Background: There are currently no data on the use of the low FODMAP diet (LFD) in children with quiescent inflammatory bowel disease (IBD). The aim of this report was to describe the outcomes of the LFD in children with IBD with concurrent functional GI (FGD) symptoms.
Methods: This case series included children aged 7-14 years with quiescent Crohn disease (CD) and overlapping FGD symptoms. All children received three dietetic consultations. Anthropometry was measured at the baseline and second consultations. GI symptom response was assessed using subjective measures, including physician documentation in clinical notes based, standardized questions asked by the dietitian at the dietary consults, and patient symptom diaries. Effectiveness of the intervention was measured by performing a symptom response survey. Mean (standard deviation [SD]) and number (percentage) were calculated for continuous and categorical data, including baseline characteristics, anthropometry, GI symptoms, and outcomes.
Results: Six children (five female) with quiescent CD completed the LFD. The mean number of years since diagnosis was 2.4 years (1.3 – 3.5). All children presented with abdominal pain (100%), 4 (66.6%) with diarrhoea, 5 (83.8%) with bloating/distention and 2 (33.3%) with nausea. No children reported constipation and all children were classified as having a normal BMI at baseline (mean BMI z-score 0.53 (-0.66 - +0.99). Complete resolution of symptoms was observed in 4 (66.6%) of those with diarrhoea, 4 (66.6%) with bloat/distention, 3 (50%) with abdominal pain while one (16.6%) had improved nausea.
Conclusion: Further studies are required to ascertain the efficacy of the LFD in children with quiescent IBD. However, this case series demonstrates the LFD may be considered as a safe dietary option to help alleviate overlapping IBS-like symptoms in children with CD, but only under the direction of a qualified paediatric dietitian.

Dietary nutrient intake and blood micronutrient status of children with Crohn disease compared to their shared-home environment, healthy sibling

Brown S, Wall C, Frampton C, Gearry R, Day A
Univeristy of Otago, Christchurch, New Zealand.

Background: There is a paucity of data examining the dietary intake and blood micronutrient status of children with Crohn disease (CD). The study aims were to assess the dietary intakes of ambulatory children with CD compared with their healthy, shared-environment siblings using the recommended daily intakes (RDIs), and to assess blood micronutrient status of both cohorts.
Methods: A prospective, observational study of children aged 5-17 with CD (cases) and their shared-environment sibling (controls) was completed. A four-day food/beverage diary was used to analyze dietary nutrient intakes and blood samples were taken to measure micronutrients. Statistical analyses were completed using SPSS software.

Results: Sixty children completed this study. Dietary intakes of cases and controls was similar for most nutrients except for vitamins A and E, copper, zinc, iron and selenium ($p<0.05$) were significantly lower for controls. Nutrient intakes of children using partial enteral nutrition (PEN) was higher for polyunsaturated fats, vitamin A, thiamine, riboflavin, niacin, folate, vitamin C, copper, iodine, iron and selenium ($p<0.05$) compared to children not using PEN. Dietary fiber ($p=0.023$) and vitamin K (0.035) were lower in children using PEN compared to children not using PEN. Cases had lower blood micronutrient concentrations for copper, folate, zinc ($p<0.05$); while controls had lower phosphate ($p<0.05$). Disease scores were negatively associated with lower serum iron concentration ($p<0.05$). Ileal disease and colonic disease were correlated with higher copper and magnesium concentrations ($p<0.05$).
Conclusion: New Zealand children with CD and their shared-environment siblings were not meeting dietary requirements for several micronutrients. This suggests that nutritional supplementation may need to be considered to help meet the RDIs for age. Further research is required to develop strategies that utilize food and supplements (including PEN) to improve the nutrition of children with CD.

Tumor Necrosis Factor (TNF) signaling drives expansion of deep secretory, Reg4+ epithelial cells in Ulcerative Colitis

Gadeock S[1,2,4], Liu C[1,3,4], Girish N[1,4], Huang Y[4], Grikscheit T[4], Polk D[1,4]
[1]University of California San Diego, San Diego, USA, [2]University of Otago, Dunedin, New Zealand, [3]The University of Chicago, Chicago, USA, [4]Children's Hospital Los Angeles, Los Angeles, USA.
Background: Unraveling outcomes of cell-specific targets of TNF-signaling is essential to understand the loss of therapeutic response of anti-TNFs in IBD. Regenerating islet-derived protein 4 (Reg4), a recently identified marker of colonic deep crypt secretory cells (DCS), highly upregulated in IBD, is therapeutically intriguing because it activates epithelial regeneration during mucosal healing, however, much remains unknown. Here we investigated whether activating TNF-TNFR1 signaling affects the Reg4 cell lineage.
Methods: TNFR1 regulation of REG4 was determined in human pediatric non-IBD (control) and UC patients, and in human control-colonoids challenged with TNF and an anti-TNFR1 antibody. In mice, Reg4 was determined in animals with epithelial TNFR1 depletion (Vil1-Cre;TNFR1fl/fl) and in TNF-treated TNFR1-/--colonoids. Reg4 in chronic colitis was determined using the Il10-/-TNFR1fl/fl and Il10-/-Vil1-Cre;TNFR1fl/fl animal models.
Results: REG4 did not identify the DCS lineage in healthy human colon, as it localized specifically to differentiated cells, but in UC patients, expanded the REG4+ cell lineage to the crypt-base, like the mouse colon. In Vil1-Cre;TNFR1fl/fl animals, Reg4+ cells were reduced by 55% compared to TNFR1fl/fl mice. Consistently, TNFR1-/--colonoids showed a 36% reduction in Reg4+ cells relative to controls, demonstrating that epithelial TNFR1 signaling specifies mouse DCS. In human control-colonoids, TNF significantly increased (2-fold) the expression of the REG4+ cell lineage, that was completely blocked by treatment with an anti-TNFR1 neutralizing antibody. Similarly, in mouse-colonoids, TNF recovered Reg4+ cells in a dose-dependent manner, which was inhibited in TNFR1-/--colonoids. In chronic inflammation, Reg4+ cells were significantly ($p<0.01$) reduced in Il10-/-Vil1-Cre;TNFR1fl/fl relative to Il10-/-TNFR1fl/fl animals, resulting in a reduced injury score, chemokine expression, and crypt hyperplasia in Il10-/-Vil1-Cre;TNFR1fl/fl animals.
Conclusion: Our study reveals a novel key mechanism by which TNF promotes specification of Reg4+ cells in the colon. Understanding outcomes of TNF-driven cell-specific targets will help tailor anti-TNF therapeutics to increase efficacy in IBD.

Uncovering the immunomodulatory effects behind gastrointestinal hookworm therapy

Noble S[1], Lavendar B[1], Vacca F[1], Maclean K[1], Yumnam B[1], Te Kawa T[1], Mules T[1], Le Gros G[1], Camberis M[1], Inns S[2]
[1]Malaghan Institute of Medical Research, Wellington, New Zealand, [2]University of Otago, Wellington, New Zealand.
Background: Helminth parasites reside in the gastrointestinal tract and regulate the host immune system, giving them huge potential as an immunological therapeutic for gastrointestinal diseases. Hookworm therapy has many advantages over conventional therapies. Due to their co-evolution with humans, hookworms are uniquely adapted to humans and are well-tolerated. Furthermore, hookworm therapy is dose-controlled and long lasting, with hookworms surviving in the host for 5 years. Further investigation into immunological changes induced by helminths is warranted to uncover the clinical potential for hookworm therapy.
Methods: We have conducted a one-year healthy human hookworm trial, in which 12 participants were infected with N.americanus. We analysed changes in immune cells in blood via flow cytometry and conducted ELISAs to detect faecal biomarkers of gut inflammation. We have also conducted in vivo models of helminth infection using the parasite H.polygyrus.
Results: Human hookworm infection induced transient blood eosinophilia, while no other immune cell populations were perturbed. Hookworm infection transiently increased levels of eosinophil, but not neutrophil, degranulation products detectable in stool. Furthermore, elevated faecal calprotectin during acute infection indicates a hitherto under-appreciated role of gastrointestinal eosinophils in calprotectin production. In vivo models of helminth infection revealed that helminths induce tissue-specific eosinophil subpopulations.
Conclusion: Hookworm infection induces a specific eosinophil response, with systemic eosinophilia and activation of gastrointestinal eosinophils at the acute phase of infection, but suppression of these responses during chronic infection. Given the dual role of gastrointestinal eosinophils as homeostatic cells or, under inflammatory conditions, as contributors to the cycle of inflammation, the modulation of eosinophil subtypes could be one of the mechanisms behind

the beneficial immunoregulatory effects of hookworms. These findings provide valuable insight into the clinical potential of hookworm therapy and contribute to our understanding of the fascinating interplay between hookworm and host.

Using the Faecal Immunochemical test (FIT) to reprioritise new patient symptomatic cases waiting for colonoscopy

Falvey J[1], Sies C[1], Levin S[1], Willington A[1], Whiteley L[1], Mollard P[1], Stedman C[1,2], Afroz N[1], Jones R[1], Mouthaan P[1], Dunn J[1], Burt M[1], Gearry R[1,2], Frizelle F[1,2], Frampton C[2], Awadalla M[1], Glynn T[1], Eglinton T[1,2], Tapper R[1], Robertson G[1], Bradford G[1], Burrows A[1], Weale H[1]
[1]Te Whatu Ora Canterbury, Christchurch, New Zealand, [2]University of Otago/Christchurch, Christchurch, New Zealand.

Background: Quantitative faecal haemoglobin (FHb) measurement by FIT is a powerful biomarker for advanced colorectal neoplasia. FIT provides the basis for the New Zealand National Bowel Screening Program, has been used elsewhere to reprioritise cases awaiting colonoscopy following pandemic delays, and has been incorporated into referral, prioritisation and triage protocols for symptomatic cases in other countries. We report provisional results regarding the use of FIT to reprioritise non-urgent new patient symptomatic cases awaiting colonoscopy (Col) in Canterbury.

Methods: All cases from the non-urgent symptomatic waiting list aged ≥50years (≥40 years Māori/Pacific) invited to provide a stool sample for FIT. Following FIT testing, cases re-triaged with usual outcomes as follows; FHb ≥150mcg/g - urgent colonoscopy, 10-149mcg/g - colonoscopy <6weeks, <10mcg/g computed tomography colonography (CTC). Project period 7thJuly-7thSeptember 2022. Data here correct as of 26th August, 2022. Final results available November 2022. Target 400 cases.

Results: 258 cases invited to date. Valid/Invalid samples returned 210/0. Outcomes by FHb concentration and mode of investigation shown below.

FHb	≥150mcg/g		10-149mcg/g		<10mcg/g	
N (% analysed samples)	9 (4.3)		30(14.3)		171(81.4)	
Investigation	Col	CTC	Col	CTC	Col	CTC
Performed (Requested)	4(5)	0(0)	10(19)	0(1)	5(3)	78 (85)
CRC	0	-	3	-	0	1*
Advance polyp	1	-	2	-	3	2*
Simple polyp	1	-	2	-	0	5*

*by size criteria/appearance- awaiting colonoscopy

Conclusion: The proportion of results falling below 10mcg/g and ≥150mcg/g are consistent with international experience. To date too few cases have completed investigation to make firm conclusion, however, full results of the audit will be available by November 2022. The results of this audit will inform the development and implementation of a formal FIT/symptom pathway for New Zealanders with colorectal symptoms.

Validation of an endoscopy training box as a tool for skills assessment

Glassey E, Walmsley R
Auckland Dhb, Auckland, New Zealand.

Background: Endoscopy training and assessment of competency is currently based on a combination of subjective scoring of Directly Observed Procedural Skills (DOPS) and number of cases where Key Performance Indicators (such as caecal intubation) are reached. Endoscopy simulators of varying complexity and expense have been proposed to introduce objective assessment into training and credentialing.

Methods: Together with Kmon Medical we have developed an endoscopy training box prototype which is simple enough and cost efficient enough to be relevant to a wide range of teaching environments. The box comprises four tasks of increasing complexity which utilise fine tip control, torque and retroflexion techniques. Each assessment takes 20 minutes. Endoscopists with experience from novice to 10 years and a with a range of endoscopic skills were assessed. A scoring system devised was which maximises the differentiation in performance level. Trainee endoscopists were assessed at regular intervals throughout training.

Results: A pilot study of 10 endoscopists has demonstrated correlation between experienced endoscopists and higher assessment performance. Trainee endoscopists also performed better at later intervals in their training.

Conclusion: There is currently no widely used training box used in Australasia for the purpose of regular assessment of endoscopic skill. This tool, once validated, would provide an easily repeatable and standardised assessment tool in addition to current assessment criteria. It may also prove useful in assessing those applying for Endoscopy Training and could be utilised for practicing motor skills throughout training.

Who's probing the sphincter? A survey of the current NZ ERCP workforce

Willington A, Arnold M
Canterbury District Health Board, Christchurch, New Zealand.

Background: Limited data are presently available on the current NZ ERCP workforce. We sought to address this knowledge deficit.

Methods: An anonymous workforce survey was sent to 36 ERCP endoscopists. A separate questionnaire regarding ERCP service provision was sent to clinical/endoscopic leads at all DHBs.

Results: To date, 24/36 (67%) endoscopists responded to the workforce survey and 4/16 (25%) clinic/endoscopic leads responded to the service provision questionnaire. Results of the workforce survey only are presented here with the expectation that results from the service provision questionnaire will be available to present at NZSG ASM.

The mean age of respondents was 51.6 years (range 36 – 63 years). 25% of respondents were aged 60 or older and 37.5% intended to retire from ERCP within the next 5 years.

87.5% of respondents identified as male and 12.5% as female. 75% described their ethnicity as European (NZ European or Other European), 16.7% as Asian, 4.2% as Other and 4.2% did not disclose their ethnicity. No respondents identified as Māori or Pacific peoples. 70% of respondents were Gastroenterologists and 30% Surgeons. 83% had □5 years' experience performing ERCP. 16.7% reported performing <50 ERCP annually, 41.7% 50-100 annually, 33.3% 100-150 annually and 8.33% performed >150 annually. 58.3% felt access to monitored anaesthesia care for ERCP was adequate, whilst 41.7% did not.

Conclusion: The demographic of the current NZ ERCP workforce does not accurately reflect the overall population that it serves. There is significant under representation of Māori and Pacific people ethnicities and female gender. Nearly 40% of respondents intend to retire from ERCP within 5 years. Workforce planning should take the above into consideration. The majority of endoscopists perform a low volume of ERCP (<50 - <150 annually). A significant minority feel access to monitored anaesthesia care is inadequate. Future studies could explore reasons for this.