Background: e-learning is a potentially cost-effective, flexible method for training health professionals in obesity management.

Aims: Pilot the Weight4KIDS health professional e-learning program for paediatric obesity management to assess its uptake, acceptability and impact on participant learning outcomes.

Methods: Weight4KIDS is a series of 11 e-learning modules: a core module (basic assessment and initial management) and advanced modules (physical measurements, practical interventions, adolescent obesity, general medical issues, endocrine aspects, orthopaedic issues, nutrition, physical activity, sleep and psychosocial issues). Health professionals from six sites (three non-metropolitan) were invited to complete modules. Participants’ knowledge on module topics was assessed at baseline. A post-training survey assessed participants’ knowledge, views on module duration/content and intention to improve clinical practice.

Results: The core module took 20 minutes (median) (IQR: 13 to 37) to complete (n=130; 71% nurses; 55% non-metropolitan). Participation in advanced modules varied (range: n=18 to 70) with median completion times across modules ranging from 2-10 minutes. In all modules there was a statistically significant (P<0.05; related-samples Wilcoxon Signed Rank Test) improvement in participants’ pre- to post-training knowledge scores. Most participants (range across all modules) indicated module completion: occurred during work time (58% to 84%), was of appropriate duration (81% to 100%) and detail (83% to 96%), and prompted intention to improve clinical practice (74% to 93%).

Conclusions: Weight4KIDS improved participants’ knowledge of paediatric obesity management and was highly acceptable to a predominately nursing sample. The results support wider rollout of Weight4KIDS. The poor uptake by medical and allied health staff warrants further investigation.

Funding source: Western Child Health Network, New South Wales Department of Health, Australia.

Effectiveness of current interventions in obese New Zealand children and adolescents

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Meta-analyses and systematic reviews of multi-disciplinary intervention programmes for child and adolescent obesity have shown they lead to clinically significant improvements in weight and cardio-metabolic outcomes in the short to medium term.1,2 New Zealand Ministry of Health guidelines currently support a multi-disciplinary approach to child and adolescent obesity, but very few of these programmes exist nationally.3

Aim: To determine the effectiveness of current interventions in New Zealand in obese children and adolescents accessing either a standard model of care (medical input alone or with the addition of dietitian and physical activity input), or one of the country’s long-standing multi-disciplinary intervention programmes.

Methods: Data were collected from 290 patients across four centres in New Zealand who manage obese and overweight children and adolescents aged 3-16 years in Paediatric clinics. Ethnicity, gender, height, weight and nature of intervention over medical assessments spanning an average of 2.1 years from baseline were collected. Body Mass Index (BMI), BMI percentile and BMI standard deviation score (SDS) were then calculated.

Results: There was a small but significant annual reduction in BMI SDS irrespective of the nature of intervention (-0.15 overall). There was no significant difference in BMI SDS between interventions. The extent of BMI SDS reduction decreased with increasing age at first outpatient attendance (p=0.0006). BMI SDS reduction was unaffected by ethnicity or gender.

Conclusions: Mild reductions in BMI SDS are achievable in children being referred to and managed for obesity by a range of models. It is important that paediatricians are proactive in identifying and addressing obesity with families. Further research is required to evaluate multi-disciplinary intervention programmes, and how their effectiveness can be increased, given their recognised benefits in improving weight and cardio-metabolic profile.


RAFG - Relative Adult Fat Gain
Ted Arnold

In my 15 years’ experience with thousands of corporate male clients in a purely preventive practice
* average BMI is just above 26, when we know that it should be 22-23
* eyeballing the average male gives me a picture of usually over 20 and often about 25% body fat
* the vast majority of clients recall a trouser size of 81 cm at young adult best, and the average on presentation is above 90 cm
* most of these folk show some form of at least one metabolic derangement, and often more
* There is a huge pool of sub-obese overfat individuals with various derangements who merit treatment by body fat reduction who are being left with a mistaken impression that, because their standard measurements such as BMI, waist, waist:hip are within range or only marginally high, therefore their health behaviour is not worthy of some remedial body fat reduction
* I suggest that body fat % via eyeballing and comparing the THEN to the NOW is probably the most practically effective method of identifying these clients

* Apart from comparison of weight, BMI, waist and waist:height, there also be merit in applying 80% weight gain is fat gain and ¾ cm=1kg fat gain algorithms

* The more concordant these are with the results of the eyeballing method, and vice versa, the more power to the conclusions

* Some might say that impedance or ADP measurement of body fat % on presentation is possibly a good idea, but it means comparing the result of a more accurate method with the recalled/eyeballed method, and conclusions are only as valid as the least reliable statistic; and even these sophisticated methods have their own systemic and measurement errors as well

* So perhaps it’s better to use just eyeballing?

1. Garry Egger suggested this might be worth presenting

What does the EPOCH (early prevention of obesity in childhood) prospective meta-analysis tell us about early life obesity prevention?

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Introduction:
Efforts to prevent the development of overweight/obesity have increasingly focused early in the life course as we recognise that both metabolic and behavioural patterns are often established within the first few years of life. Randomised controlled trials (RCTs) of interventions are even more powerful when, with forethought, they are synthesised into an individual participant data (IPD) prospective meta-analysis (PMA). The EPOCH Collaboration was formed in 2009 to undertake this project.

Methods:
EPOCH comprises four RCTs of obesity prevention strategies commencing before 6 months of age. Its main objective was to determine if early intervention to prevent childhood obesity impacts on body mass index (BMI) z-scores at age 18-24 months. Secondary endpoints include: overweight / obesity, breastfeeding, TV viewing, sleeping patterns, physical activity, dietary quality, parenting self-efficacy and feeding practices. Data from these studies were prospectively planned to be combined into an IPD set. The principal analysis method for aggregating the data across trials was a one-step linear modelling approach that included treatment effect as a fixed effect and accommodated the clustering introduced by one trial. Multiple-imputation was used to evaluate the impact of missing data for the primary endpoint.

Results:
The study cohort of four trials comprises 2196 women/infants. Data for the primary outcome were available for 78% of the cohort. The mean BMI-z score at 18-24 months was 0.67 (95% CI: 0.60 to 0.74) for the intervention group and 0.80 (95% CI: 0.73 to 0.87) for the control group. The estimated difference was -0.13 (95% CI: -0.23 to -0.03; p=0.012). The multiple-imputation analysis estimated the difference at -0.10 (95% CI: -0.20 to 0.00; p=0.04). Median duration of breastfeeding was significantly longer in the intervention arm (35 weeks [95% CI: 30 to 37] versus 28 weeks [95% CI: 26 to 30]; HR=0.89 [95% CI:0.8 to 0.98]; p=0.022). The proportion of children viewing
EMPOWER: The development and pilot-testing of an evidence-based weight loss mobile telephone app

Kylie Ball, Kok-Leong Ong, Michelle Jackson, Jing Zhang, Sarah McNaughton, David Crawford

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Addressing the obesity epidemic requires innovative, scalable behaviour change approaches with broad reach and sustainability. Mobile technology may help meet these objectives. This study aimed to develop and pilot-test a theory-based mobile telephone weight loss app, Empower, among adults. Empower was designed based on evidence-based behaviour change strategies, including control theory constructs such as setting weight loss, physical activity and dietary goals; self-monitoring; and receiving tailored feedback. A convenience sample of 16 participants, mean age 35y (SD=9), were provided with the app for their iphone (or on a loaned iPod) and asked to use it for one month. They completed pre- and post-test surveys assessing experience with mobile apps, and (post-test only) Empower app use/perceptions. At pre-test all participants reported that they had used mobile apps at least occasionally. At post-test, ten participants reported using the Empower app daily or on most days. All but two reported that they found it easy to use; all but three agreed using the app was enjoyable. However, six participants indicated that the app didn’t work the way they wanted it to, and nine noted that the app did not do everything they expected it to. Suggested improvements related to increasing flexibility to enter data, adding more goals and tips,
Induction of heme-oxygenase (HO-1) does not enhance adiponectin production in human adipocytes: evidence against an HO-1/adiponectin axis

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Adiponectin is a salutary hormone produced by adipocytes, and hypoadiponectinemia is implicated in the aetiology of obesity-related cardiometabolic diseases, making therapeutic strategies to increase adiponectin attractive. Emerging evidence, predominantly from preclinical studies, suggests that induction of HO-1 increases adiponectin production. The main aim of this study was to determine whether induction of HO-1 enhanced adiponectin production from adipocytes.

Treatment of mature human SGBS adipocytes with cobalt protoporphyrin (CoPP) for 24-48 hours promoted a dose-dependent increase in HO-1 (mRNA and protein) without affecting adiponectin secretion. The pro-inflammatory cytokine TNFα is increased in obesity and involved in the progression of obesity-related diseases. Treatment of adipocytes with TNFα reduced adiponectin secretion and increased expression and/or secretion of pro-inflammatory cytokines (IL-6, TNFα & MCP-1) and expression of an ER stress marker (sXBP-1). HO-1 induction failed to reverse these effects.

Further investigations exploring the effects of chronic (14 day) CoPP or Hemin treatment on adipogenesis revealed a dose-dependent inhibition of differentiation indicated by decreased lipid droplet accumulation, decreased adiponectin secretion, downregulation of key genes necessary for adipogenesis and adipocyte function (Pparg, AdipoQ and Glut4), increased IL-6 secretion and decreased insulin-stimulated glucose uptake.

Our results demonstrate that: acute induction of HO-1 does not enhance adiponectin secretion in mature human adipocytes; chronic HO-1 induction interferes with differentiation and subsequent adipocyte function. Collectively, these findings argue against a direct HO-1/adiponectin axis, and do not support a beneficial role for HO-1 in adipocyte development or function.

Psychological treatments for insomnia and improving adherence in obstructive sleep apnea

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Change only occurs in the present. When individuals have a better understanding of their respective diseases and the treatment options they are more likely to undertake sometimes difficult treatments. Educational information is a key component in this process along with cognitive behavioural treatment interventions for both insomnia and Obstructive Sleep Apnea (OSA). These programs will be discussed in detail in conjunction with the acknowledgement of individual responses to treatment for a variety of reasons. Current research projects will also be explored and how we as clinicians and researchers are working to having a better understanding of how some individuals are very vulnerable to the effects of a disease whilst others have more resilience.

Exercise, strict physical inactivity (experimental bed-rest) and their effects on visceral adipose tissue and fat distribution

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Background: There are regional differences in the response of fat mass distribution to increased physical activity, caloric restriction and hyper-caloric intake. We hypothesized that strict inactivity (bed-rest) would lead to regional differences in fat deposition.

Methods: Twenty-four male subjects underwent 60d bed-rest (2nd Berlin BedRest Study) and remained inactive (n=9), performed resistance exercise plus whole-body vibration (RVE; n=7) or resistance exercise only (RE; n=8). Fat mass was assessed via dual X-ray absorptiometry. Insulin sensitivity was quantified by the euglycemic hyperinsulinemic clamp technique. P-values were adjusted via the false discovery rate method to guard against false positives.

Results: In the inactive subjects, fat deposition differed between body regions (p=0.0005) with android region visceral adipose tissue increasing the most (+29% at end bed-rest), followed by remainder of the trunk (from chin to the iliac crest; +10%) and the arms and legs (both +7%). Insulin sensitivity reduced in the inactive subjects at the end of bed-rest (p=0.036). Resistive exercise alone (RE) did not have a significant impact on regional fat mass changes (p=0.055). In the resistance exercise plus whole-body vibration (RVE) group, increases in visceral adipose tissue (-14%; p=0.028 versus inactive subjects) and in the arms (arms -8%, p=0.011 versus inactive) were not seen.

Conclusions: We conclude that strict physical inactivity leads to a preferential increase in visceral adipose tissue. Exercise during inactivity can modulate this response.
Food Insecurity and Obesity in the U.S. – Flip Sides of the Same Malnutrition Coin

Joel Berg

1. New York City Coalition Against Hunger, New York, NY, United States

Even though the U.S. is arguably the wealthiest country in world history, food insecurity ravages 49 million Americans – including nearly 17 million children, according to the U.S. Department of Agriculture. That equals one in seven Americans and one in five U.S. children. Caused by soaring inequality and the gutting of the government safety net, this often-overlooked mass epidemic harms health, hampers educations, traps families in poverty, and eviscerates hope, while sapping the U.S. economy of $167.5 billion annually, according to the Center for American Progress. Yet, according to the U.S. Center for Disease Control, more than one-third of U.S. adults (35.7%) and approximately 17% (or 13 million) of children and adolescents aged 2—19 years are obese. Some incorrectly believe that the existence of widespread obesity proves that U.S. hunger doesn’t truly exist. Yet, not only are Americans frequently both obese and food insecure simultaneously, hunger actually is a key contributor to the growing obesity problem among low-income Americans. Hunger and obesity are flip sides of the same malnutrition coin. When people are on a limited budget, the easiest way to fill their stomachs is to purchase high-carbohydrate, high-fat, high-sodium foods that are cheaper to buy but more likely to cause obesity. Add to that the reality that most nutritious types of food aren’t even available in many low-income U.S. neighborhoods and you have a recipe for dietary failure. While many elites believe that the chief reason low-income people don’t eat more healthfully is that they is that they voluntarily choose to eat badly, the primary reason is that they simply can’t afford to eat differently. I will argue that fixing the economy and ensuring an adequate government nutrition safety will do far more to reduce hunger and obesity than would merely encouraging families to change their behaviors.

Why New York City’s Attempt to Ban Soda Fizzled

Joel Berg

1. New York City Coalition Against Hunger, New York, NY, United States

Seeking to combat obesity, then-New York City Mayor Michael Bloomberg proposed two ways to limit the consumption of soda and certain other sugar-flavored beverages. First, he sought permission from the federal government to eliminate the ability of low-income participants in the federal Supplemental Nutrition Distance program (SNAP), formerly known as the Food Stamp Program, to use program benefits to obtain certain sugar-flavored beverages. I was the leading public opponent of this effort. The federal government rejected this request. Second, he sought to use unilateral executive authority to limit the portion sizes of certain types of sugar flavored beverages sold by certain food service venues. This attempt was struck down by U.S. courts as an abuse of executive authority. While both efforts were thwarted due to legal reasons, I also argue that they represented bad public policy and counter-productive public health measures. I argue that they were patronizing, hypocritical, and class-biased. Moreover, I argue that — because they demonized one type of product rather than helping communities and families revamp their overall food environments and change their entire lifestyles— even if they had been implemented, they would have failed to reduce obesity. Instead, I argue for comprehensive, structural, measures to enable communities and families to exercise more and afford and consume a wide range of healthier foods.

A qualitative study of maternal views on preschoolers’ dietary self-regulation and feeding strategies

Heidi J Bergmeier, Helen Skouteris

Research shows comparisons between reported and observed maternal feeding practices have not always been associated. Whilst it appears that maternal reports may not reflect feeding practices performed during mealtimes, it is also possible mothers may use covert methods to guide the socialization of their children’s eating and weight. This qualitative study aimed to explore mothers’ views on their preschool children’s ability to self-regulate their eating and feeding strategies used, in order to provide further context to positive feeding practices and beliefs that may not be captured by quantitative or observational methods alone. Semi-structured telephone interviews were conducted with 23 mothers of preschool-aged children, who had previously completed feeding questionnaires and participated in two home-based mealtimes observation set approximately 12-months apart. Data were recorded, transcribed and themes extracted using grounded theory. Mothers who recognized how growth spurts, illness and times of the day meals were served influenced fluctuations in children’s appetite reported feeling more confident in their child’s ability to self-regulate their food intake and were less likely to use covert strategies to control feeding practices. Mothers who believed their child needed help regulating their intake of novelty food (e.g., sweets; ice-cream) used health reasoning and limit setting strategies. Covert strategies used to foster positive mealtime interactions and healthy eating included involving children in the preparation of food, avoiding engaging in battles over food, only offering healthy food choices and keeping less nutritious food out of sight. Findings indicate that mothers may largely guide preschoolers eating by controlling the family food environment, rather than directly pressurizing or restricting their child’s eating. This result may help to explain why previous assessments of reported and observed maternal feeding practices for this sample were not significantly associated.

Assessing the effectiveness of a lifestyle weight loss intervention on an obese outpatient population in New South Wales

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Obesity is a major public health and socioeconomic burden. Outpatient obesity clinics are an essential resource for obese individuals to access lifestyle advice for weight loss management. The objective of the study was to determine the effectiveness of an outpatient obesity clinic in achieving weight loss outcomes based on dietary and exercise interventions. Data from 276 obese adults admitted to a multidisciplinary weight management clinic were retrospectively obtained. Changes in anthropometry, body composition and blood pressure from baseline to 12-months were statistically analysed. Treatment groups consisted of two dietary interventions (general dietary advice and very low calorie diet (VLCD)), in addition to an exercise intervention group. Linear mixed-effects models showed that general dietary advice for males produced statistically significant reductions in body weight, body mass index (BMI), waist and hip circumference, per cent fat mass and systolic blood pressure (p<0.01), however changes in males on VLCD did not reach significance. Females on both dietary interventions showed statistically significant reductions in body weight, BMI, waist and hip circumference, (p<0.01) and general dietary advice significantly reduced per cent fat mass (p<0.001). Females on VLCD produced statistically better reductions in body weight, BMI and systolic blood pressure than those on general dietary advice. No effect of exercise physiologist intervention was observed in this study. Results from this study indicate a positive effect of outpatient obesity clinics in facilitating clinically significant weight loss.

Access to glucose-sweetened yoghurt or solution produces enlarged fat pads in the rat.

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Background and significance
In the context of the fructose controversy, we found previously that giving rats access to (fructose-free) maltodextrin produced similar metabolic consequences, including enlarged fat pads, to those produced by access to sucrose (Kendig, Lin, Beilharz, Rooney & Boakes, 2014). The present study addressed the question of whether glucose would also produce such effects.

Methodology
Experiment 1 contained three groups, each having unrestricted access to chow and water. The Glucose group were in addition given daily access to 30g of glucose-sweetened yoghurt over a period of 15 weeks; the Saccharin group were given identical access to 0.3% saccharin-sweetened yoghurt; and the Control group were given only unsweetened yoghurt. Experiment 2 contained a Glucose group given unrestricted access to 10% glucose solution for 4 weeks and a Saccharin group given 0.3% saccharin solution for the same period. Again, these drinks were in addition to unrestricted chow and water.

Results
Although no group differences in body weight were detected in either experiment, in Experiment 1 the Glucose group was found to have larger fat pads than in the other two groups that did not differ from each other. This difference in overall fat pad mass arose mainly from greater visceral fat in the Glucose group. In Experiment 2 at cull there was a marginal trend for visceral fat to be greater in the Glucose group.

Conclusion
Consumption of rapidly absorbed carbohydrates can produce larger fat pads, with or without changes in total body mass. Importantly this increased adiposity is independent of whether the carbohydrates contain fructose or not.

The effectiveness of whole-of-community interventions by socioeconomic position

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Introduction: The increasing prevalence of obesity world-wide has prompted its prevention as a priority. A common approach to obesity
Long term skeletal changes following different types of bariatric surgery

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Although bariatric surgery is the most effective weight loss therapy, its musculoskeletal consequences are unclear. Some surgical procedures result in changes in gut hormones known to affect bone health. This study examined bone and body composition together with gut hormones (PYY, GLP1) and adiponectin following bariatric surgery. We present preliminary 24 mth data from 56 obese patients undergoing Diet (n=18), Gastric Banding (GB) (n=10), Gastric Sleeve (GS) (n=21) and Roux-en-Y gastric bypass (RYGB) (n=7).

At 12 months weight change [kg (±SD)] was small in Diet group -5(6), greater in GB -16 (12) and GS -33 (13) and greatest in RYGB -39 (12) P<0.0001. Surgical groups experienced significant bone loss with highest total hip (TH) bone loss for RYGB -8.2 (4) %, followed by GS -5.2 (4) %, GB -1.6 (1.3) %, P <0.0001. Only RYGB group experienced LS bone loss of -5.4 (4) % p=0.0009.

Between 12 and 24 months, despite weight stabilisation or weight regain in all groups, TH bone loss continued reaching -14 (3) % for RYGB and -7 (5) % for GS with no further loss for GB and Diet. There was no further fat mass loss in any surgical group beyond 12 months, however lean mass loss continued in RYGB and GS although non significantly. Adiponectin levels remained significantly raised from baseline at 12 and 24m for RYGB and GS (p<0.0001) and for GB (p=0.025), while at 24 months fasting PYY hormone increased only in RYGB (p=0.04) and decreased in GS (p=0.009) with no change in GB and Diet.

Importantly, participants maintained normal levels of calcium, vitamin D and PTH levels through the study follow-up.

Different weight loss modalities resulted in varied skeletal responses. At 2 years, bone loss was marked in RYGB and GS but absent in GB despite significant weight loss. The musculoskeletal changes associated with RYGB and GS may involve changes in PYY and adiponectin, unrelated to weight loss alone.
A review of Australian Adult Obesity Research Funding

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Introduction: Obesity is a serious public health concern in Australia. The aim of this review was to determine the total and proportion of funding allocated by major health and medical research bodies for adult obesity management research from 2009 to 2014.

Methods: Publically available grant outcomes (projects/programs and people support) from the National Health and Medical Research Council and Australian Research Council were accessed and reviewed for the funding periods 2009-2014. For ARC the search was limited to those grants with Medical and Health Science FOR codes. Searches were conducted based on title and summary (if available) of the successful applications. Key words included: overweight, obese, obesity, weight, physical activity, sedentary behaviour, exercise, food, nutrition and diet. Grants with a primary focus on adults and health conditions directly associated with obesity (e.g. key modifiable risk factor) were included (i.e. CVD, diabetes). Grants related to infants/children/adolescents or animals or that did not clearly stipulate adults were excluded.

Major findings: For NHMRC it was found that 24 projects / development grants and 12 fellowships ($41 179 720) were funded, equating to 1% of total available NHMRC funding. For ARC there was inadequate information for ARC fellowships available to permit classification for this project. For ARC discovery projects with the included FOR codes a total of three projects were identified, accounting for approximately 9% ($760,540) of total available funding that was allocated.

Conclusion: Only a small proportion of federal funds were allocated to obesity research from 2009-2014 despite this major public health concern being specifically aligned to National Research Priorities.

Whanau Pakari: Eating behaviours of obese children and adolescents in Taranaki

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Limited data exist regarding eating behaviours of obese children in New Zealand.

AIM: To assess nutritional characteristics at Whanau Pakari baseline assessments, and compare with national data.

METHOD: Referral criteria were BMI>98th centile, or >91st centile with significant weight-related co-morbidities, age 5-16 years. Assessments included 24 hour food recall, modified Children's Dietary Questionnaire1, and knowledge of healthy food.

RESULTS: 240 assessments were analysed. Primary ethnicity was Maori for 109 (45%), New Zealand European (NZE) for 109 (45%), Pacific for 6 (3%), Asian for 6 (3%) and other for 10 (4%). Average age was 10 years, and 53% were female. Average meal duration was 14 minutes (range 2-60). 62% of participants (n=148) were described as “comfort eaters”. The average number of breakfasts eaten per week was 5.6 (range 0-7). Only 66% (n=160) ate breakfast every day of the week (vs. 87% of 2-14 year olds nationally)2. Maori ate fewer breakfasts per week than NZE (5.3 vs. 5.9, p=0.01). Children living in the most deprived 20% of households ate fewer breakfasts per week than those living in the least deprived 20% of households (5.3 vs. 6.3, p=0.05).3 Both of these findings reflected national data.2 Of the 240 baseline records, average fruit and vegetable servings per day were 1.8 and 1.7 respectively (both range 0-5). Only 56% (n=134) consumed the recommended ≥2 fruit servings/day (vs. 68% nationally), and 21% (n=51) consumed the recommended ≥3 servings of vegetables/day (vs. 40% nationally).4 Daily number of fruit servings did not differ between Maori and NZE (1.9 vs. 1.8, p=0.44). Daily number of vegetable servings were lower (1.6 vs. 1.9 respectively, p=0.015) and daily sweet drink intake was higher (376ml vs. 195ml, p=0.0003) for Maori compared with NZE.

CONCLUSION: The low consumption of fruit and vegetables, skipping of breakfasts, and ethnic differences in dietary habits amongst New Zealand children and adolescents needs to be addressed.

3. University of Otago, School of Medicine & Health Science. NZ Deprivation Index 2006 [Internet]. https://koordinates.com/layer/1066-nz-deprivation-index-2006/

The effect of changes to the school food environment on eating behaviours and/or body weight in children; a systematic review.

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Introduction
Supermarkets attract 63% of all food spending in Australia. Supermarkets stock and sell healthy food options as well as energy-dense, nutrient poor foods and drinks. This study aimed to compare the content of catalogues from four Australian supermarket chains with the Australian Guide to Healthy Eating (AGTHE).

Methods
The contents of the weekly national catalogues produced by four major Australian supermarket retailers (combined share of all supermarket grocery spending = 92.3%) was audited from June-September 2013 (11 weeks). Catalogues were sourced from store websites. The percentage of all advertised food products in the following categories was calculated based on the AGTHE: 1) The five core food groups: “Eat a wide variety daily” (Fruit/Vegetables/Grains/Meat and alternatives/Milk products and alternatives); 2) Discretionary foods: to be only eaten “sometimes and in small amounts” (including ice-cream, soft drinks, confectionery, pies, pastries, fats, oils). Food not able to be easily classified in one of these categories (i.e. products with ingredients from multiple categories) were included in a third group labelled “other”.

Results
Of all foods advertised in the catalogues, 26.4% were from the five core food groups, while 33.4% were discretionary foods. The remaining 40.1% of foods did not fall into the two defined categories. The percentage of advertised foods recommended to be eaten daily varied from 20.5% to 32.0% across the four chains, while the percentage of “sometimes foods” varied from 22.9% to 39.8%. Little variation was observed across the 11 weeks of the study, particularly for the two dominant chains.

Conclusion
Australian supermarket catalogues contain a high percentage of advertisements for discretionary foods and therefore appear to encourage unhealthy eating and obesity. Promoting healthier foods in supermarket catalogues could be a novel intervention strategy to improve population eating behaviours.

A New Model of Weight Loss Clinic in General Practice Using Multidisciplinary Approach in Group Sessions

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Background: Obesity is a major and increasing problem in Australia, despite many strategies in place to prevent and reverse it. We developed a new model of weight loss clinic in general practice that uses multidisciplinary approach in group sessions.

Method: Patients of two general practices were recruited via waiting room pamphlets; referral by GPs within the clinic; invitation letter sent to patient ≥18 years old and BMI≥30kg/m² or prescribed Phentermine within the previous 12 months. Twelve 8-week programs were conducted by a team comprising a GP, practice nurse, lifestyle adviser, dietitian, exercise physiologist and psychologist. Patients learn to identify and establish key health habits in a series of weekly educational meetings. Eating and physical activity behaviours were recorded in a diary and patients attended weekly consultation with the GP where their progress was monitored by measurement with bioelectrical impedance scales. Clinic reminders and motivational text messages were sent between meetings. The program was funded without out-of-pocket cost to participants by bulk billing under Medicare item numbers and by donation of allied health professional time.

Results: Between October 2011 and July 2014, 278 patients were completed twelve 8-week weight loss programs. Their median age was 47 years (range from 18-75) and the majority (84%) were female. At baseline, median BMI was 34.4kg/m² (range 23.7-63.9), body weight 92.7kg (60.3-169.9), estimated body fat percentage 42% (25-58) and waist circumference 105 cm (74-153). Median changes from baseline of BMI, weight (kg), estimated body fat (%) and waist circumference (cm) were (-0.7,-2.1.6,-4) at 8 weeks and (-1.1,-2.6,-2.2,-4) at 6 months accordingly. At 8 week evaluation, a large proportion was able to reach their goals, including weight loss (63%) and establishing new behaviours (84%).

Discussion: The decreases in weight, body fat and waist circumference achieved via our multidisciplinary group clinic model are encouraging. The longer term efficacy and generalisability of this model deserves further study, and we are following up all groups.
Avatars to assist health behaviour change
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Research on anthropomorphization of health coaches, and efficacy of these relative to standard wellness applications. An overview of design approaches to artificial intelligence health coaches, and the impact on relationship formation, persuasion, and behavioral change.

Contributions of local-area fast-food availability and area-based weight and dietary norms to 10-year change in cardiometabolic risk
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Background: Efforts to reduce cardiometabolic disease often target individual-level risk factors. However, individual dietary behaviour and body mass index (BMI) may be influenced by the geographic patterning of food sources and local-area norms. Norms figure prominently in socio-behavioural theories yet spatial variations in norms have rarely been investigated in predicting individual health outcomes. This study assessed the contributions of fast-food availability and local-area norms for dietary behaviour and BMI to 10-year change in cardiometabolic risk.

Methods: Cardiometabolic risk, expressed using a validated continuous clinical index, was calculated using data from a population-based biomedical cohort in Adelaide, South Australia over three waves of follow up, 2000-2010. Local-area exposures were defined for participants \( n=2228 \) using 1600m road-network buffers. Local-area norms (proportion residents with BMI \( \geq 25 \) kg/m\(^2\) or not meeting fruit intake of \( \geq 2 \) serves/day) were aggregated from individual-level self-reported data from a state-wide surveillance system, pooled across 2006-2010 for the study area. Fast-food availability (count of outlets) was extracted from a retail database. Separate multilevel models each featuring one local-area norm with fast-food availability as predictors of 10-year change in cardiometabolic risk were adjusted for area-level socioeconomic status and individual-level covariates.

Results: In separate models including fast-food availability, greater local-area proportion of residents with BMI \( \geq 25 \) kg/m\(^2\) or not meeting fruit intake of \( \geq 2 \) serves/day predicted worsening cardiometabolic risk across 10-years of follow up. Fast-food availability was not related to cardiometabolic risk. There was no evidence of interaction effects between local-area exposures.

Conclusions: Local-area norms (prevalence of unhealthful BMI and fruit consumption) reflect compositional population characteristics. Fast-food availability reflects built environmental context. In this study, only compositional norms, not fast-food context, predicted 10-year worsening of cardiometabolic risk. The implication of this longitudinal investigation is that the targeting of compositional norms might be more important than the targeting of fast-food context.

Report Card on progress in Obesity
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Since the first obesity management service in Australian Hospitals was started, it must be said much has improved, and we have all noticed a great change in general attitude and approach to the problem. Things have really come on in some areas but have continued to slide in others (marks are given below (and it should be noted that F does mean failure)). Because of the difficulties in the area it has been good to see that many have and are rallying round to help the poorer subjects.

There have been some setbacks over the years, but in many ways vast improvements have been made and it is good to see the strides taken.

Prevalence
- Adults F
- Children D
Prevention B
Management B-
Health Workforce C-
Public Health C+
Nutrition C
Activity B
General Understanding?
Outcomes
- Short term A
- Medium term B
- Long term B (things have really improved recently)

It is good to see the efforts being made and the improved results over the last few years. In summary, there have been improvements, there is a lot to do, but it has been fun, hasn't it?

**Whanau Pakari: a multi-disciplinary intervention for obese children and adolescents - improved accessibility for Maori, but clear health disparities.**

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Whanau Pakari is a unique intervention programme for obese children and adolescents that targets Maori, given their over-representation in obesity statistics.

Aim: To identify the disparities between Maori and New Zealand European (NZE) obese children and adolescents.

Method: Baseline assessments from January 2012 to August 2014 were reviewed. Referral criteria were BMI>98th centile, or >91st centile with significant weight-related co-morbidities, age 5-16 years.

Results: A total of 240 baseline assessments were analysed. 45% identified Maori as their primary ethnicity (n=109), 45% identified as NZE (n=109), 3% Pacific Island (n=6), 3% Asian (n=6), and 4% identified as Other (n=10). Average age was 10 years, 53% were female. The Maori participation rate was favourable compared with the previous programme available in the region (participation of 39%).

There was a significant difference between BMI standard deviation score (SDS) on entry to the programme for Maori (3.2, n=109) compared with NZE (3.0, n=109, p=0.02). Average BMI for Maori participants accompanying adult was significantly higher than NZE (34.6, n=104 vs. 32.6, n=105, p=0.005).

There was a significant difference between family history of Type 2 Diabetes for Maori patients compared with NZE (30%, n=73 vs. 24%, n=68, p=0.003). Acanthosis nigricans was more common in Maori (26%, n=63) compared with NZE (9%, n=21, p<0.001) however no difference was detected with regard to average fasting insulin levels (Maori 175pmol/L vs. NZE 129pmol/L, reference range 10-80, p=0.13), HbA1c (35 vs 34 mmol/mol), or fasting glucose (5.3 vs 5.2 mmol/L respectively).

Conclusion: Obesity and complications of obesity are more prevalent in Maori tamariki and their whanau than in NZ European children and their families. Maori have a higher BMI SDS than NZ European on entry and the same is reflected in their family member’s BMI. Given the strong familial predisposition to Type 2 Diabetes and insulin resistance, these results are of particular concern.


**Dietary calcium, diary intakes and childhood overweight/obesity in Chinese children and adolescents: a cross-sectional study**

*Yanrong Chen, Ruonan Duan, Hongmei Xue, Yan Liu, Guo Cheng*

Background Evidence of associations between dietary calcium, diary intakes and childhood overweight/obesity were limited, especially in China. Our aims were to investigate the prevalence of overweight/obesity among children and adolescents aged 7-15 years in Chengdu, China and to explore whether dietary calcium, diary intakes were associated with overweight/obesity among Chinese children and adolescents.

Methods 1,738 children and adolescents aged 7-15 years were recruited in a cross-sectional study using cluster random sampling method. Information on dietary calcium and dairy intakes was collected using 24-hour dietary recall and a food frequency questionnaire. Height, weight and waist circumference were measured to calculate body mass index (BMI), body mass index standard deviation (BMI SDS) and waist-to-height ratio (WHtR). Overweight/obesity was defined based on the sex-age-specific BMI criteria of Working Group on Obesity in China (WGOC). Participants were grouped into 3 categories indicating lower, moderate and higher intakes of dietary calcium and dairy intakes, respectively. The associations between consumption of dietary calcium, dairy and BMI SDS, WHtR and the prevalence of overweight/obesity were analyzed among different age groups (7-9, 10-12, 13-15 y).

Results The prevalences of overweight/obesity in boys and girls were 11.92%/7.04% and 8.04%/6.30%, respectively. Among boys aged 7-9 years, those with higher consumption of dairy had the highest BMI SDS (p=0.01). Among boys aged 10-12 years, those with higher consumption of dietary calcium had the lowest prevalence of overweight (p=0.02). Among boys aged 13-15 years, those with moderate dietary calcium intake had the highest WHtR (p=0.02). However, similar results were not observed among girls.

Conclusion Dietary calcium and dairy intakes seemed to be related to overweight/obesity in boys, but the associations were inconsistent among different age groups. Associations between consumption of calcium, dairy and overweight/obesity were not found among girls.
One-year longitudinal obesity trends of rural Australian adolescents: preliminary results from the ARCHER study

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Background: Puberty is critical life-stage where significant physical and behavioural changes occur and long-term health pathways are established. Overweight and obesity during adolescence is common and often persists, potentially affecting health trajectories into adulthood. Despite the dynamic changes occurring at this life-stage, there are limited longitudinal studies that examine weight and health trends across puberty. ARCHER (Adolescent Rural Cohort Hormones, Health, Education, Environments and Relationships) is an ongoing longitudinal study of rural-dwelling young adolescents exploring the influence of puberty hormone change on health and wellbeing over three years.

Methods: At baseline and annually, adolescents and one parent-guardian complete questionnaires that collect demographic, behavioural, social, psychological and mental health information. Adolescent anthropometry and body composition are also measured, with a fasting blood sample collected. Adolescents provide three-monthly urine samples for measurement of puberty hormones. Data: mean±SD.

Results: A total of 342 adolescents (55% male; 11% Indigenous) were recruited across western New South Wales, with 313 available for anthropometry at the year one time-point. Baseline age, BMI z-score and waist circumference were 11.8±1.0y (male: 11.8±1.0y; female: 11.7±1.0y), 0.55±1.21 (male: 0.51±1.20; female: 0.60±1.23) and 66.3±11.0cm (male: 65.9±11.5cm; female: 66.7±10.3cm) respectively. Over one year, mean change in BMI z-score was -0.02±0.36 (male: -0.03±0.36; female: 0.00±0.35) with overweight/obesity prevalence increasing from 32% (17% male) to 34% (18% male). Of those starting at healthy weight, 7% (3% male) became overweight at year one, and one boy showed a shift from overweight to obesity. Conversely, 16% (11% male) of adolescents who were overweight/obese at baseline had shifted into a lower z-score category. There was no significant change in BMI z-scores (p=0.45) or z-score categories (p=0.77) across the two time points.

Conclusion: Whilst overweight and obesity did not change significantly across the first year of the ARCHER study, it was a prevalent issue in this group. Ongoing collection and analysis of data from this cohort may uncover potential predictors of weight change and health trajectories across adolescence.

Trends in childhood obesity prevalence according to socioeconomic position: A systematic review

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Obesity is a significant public health issue and is socially patterned, with greater prevalence of obesity observed in the most socioeconomically disadvantaged groups. Recent evidence suggests that the prevalence of childhood obesity is levelling off in many countries, however this may not be the case across all socioeconomic strata. We are conducting a systematic review to examine whether trends in child and adolescent obesity prevalence since 1990 differ according to socioeconomic position in developed countries, and to determine whether recently observed levelling in obesity prevalence in children and adolescents has occurred across all socioeconomic groups. Search terms include relevant medical subject headings and keywords in the title, abstract and text for terms including overweight, obesity, socioeconomic position, children and developed countries. Articles that report on child or adolescent obesity prevalence recorded at two or more time points since 1990 and by at least one indicator of socioeconomic position will be included. Analysis will examine trends in childhood obesity prevalence since 1990 according to socioeconomic position. Quality of included articles will be assessed for internal and external validity against criteria adapted from the Effective Public Health Practice Project. Results of the review indicate that socioeconomic disparities in childhood obesity trends are evident and that the current reporting of the recent plateau in obesity prevalence masks important differences across the socioeconomic strata. These findings suggest that efforts to reduce obesity in children and adolescents are not equally effective, and children from lower socioeconomic backgrounds are being left behind.

Obesity paradox among type 2 diabetes: Link between obesity and chronic kidney disease

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Background: Obesity has been linked to chronic kidney disease (CKD) in the general population, but little is known about the association of
Evaluating a complex systems based approach to obesity prevention

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The developing evaluation framework for Healthy Together Victoria, a complex systems based approach to chronic disease prevention with a focus on obesity, is described. Measurement approaches of both the intervention side and the population impact side components of the Healthy Together Victoria evaluation are illustrated. This includes how multi-method measures are organised and aggregated into a policy meaningful framework.

This framework provides the basis of the synthesis phase of the plan for the analysis of the data, that reflects the systemic context from which the measures are taken. The context and drivers for the approaches taken to the evaluation design are outlined. How the challenges posed by attempting to collectively evaluate multi-site, multi-component and multi-level interventions implemented in real-world complex community systems to create the conditions for measurable and detectable population-level impact are discussed. Applying complexity theory to inform evaluation design of interventions implemented into real-world community systems to inform policy impact is currently a major area of inquiry and development in the field of evaluation. This is an applied example about how this has been approached in a multi-site community systems-based approach to tackle obesity.

What do the NHMRC and DAA guidelines tell us about the best dietary approach for weight loss?

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Background: Revised guidelines have been published on dietary approaches for weight management. The aim is to present current evidence for successful dietary approaches for weight loss and maintenance of lost weight and provide guidance in selecting appropriate dietary interventions for weight management.

Method: Recent evidence based clinical guidelines were reviewed in terms of the recommendations made for dietary advice in weight control.

Results: Systematic reviews indicate that a variety of dietary strategies can facilitate weight loss, so long as they achieve an energy restriction. Approaches include different ratios of protein, fat and carbohydrate; macronutrient type; or use of meal replacements monitored by health professionals. Combining dietary interventions with behavioural therapy and support can enhance short and medium term weight loss. Lower evidence levels support setting an energy restriction of ≥2.0MJ/day below maintenance energy requirements, use of low carbohydrate diets (≤20 to <30g/day with gradual increases) without a prescriptive energy restriction for 6-weeks to 6-months but not from 1-5 years. The use of low energy diets (~4.2-5.0MJ/d) with or without use of meal replacements is equally effective. At low energy intakes, monitoring of nutrient intakes is important as individuals may require multivitamins and/or minerals to optimise intake. Accredited Practising Dietitians are qualified to assess, diagnose and treat individual nutrition problems and support maintenance of dietary behaviour change.

Conclusion: Evidence based dietary advice for weight loss supports energy restriction as the key element of successful approaches. A variety of dietary strategies can be used based on individual preference, health status, past dieting history and reasons for attempting weight loss. To facilitate long-term weight loss maintenance specific strategies are needed. Further evidence is required to identify approaches to achieve long-term energy intake reduction and evaluation of approaches to support behaviour change during weight loss maintenance.

Motivators and barriers to engaging in healthy eating and physical activity in young adult men

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The relationship between overweight, obesity and cognitive function in adults: a systematic review and meta-analysis

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Emerging evidence suggests that obesity may be detrimental to cognitive function.¹,²,³ A systematic review and meta-analysis was undertaken to evaluate differences in cognitive performance between overweight/obese (BMI >25.0 kgm⁻²) and healthy-weight (BMI 18.5-24.9 kgm⁻²) adults. A systematic search conducted according to PRISMA guidelines across six databases netted 39,335 potential manuscripts with 17 included for review. The studies were relatively recent with all but one published in the last ten years. The overall sample (n=2,027) were predominantly middle-aged (mean age 39.5 years, range 18-92), with a relatively equal distribution of healthy-weight (n=1118) and overweight/obese (n=909) participants, although there was underrepresentation of males (26%). The array of psychometric tests administered (n=30) represented three cognitive domains: executive function, memory and information processing speed. Standardised Mean Differences (SMD, Hedges’ g) were combined and a pooled estimate of the effect of BMI category (healthy weight versus overweight/obese) on psychometric test scores was calculated using a random-effects model. Meta-analyses revealed small but significant effect sizes for executive function (SMD: -0.355; p<0.001) and memory (SMD: -0.265; p<0.05) and a non-significant effect for processing speed (SMD: -0.245; p>0.05). The results of the systematic review and meta-analysis support a negative association with cognitive function in overweight/obese adults, particularly in the executive function domain. Negative associations were found for memory and processing speed, although results were less consistent. Mechanisms underpinning lower cognitive performance in overweight/obese adults are unclear but co-morbidities including systemic inflammation and metabolic dysfunction may be contributing factors. The clinical implications of these findings and how these influence immediate and longer term daily cognitive function warrants further investigation.


BAT in the Dark Ages: a biological context for the Renaissance

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A review of eating and food-related difficulties for young people in out-of-home care and their possible association with unhealthy weight gain

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Background: Although childhood abuse has been associated with a number of adverse outcomes, research is now emerging which suggests it may play a role in subsequent development of obesity. Consequently, identifying potential mechanisms by which childhood abuse increases risk for obesity is essential. One possible explanation is that problematic eating and food-related behaviours (i.e., stealing/hoarding food, emotional eating, binge eating,) might mediate the association between adverse childhood experiences and obesity. Given young people placed in out-of-home care (OoHC) are: (1) typically removed from their families due to instances of abuse and/or neglect, and (2) experience poorer educational and health outcomes (including high rates of overweight/obesity) than their same-aged peers in the general community, they represent a high risk population group. Hence, the aim of this paper was to review eating and food-related difficulties for young people in care and their possible association with overweight/obesity.

Method: A search was conducted in January 2014 via: Academic Search Complete, CINAHL—with Full Text, Global Health, Medline, Social Work Abstracts, and PsycINFO. This paper was written as a narrative review.

Results: Seven studies were deemed relevant for the current review. Whilst this area of research is still in its infancy, the findings of this review suggest that young people residing in OoHC are at increased risk of problematic eating behaviours. Only two studies have examined whether patterns of problematic eating contribute to weight gain in this population. Although neither study found a positive association, each had limitations which may have impacted their findings.

Conclusions: It is clear that future research should focus on identifying whether patterns of problematic eating can explain the relationship between childhood abuse and subsequent weight gain. The findings of research evaluating these factors can then be used to better inform intervention strategies designed to address problematic eating and prevent excessive weight gain amongst young people living in OoHC.

Pyloric motility and energy intake responses to intraduodenal fat in lean, overweight and obese humans

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Background: Human obesity is strongly linked to high-fat diet (HFD) consumption. Evidence from animal studies shows an attenuation of the appetite suppressive effects of fat following a HFD, and in modelled obesity, Gastrointestinal (GI) responses to fat in obese humans are inconsistently reported, potentially due to differences in habitual fat and energy intake (EI) of study participants. Here, we compared the effects of intraduodenal (ID) fat infusion on pyloric motility (an important determinant of EI) and subsequent ad libitum EI in lean, overweight and obese humans, and examined relationships with habitual dietary fat and EI.

Methods: The effects of ID fat infusion (2 kcal/min for 120 min) on isolated pyloric pressure waves (IPPWs) were assessed in fasted lean (L: BMI: 21.5 ± 0.5 kg.m⁻², n = 18), overweight (OW: BMI: 26.8 ± 0.4 kg.m⁻², n = 13) and obese (OB: BMI: 34.2 ± 1.5 kg.m⁻², n = 9) healthy volunteers. Ad libitum EI (buffet lunch) was quantified immediately thereafter. Habitual dietary fat and EIls were assessed using 3 x 24-hour recall diaries. Data are presented as mean ± SEM.

Results: Habitual EI (KJ): L: 8740 ± 784; OW: 8372 ± 538; OB: 8387 ± 1241) and the percentage of energy consumed as fat (L: 34 ± 2;
How low do you need to go? Carbohydrate restriction for appetite suppression during low energy diets in overweight and obese adults: a sub-study of the PREVIEW Study Australia

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Background: Ketogenic very low energy diets (VLED) providing 1,900-3,340 kJ (450-800 kcal) and 50-80 g of carbohydrate per day are recognised clinically for promoting weight loss with concomitant appetite suppression in overweight and obese adults. However, this level of carbohydrate restriction excludes many nutrient-rich foods from the diet, notably dairy, fruit and some vegetables. It is not known the extent to which dietary carbohydrate intake must be restricted in order to achieve appetite suppression. We aimed to determine whether a moderately low carbohydrate diet (104 g per day) results in appetite suppression during weight loss.

Methods: In this clinical trial (NCT02030249), 70 overweight and obese pre-diabetic men and women, 25-70 years of age with a body mass index (BMI) ≥ 25 kg/m², received a moderately low carbohydrate (104 g per day), low energy diet (3,390 kJ or 810 kcal per day) for 8 weeks. The low energy dietary formulation was supplemented with 3-4 servings of skim milk and 300 g of non-starchy vegetables per day. Body weight and fasting appetite (measured using visual analogue scales) were determined at baseline (week 0) and at week 8. Changes between baseline and week 8 were compared using repeated measures ANOVA, adjusting for baseline scores.

Results: Mean body weight was significantly reduced by the 8-week intervention (-11.6 ± 2.5 kg, p < 0.001). At week 8, fasting hunger was significantly decreased compared to baseline (-8.3 ± 3.2 mm, p < 0.05), and fasting scores for desire to eat, prospective food consumption and fullness were unchanged from baseline.

Conclusions: A moderately low carbohydrate low energy diet providing 104 g carbohydrate per day, rich in low fat dairy, does not preclude the hunger suppression that has been reported for ketogenic VLEDs that provide only 50-80 g carbohydrate per day.
Abstract: Obesity represents a global public health issue. Research has generally found that migration is linked to weight change, with immigrants typically gaining weight post-migration. While this appears to be connected to change in migrant health behavior due to acculturation, there are also indicators of environmental influences. At present there is no research assessing the link between migrant weight change and environmental factors linked to obesity. Few studies investigate whether any such association is moderated by the given migrant population’s specific characteristics. The present study examines the interaction between obesity-related environmental factors and the pattern of migrant acculturation in a sample of 152 Iranian immigrants in Victoria, Australia. Weight measurements, demographics, physical activity levels and diet habits were also surveyed. Results showed that pattern of acculturation was not related to body mass index. However, it was linked to the participants’ perception and use of the Australian environment. Assimilated participants were inclined to engage the Australian environment as one conducive to physical activity and health. Ultimately, it was found that the physical environment contributes to the relationship between the pattern of acculturation and obesity in migrant populations. On this basis, suggestions for modifications to the migrant obesity theoretical model are considered.

Keywords: Acculturation; obesity; physical environment; immigration; health; Iranians.

Growing healthy: A week by week, m-health intervention for parents of infants 0-9 months

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Background
Infant feeding practices, including breastfeeding, best practice bottle feeding, age of introduction of solids and diet quality are important in affecting healthy weight gain in infancy and later in childhood and adulthood. Indigenous children and those from low socio-economic backgrounds have significantly higher rates of obesity, making early intervention a priority in these groups. One emerging and promising area involves providing support for healthy parenting through electronic media such as the Internet or smart phones (m-Health interventions). Such approaches are yet to be tested in the area of child obesity prevention.

Methods
The Growing Healthy program is a new app, website and online forum providing parents with a ‘one-stop shop’ for trustworthy advice and tips on infant feeding in the first 9 months of life. The aim of the program is to:

- promote breastfeeding and best practice bottle feeding
- delay the introduction of solids to around 6 months
- promote healthy first foods/appropriate transition to family foods
- promote healthy infant feeding practices

Parents will receive 2-3 messages a week relevant to the age of their baby with links to more information on the app/site. The development of the program has been informed by literature reviews as well as interviews and focus groups with parents and PHC staff. The program will be piloted with 150-200 parents across three PHC settings: 1) maternal and child health services in Victoria 2) general practices in NSW 3) an Indigenous health service and will be evaluated for: the feasibility of referring parents to the program and reinforcing key messages as part of routine baby health checks and the effectiveness of the program in terms of reach, use, acceptability, cost and impact on key infant nutrition and feeding outcomes?

Significance
This study will provide important new information about the feasibility and effectiveness of a novel m-Health intervention delivered through primary health care on nutrition and obesity risk in low socio-economic status and indigenous families.

Food marketing with movie character toys: effects on young children’s preferences for healthy and unhealthy fast food meals

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Background: Movie tie-in premiums are a pervasive method of targeting children with fast-food advertising. Such approaches are yet to be tested in the area of child obesity prevention.

Methods: Experimental design whereby approximately 800 students in grades 1 and 2 from Melbourne metropolitan primary schools will be randomly assigned to one of four conditions: (i) unhealthy vs. healthy meal (control – no premiums); (ii) unhealthy vs. healthy meal (both with premium); (iii) unhealthy meal (with premium) vs. healthy meal (without premium); (iv) unhealthy meal (without premium) vs. healthy meal (with premium). All participants will initially be shown a short promotional trailer for a current children’s movie followed by an advertisement for a McDonald’s Happy Meal associated with the same movie (Conditions 2-4) or an advertisement for a children’s leisure meal (with premium); (i) unhealthy meal vs. healthy meal (control – no premiums); (ii) unhealthy meal (both with premium); (iii) unhealthy meal (with premium) vs. healthy meal (without premium); (iv) unhealthy meal (without premium) vs. healthy meal (with premium). Results will be available for presentation. For the analyses, logistic regression will be used to test whether the proportion of students choosing the unhealthy meal over the healthy meal varies as a function of the inclusion of a movie tie-in premium. ANOVA will be used to test mean differences in ratings of the unhealthy and healthy meals by condition.

Conclusion: Results will inform a potential regulatory model whereby movie tie-in premiums would not be permitted to accompany unhealthy fast-food meals and/or the potential for premiums to only be permitted to accompany healthy fast-food meals.
Beyond lifestyle and obesity: Understanding 21st Century determinants of chronic disease

John Dixon¹

1. Baker IDI Heart & Diabetes Institute, Melbourne, Vic, Australia

Content to be provided shortly.

Introduction

Obese individuals are frequently reported to have reduced quality of life (QoL) compared to healthy lean individuals. Yet the variability in self-reported quality of life among different obese age groups has rarely been examined. We examined the effects of age on self-reported QoL.

Methods

Data was pooled from numerous studies where participants had completed the Short Form-36 at baseline, to yield cross-sectional data from 1673 obese individuals (BMI 30.0–59.9 kg/m²; age 14–71 years). Participants were divided into quintiles by age and one-way ANOVA performed to examine differences in the eight domains and the Mental and Physical Component Summary scores (MCS and PCS). We were particularly interested in the younger age range, so all adolescents (14–18 yrs, n=81) were gender- and BMI-matched to participants in their 20s and 30s for a sub-analysis of the perceived QoL in these age groups.

Results

The mean PCS and MCS for the whole cohort were below community norms (50.0) at 38.7 and 46.3 respectively. With increasing age, Physical Function and Bodily Pain worsened significantly. However the MCS actually improved with age (Q1: 44.5, vs Q5: 48.7), indicating older obese people had a more positive outlook than younger participants. This was not influenced by BMI, which was equivalent across quintiles (mean BMI range: 42.0–43.7 kg/m²). Adolescents scored significantly better on all domains than those in their 20s or 30s, with those in their 20s reporting the poorest QoL. The pattern was particularly strong in the Physical Function, Social Functioning, Mental Health and Role Emotional domains.

Conclusion

Our findings suggest that obese adolescents may actually be quite resilient to their condition, while obese young adults appear to have poorer self-reported QoL than either adolescents or older adults. In addition to other priority age-groups for obesity management (maternal and childhood), young adults with obesity should be prioritised for support.

The “Obesity Paradox” – it’s time to change the paradigm of ideal body weight

John Dixon¹

1. Baker IDI Heart & Diabetes Institute, Melbourne, Vic, Australia

Hypothesis: The ideal weight range, adjusted for height, in adults that is associated with the lowest mortality risk is not constant and varies with age, ethnicity and state of health.

Discussion: When Body Mass Index (BMI) was introduced to replace ideal body weight in the late 1970s, Andres concluded that the relationship between BMI and mortality was U-shaped AND the BMI nadir for mortality increased with age. But such findings challenged the beautiful simple hypothesis that lower BMI is better, and so Andres’ caution was unheard or dismissed.

Over the last decade however, there has been an exponential rise in the reporting of apparently paradoxical findings in the relationship between BMI and mortality. The obesity paradox refers to observations that being overweight or even mildly obese may provide mortality advantage when compared with ‘normal’ weight individuals under a range of human conditions. Yet until recently, the majority of obesity researchers have been reluctant to support any paradox, believing that the observations arose from epidemiological biases. So where are we today?

There are now abundant data indicating that ethnicity, age and chronic disease alter the BMI-mortality relationship and there are many biologically plausible reasons for the observations. Further driving the need to rethink our definitions of ‘ideal BMI’ is the paucity of any clear evidence that weight loss reduces mortality in people in the overweight and class I obese ranges, as the only convincing evidence comes from bariatric surgery populations (BMI>35). There is no ‘obesity paradox’ to explain if we can let go of the biologically implausible concept that a single ideal weight range fits all. Perhaps lifestyle advice should focus less on intentional weight loss, which is difficult to achieve, and more on quality nutrition, physical activity, fitness and maintaining function in chronic disease states and with aging.
Cross-sectional association between eating behaviors and body composition among children and adolescents in South China

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1. West China School of Public Health, Sichuan University, Chengdu, China
2. West China School of Public Health, Sichuan University, Chengdu, China
3. West China School of Public Health, Sichuan University, Chengdu, China

Background
The impact of eating behaviors on the body composition among Chinese children and adolescents has not been extensively studied. Our aim was to examine whether the eating behaviors among Chinese children and adolescents were associated with their body composition.

Methods
2,109 children and adolescents (52.0% boys) aged 6-17 years were cross-sectionally recruited in South China. Data regarding eating behaviors (i.e., eating breakfast regularly, having dinner with their parents regularly, and having snacks) were collected by a self-reported questionnaire. Height, weight and skinfold thickness were measured to calculate body mass index (BMI), age- and gender-specific Z-scores of BMI (BMI z_score) and percent body fat (%BF). International Obesity Task Force (IOTF) criteria were used to define childhood overweight and obesity.

Results
There were no significant associations between eating behaviors and incidence of overweight/obesity among boys and girls. Girls who ate breakfast regularly (≥5 times per week) had lower %BF (p=0.0005) compared with breakfast skippers. Boys who reported eating breakfast regularly had higher BMI z_score (p=0.04) than those who did not. Moreover, having dinner with parents regularly correlated strongly with lower %BF (p < 0.0001) in girls and higher BMI z_score in boys (p=0.03). In girls, having snacks was negatively associated with %BF, while no association was found in boys.

Conclusion
Our data suggest that the beneficial impact of eating breakfast regularly and having dinner with parents on percent body fat appears to be more relevant for girls. Eating breakfast regularly, having dinner with parents and having snacks seem to be unbenefficial for body composition only in boys.

Obstetric and Gynaecologic care of women who are overweight or obese: A survey of practice.

Nicole Edge, Rosalie Grivell, Jodie Dodd

BACKGROUND
Overweight and obesity represent a significant health problem with Australian population data indicating that 44.4% of women ages 18-44 years are overweight or obese (Body Mass Index BMI ≥25kg/m²). Recent South Australian data indicates 50% of women entering pregnancy are overweight or obese. Increasing maternal BMI in pregnancy is associated with well-documented adverse pregnancy outcomes, both for women and their infants, including preeclampsia, gestational diabetes, macrosomia and perinatal death. Outside of pregnancy, overweight and obesity contribute significantly to poor female reproductive health, including reduced fertility, pelvic organ prolapse and endometrial hyperplasia or cancer. While there is considerable literature describing these associations, there is more limited information available how overweight and obesity impact on clinical care, and what modifications are being made by practitioners when caring for this group of women.

AIMS
To conduct a survey of practice of fellows and trainees of the Royal Australian and New Zealand College of Obstetricians and Gynaecologists evaluating current obstetric and gynaecologic care for women who are overweight or obese.

METHODS
An online or mail questionnaire was sent to 2,251 fellows and trainees of RANZCOG, utilising the college register, asking questions related to current care practices in obstetrics and gynaecology for women who are overweight or obese. Questions related to participant demographics, an estimation of the prevalence of overweight and obesity in their practice, and management practices when caring for women with an increased body mass index.

RESULTS
A total of 852 (37.9%) questionnaires were completed between March and June 2012. Practitioners indicated an increase in referrals and investigations for women who were overweight or obese. Interventions aimed at reducing possible complications were also recommended more frequently.

CONCLUSIONS
Practitioners report a high rate of compliance with currently available guidelines, thus making appropriate modifications to clinical care for this high risk group of women.

Investigation of the impact of degree of weight loss on physiological adaptations to weight loss

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Investigation of the impact of degree of weight loss on physiological adaptations to weight loss

Background
Obesity is a well-known health concern, with a high level of morbidity and a substantial economic burden. Previous research has demonstrated that weight loss is vigorously physiologically defended in obese subjects who lose weight, which is known to cause an almost universal regain of weight lost. What is not yet known is whether the degree of weight loss has an impact on these physiological adaptations.

Methods
To date, 44 subjects have been enrolled in the study, which is a dietary intervention trial in two phases. During the weight loss phase subjects are placed on a very low energy diet (VLED) program for 12 ± 4 weeks to achieve a 15% weight loss. At baseline, 5% weight loss, 10% weight loss and 15% weight loss circulating levels of leptin, ghrelin, peptide-YY, glucagon-like peptide 1, gastric inhibitory polypeptide and pancreatic polypeptide are examined, and anthropomorphic measurements are collected. The follow-up phase is a 24 month weight maintenance phase with quarterly anthropomorphic measurements and biannual blood sampling.

Results to date
To date, data analysis of 5 subjects who successfully achieved a 15% weight loss has been completed. Significant decreases in leptin (p<0.001) and amylin (p<0.001) concentrations were demonstrated at 5% reduction in weight, and were found to be proportional to percentage change in weight. No significant changes in peptide-YY, glucagon-like peptide 1, pancreatic polypeptide and gastrointestinal inhibitory polypeptide were demonstrated in response to weight loss using data from this pilot sample. Ghrelin results are not yet available.

Conclusion
Preliminary data suggests that weight defence mechanisms in obese subjects are proportional to degree of weight loss, and are triggered by even modest reductions in weight to the order of 5%. Further data is required to confirm this.

A pedagogy for Lifestyle Medicine
Garry Egger

1. Southern Cross University, Fairlight, NSW, Australia

A discipline of ‘Lifestyle Medicine’ has developed in several countries to manage lifestyle (and environmentally) related chronic diseases. However to date, the contribution of such a discipline remains unclear. There are two main components: the content, or epidemiology (science), which involves an understanding of the determinants of chronic diseases, and the processes (art), which include the clinical actions required to modify these. The former (ie. ‘causality’) is often multi-factorial but relatively well known. Processes however, have been largely overlooked, with the default being those used in conventional consultations. Yet such processes, developed in an acute disease era, are often unsuited to the more extensive requirements of chronic disease. The 1:1 consultation situation for example has limitations for both patient and provider. Shared Medical Appointments (SMAs) utilizing the advantages of peer support as well as multi-disciplinary input in an extended, non-repetitive consultation, provide one option for the delivery of lifestyle related prescription that is currently lacking in chronic disease management.

Improving health literacy for weight management in overweight or obese non-English speaking migrants in primary health care: A systematic review of quantitative and qualitative data
Nouhad El-Haddad
1, Nighat Faruqi1, Catherine Spooner1, Elizabeth Denney-Wilson2, Mark Harris1

1. Centre of Primary Health Care and Equity, UNSW, Australia
2. Centre for Midwifery, Child, and Family Health, University of Technology, Sydney, Australia

Objectives: Despite the need to develop effective strategies for improving health literacy for weight management in non-English speaking migrants, the evidence about the impact of ethnicity on health literacy remains poorly understood. This review sought to understand how ethnicity modifies the effect of interventions aimed at improving health literacy for weight management in non-English speaking migrants and whether these interventions impact on behavioural and physiological risk factors.

Design: We conducted a systematic review. Major electronic databases were searched using keywords in various combinations. Eligibility criteria included quantitative and qualitative studies, among non-English speaking adult migrants, who were overweight or obese, in primary health care.

Results: A total of 10 studies met the inclusion criteria (four quantitative and six qualitative studies) mostly with Hispanic population in the USA and none of high quality. The mean age of the participants was 45. BMI and indicators of social status, including income and education were not consistently reported in all the studies.

Conclusion: Interventions that are culturally adapted to their target group, incorporate both nutrition and physical activity education, and delivered by a multidisciplinary tea, were proven to be successful in improving health literacy and weight in overweight or obese non-English speaking migrants. It was difficult to tease out the effect of ethnicity on these interventions. Ethnicity was found to be a barrier and facilitator for improving health literacy for weight management by shaping beliefs, attitudes, and understanding around weight management in this group. More research is needed to develop evidence-based interventions to improve health literacy and weight in non-English speaking migrants.
Physical activity levels and cognition in older adults at risk of cognitive decline
Kathryn Ellis

Cognitive decline in older adults is common, with 1400 new cases of dementia diagnosed in Australia each week (Access Economics, 2009). Clinical groups at risk for cognitive decline are older adults with subjective member complaints (SMC) or Mild Cognitive Impairment (MCI). SMC are defined by concerns about deteriorating cognitive function without objective evidence of impairment on cognitive testing, whereas MCI requires both subjective concern and objective cognitive impairment. Observational studies suggest physical activity (PA) is associated with positive health outcomes, and a small number of randomised controlled trials (RCTs) have shown improvements in cognition following PA interventions (Lautenschlager et al. 2008). However, the mechanisms underlying positive cognitive effects of PA are not yet fully understood. Further, while national recommendations for PA for older Australians suggest 30 minutes of moderate-intensity aerobic activity a day, recent studies suggest that 83% of Australian’s aged 75 years and older do not achieve this recommended amount (ABS, 2011). This presentation overviews methodology and findings from two current PA RCTs in older adults at risk of cognitive decline; the AIBL active study and the INDIGO trial. AIBL active explores possible mechanisms underlying positive cognitive effects of PA. Specifically, we have recruited a cohort 108 of SMC and MCI individuals who have at least one risk factor for cardiovascular disease (CVD), to examine whether participants with SMC and MCI who are randomised to a 24-months PA program demonstrate less progression of CVD measured on MRI, less cognitive decline and depression, and better quality of life at 24 months than participants randomised to usual care. INDIGO is a novel trial exploring adherence to PA interventions, specifically examining whether a home-based 6-month PA intervention with individual goal-setting and volunteer mentors can significantly increase PA levels in sedentary older adults at increased risk of developing Alzheimer’s Disease.

The association between community awareness of obesity-related factors in cancer risk and obesity-related outcomes; changes from 2004-2012
Kerry A Ettridge, Jacqueline Bowden, Caroline Miller, Greg Sharplin, Carlene Wilson

Background and significance
Knowledge of obesity and overweight as a cancer risk factor remains at a moderate level in comparison to well known risk factors such as tobacco and sun damage; however, the extent to which knowledge of obesity and overweight as a cancer risk factor is associated with behavioural outcomes has not been commonly assessed or tracked over time.

Method
This study tracked community awareness of obesity-related risk factors for cancer and level of overweight and obesity from 2004-2012. Data from five South Australian cross-sectional representative population surveys with approximate sample sizes of n=3,000 were analysed (adjusted for age, gender and socio-economic disadvantage) at 2-year intervals from 2004-2012.

Main findings
While levels of unprompted awareness of maintaining a healthy weight as a cancer prevention strategy increased significantly over time (from 2004, 2006 and 2008 to 2012; OR=0.32-0.72, p<0.01), perceptions of being overweight as an important risk factor for cancer decreased significantly (from 2006, 2008 and 2010 to 2012; OR=1.32-1.76, p<0.001). Rates of overweight and obesity increased significantly from 2004 to 2012 (54% vs. 60%; p<0.001). A significant association between unprompted awareness of maintaining a healthy weight and level of overweight/obesity was found only in 2010 such that those who were in the overweight and obese range were more knowledgeable (OR=0.53, p<0.01). Conversely, a significant association was observed between prompt awareness of being overweight as an important risk factor for cancer and behaviour in 2010 (OR=0.85, p<0.05) and 2012 (OR=0.82; p<0.05) such that those in the overweight and obese range were less inclined to perceive overweight and obesity an important risk factor for cancer.

Conclusion
While the results indicate some degree of convergence between knowledge and behaviour in recent years, patterns differed according to assessment, i.e., unprompted awareness of maintaining a healthy weight vs. perceived relative importance of being overweight.

Better Management of Weight in General Practice – Study protocol
Nouhad Faruqi, Nigel Stocks, Elizabeth Denney-Wilson, Slaw-Teng Liaw, Catherine Spooner, Jane Lloyd, Rachel Laws, Nouhad El-Haddad, Oshana Hermiz, Mark Harris

In 2011–12, 25% of Australian adults were classified as obese (1). While it is prevalent in all Australian population groups, obesity is...
Healthy Together Geelong is one of 12 prevention areas under the Victorian State Government’s Healthy Together Victoria initiative which Chad Foulkes takes to deliver at scale One Local Government area, 180 health promoting schools, long day care and kindergartens - what it takes to deliver at scale

Chad Foulkes

1. City of Greater Geelong, Geelong, VIC, Australia

Healthy Together Geelong is one of 12 prevention areas under the Victorian State Government’s Healthy Together Victoria initiative which

Jamie’s Ministry of Food reduces take-away/fast food expenditure

Anna Flego1, Jessica Herbert1, Elizabeth Waters2, Lisa Gibbs2, Boyd Swinburn3, John Reynolds4, Marj Moodie1

1. Deakin Health Economics, Deakin University, Burwood, Victoria, Australia
2. Jack Brockhoff Child Health and Wellbeing Program, Melbourne School of Population Health, University of Melbourne, VIC, Australia
3. WHO Collaborating Centre for Obesity Prevention, Deakin University, Burwood, Victoria, Australia
4. Deakin Biostatistics Unit, Deakin University, Burwood, VIC, Australia

Introductory statement: A lack of cooking skills and cooking confidence has been associated with poor food choices and higher consumption of foods prepared outside of the home. Reduced opportunities to learn to cook have contributed to declining cooking skills; as a result, community-based cooking skills programs have proliferated, aiming to promote cooking skills and cooking confidence. Whilst Jamie’s Ministry of Food is the most well-known cooking skills program, it has not yet been formally evaluated. This study evaluates the immediate and sustained effectiveness of Jamie’s Ministry of Food in Australia on individuals’ cooking confidence and cooking/eating behaviours.

Methods:
The evaluation used a quasi-experimental repeated measures design. Adult participants who registered for the program from November 2011 - December 2013, were invited to participate. A questionnaire was administered at baseline (T1), immediately post program (T2) and 6 months post completion (T3) for participants allocated to the intervention group, while wait list controls completed it 10 weeks prior to program commencement (T1) and at program commencement (T2). A linear mixed model approach was used to determine mean differences within and between groups over time.

Major findings:
Intervention group assessment completion: 694 (T1), 383 (T1 + T2), 214 (T1, T2 + T3); control group: 237 (T1) and 149 (T1 + T2). Statistically significant increases within the intervention group (p<0.001) and significant group*time interaction effects (p<0.001) were found in all cooking confidence measures between T1 and T2 as well as cooking from basic ingredients, frequency of eating vegetables with the main meal and daily vegetable intake (0.52 serves/day increase). Statistically significant increases at T2 were sustained at T3 in the intervention group.

Concluding Statement:
Jamie’s Ministry of Food improved participants’ cooking confidence and cooking/eating behaviours and is a promising population strategy to influence healthy eating.

One Local Government area, 180 health promoting schools, long day care and kindergartens - what it takes to deliver at scale

Chad Foulkes

1. City of Greater Geelong, Geelong, VIC, Australia

Healthy Together Geelong is one of 12 prevention areas under the Victorian State Government’s Healthy Together Victoria initiative which

The intervention involves clinical audit and screening patients for health literacy with practice feedback meetings; interactive training of GPs and PNs; and a PN visit for health check and referral to community-based lifestyle modification weight loss programs with telephone follow up.

Data will be collected from health professional and patient surveys and interviews, clinical audits and GP and PN visits at baseline, 6 and 12 months. The primary outcomes are PN self-reported behaviour and confidence in patient assessment and providing advice and referral; patient self-reported receipt of assessment, advice and referral and attendance at the referral programs; and patient health literacy related to weight loss.

The study will provide information on the effectiveness of PN navigation support for obese patients with low health literacy in general practice.


Whilst Jamie’s Ministry of Food is the most well-known cooking skills program, it has not yet been formally evaluated. This study evaluates the immediate and sustained effectiveness of Jamie’s Ministry of Food in Australia on individuals’ cooking confidence and cooking/eating behaviours.

Methods:
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Concluding Statement:
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35
is a $100m cluster randomised trial of a novel, ‘whole-of-system’ intervention which has as one of its aims to halt and reverse rising trends in childhood obesity. The trial is a world first, at scale attempt to apply and evaluate complexity and systems thinking approaches to primary prevention of chronic disease including childhood obesity and its determinants.

Healthy Together Geelong has been tasked with assisting 95% of the 180 long day care centres, kindergartens, primary and secondary schools to work through a State-wide Achievement Program to create healthy environments for learning. The Victorian Health Promotion Achievement Program is based on the WHO health promoting schools framework. Participants receive guidelines, resources and ongoing support to help meet state-wide benchmarks for health promotion. The WHO system building blocks of leadership, partnerships, financing, workforce development and information underpin the wider systems intervention. This presentation focuses on approaches utilising the WHO system building blocks to deliver the Achievement Program at scale in a local government.

To date 79 or the 89 early learning centres and kindergartens; 36 of 65 primary schools and 10 of 25 secondary schools are registered. These involved settings cover over 50% of the 53,100 0-18 year olds in the City of Greater Geelong local government area.

2. Everybody business : strengthening health systems to improve health outcomes : WHO’s framework for action.
   http://www.who.int/healthsystems/strategy/everybodys_business.pdf

67 workplaces, 26,690 employees and we are a quarter of the way there: Delivering health promoting workplaces at scale as part of a systems intervention

Chad Foulkes

1. City of Greater Geelong, Geelong, VIC, Australia

Healthy Together Geelong is one of 12 prevention areas under the Victorian State Government’s Healthy Together Victoria initiative which is a $100m cluster randomised trial of a novel, ‘whole-of-system’ intervention which has as one of its aims to halt and reverse rising trends in adulthood obesity. The trial is a world first, at scale attempt to apply and evaluate complexity and systems thinking approaches to primary prevention of chronic disease including childhood obesity and its determinants.

Healthy Together Geelong has been tasked with assisting 75% of businesses with 20 or more staff in the Local Government area of the City of Greater Geelong to work through a State-wide Achievement Program to create healthy environments for employees. The Victorian Health Promotion Achievement Program is based on the WHO health promoting workplaces framework. Participants receive guidelines, resources and ongoing support to help meet state-wide benchmarks for health promotion.

The WHO system building blocks of leadership, partnerships, financing, workforce development and information underpin the wider systems intervention. This presentation focuses on approaches utilising the WHO system building blocks to deliver the Achievement Program in workplaces at scale in a local government.

To date 67 of the >250 businesses are registered and 14 of them have progressed through the first stage. Businesses involved include insurance brokers, transport companies, University, TAFE, hospitals, health services, a local government, the Traffic Accident Commission, State Government Departments, hardware stores, the AFL club the Geelong Cats and more. There are 101,039 people in the labor force in the City of Greater Geelong local government area. Businesses involved in the Achievement Program to date employ over 27,000 staff.

2. Everybody business : strengthening health systems to improve health outcomes : WHO’s framework for action.
   http://www.who.int/healthsystems/strategy/everybodys_business.pdf

Lessons from Healthy Together Geelong: Delivering systems change at scale across two levels of government

Chad Foulkes

1. City of Greater Geelong, Geelong, VIC, Australia

Healthy Together Geelong is one of 12 prevention areas under the Victorian State Government’s Healthy Together Victoria initiative which is a $100m cluster randomised trial of a novel, ‘whole-of-system’ intervention which has as one of its aims to halt and reverse rising trends in adulthood obesity. The trial is a world first, at scale attempt to apply and evaluate complexity and systems thinking approaches to primary prevention of chronic disease including obesity and its determinants.

Healthy Together Geelong operates out of the City of Greater Geelong local government authority in partnership with Barwon Health and Bellarine Community Health. Over ¾ million people live in the City of Greater Geelong. The Council area is home to Victoria’s second largest city and is a major regional hub for leisure, work and services.

The Victorian State Government Department of Health has tasked Healthy Together Communities of which Geelong is one with a) assisting 75% of businesses with 20 or more staff a State-wide Achievement Program to create healthy environments b) assisting 95% of the 180 long day care centres, kindergartens, primary and secondary schools to work through a State-wide Achievement Program to create healthy environments c) reducing rates of unhealthy weight across the population, reducing smoking prevalence, increasing serves of fruit and vegetables and increasing physical activity d) bringing about systems change to improve the lives of people where they live, learn, work and play through impacting on the many determinants of health that local government control and/or influence.

This presentation move beyond talk of scaling up obesity prevention initiatives and presents examples of what works and lessons for delivering at scale in a systems intervention.

2. Everybody business : strengthening health systems to improve health outcomes : WHO’s framework for action.
   http://www.who.int/healthsystems/strategy/everybodys_business.pdf
Systems interventions to halt and reverse rising trends in obesity what theories, methodologies and methods actually aid practice: Cases from Healthy Together Geelong

Chad Foulkes

1. City of Greater Geelong, Geelong, VIC, Australia

Healthy Together Geelong is one of 12 prevention areas under the Victorian State Government’s Healthy Together Victoria initiative which is a $100m cluster randomised trial of a novel, ‘whole-of-system’ intervention to halt and reverse rising trends in adulthood obesity.

Healthy Together Geelong operates out of the City of Greater Geelong local government authority in partnership with Barwon Health and Bellarine Community Health.

The purpose of this presentation is to illustrate a number of systemic changes of how a local government has and is reorienting its’ services and planning functions to address determinants of health to improve people’s lives where they live, learn, work and play.

1. Victorian Local Governments are required by an Act of State Parliament to produce and review a Municipal Public Health and Wellbeing Plan. One of the six Action Guides within the City of Greater Geelong plan is titled ‘Improving how we do business in health and wellbeing’. It focusses on leadership, governance and distributing the responsibilities for health across the organisation

2. At the Lara swimming pool kiosk we undertook a menu assessment and 98% of food was in the ‘red’ category we altered the menu to only have green and amber food. Results showed:

a. 86% of customers stating they were happy with the healthy menu
b. 72% less saturated fat was sold compared to the previous season
c. 45% less energy or kilojoules was sold compared to the previous season
d. The healthy options only canteen returned a financial surplus

3. We worked with Engineering services to reformulate their schools traffic planning approach to cater for walking and riding

4. We are bringing a range of health planning techniques and data to the development of Council’s social infrastructure plan and open space strategy

Systemic change to business practices initiated by health planners can lead to increased health promoting environments and settings without recourse to the ongoing involvement of health planners.

The Parents’ Jury Healthy Checkouts Campaign

Dimity Gannon, Alice Pryor, Angela Mallon

1. The Parents’ Jury, Melbourne, VIC, Australia

Intro

In the fight against childhood obesity parents play a pivotal role however, it is clear that everyday environments either assist or impede parents in making healthy choices for their children and family.

This snapshot study focuses on retail environments and explores the impact on parents of placement of confectionary and sugar sweetened beverages at checkouts.

Children have a significant influence on the purchasing decisions of families; pressuring parents to buy highly processed, unhealthy foods through pester power that is fuelled by junk food marketing to children.

Major retailers pay lip service to caring about the health of their consumers i.e. Woolworth ‘the fresh food people’, but their healthy eating messages are undermined by junk food being targeted directly at children and families in store.

Methods

The Parents’ Jury conducted an online survey of parents to ascertain their experiences at supermarket checkouts and predict future consumer behaviour in the event that healthy checkouts are introduced by one or more retailers.

Findings

- The snap shot study found that 90% of parents had been pestered to buy unhealthy foods at checkouts
- 77% of parents would prefer to shop in a store where all checkouts are free from confectionery and sugary drinks
- 63% of parents told us they would switch to a similar shop nearby if it provided junk free checkouts

Conclusion

The results formed the basis of an advocacy campaign directed at Australian retailers calling for 50% of all checkouts to be confectionary and sugar sweetened beverage free.

The strong response from parents against confectionary and sugar sweetened beverages at the checkout and their willingness to change their consumer behaviour by switching stores sends a powerful message to retailers that a healthy change is needed at the checkout.

The good, the bad and the ugly; intermittent fasting and severe energy restriction in adolescents

Sarah Garnett, Megan Gow, Kerryn Chisholm, Shirley Alexander, Louise Bau

1. The Childrens Hospital at Westmead, Westmead, NSW, Australia
Adolescent obesity is associated with both short and long term complications including type 2 diabetes, related comorbidities and premature mortality. Lifestyle modification is the first line of treatment. However, which is the best diet remains unclear. Emerging evidence indicates that the primary objective of dietary interventions should be to reduce the total energy intake and the most successful diet will be the one that the patient will adhere. Current recommendations involve moderate daily energy restriction. Yet several studies, including our recent randomised control trial, RESIST, indicate that some young people struggle to benefit from this type of diet. Alternative options are required.

We are currently investigating the use of severe energy restriction (very low energy diets; VLED) and intermittent fasting, in obese adolescents. The VLED are targeted at adolescents at high risk of, or have been diagnosed with type 2 diabetes. Current treatment of type 2 diabetes is generally management of hyperinsulinemia and hyperglycaemia. However, in adults the abnormalities underlying type 2 diabetes, including normalising insulin secretion have been reversed by short term use of a VLED; changes which can be maintained up to 18 months even after some weight regain. The VLED diet is tough; yet this approach has the potential to reverse type 2 diabetes and provides an alternative to pharmacological therapies and surgical options. Intermittent fasting incorporates ‘fasting’ days (~25% energy requirements) and ‘feeding’ days and has been popularised by the 5:2 diet. Short term studies in adults indicate that intermittent ‘fasting’ is as effective in decreasing body weight as daily energy restriction and may be superior in preserving fat free mass and improving metabolic profile. Preliminary findings from our research and clinical experience with these diets will be presented.

The osteoblast: An important player in glucocorticoid-induced brown fat lipid accumulation

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Glucocorticoids (GC) negatively affect brown adipose tissue function, which may contribute to GC-induced metabolic dysfunction. We have recently demonstrated that some of the adverse metabolic outcomes of GCs are mediated via the osteoblast (JCI 2012\textsuperscript{1}). The present study aimed to evaluate the contribution of osteoblastic GC-signaling in GC-induced brown adipose tissue dysfunction. We used a transgenic (tg) mouse model in which GC-signaling had been selectively disrupted in osteoblasts and osteocytes via targeted overexpression of the GC-inactivating enzyme, 11ß-HSD2. Eight-week-old tg mice and their wild-type (wt) littermates were subcutaneously implanted with pellets containing either 1.5mg corticosterone or placebo for 4 weeks. At endpoint, white intra-abdominal fat pads and the inter-scapular brown fat pad were assessed.

Compared to respective placebo-treated controls (wt+pic/tg+pic), treatment of wt mice with corticosterone (wt+GC) resulted in a substantial increase in both white and brown adipose tissue mass, while in treated tg mice (tg+GC) only marginal changes in fat pad mass were observed (White fat: wt+GC:+0.9g vs. tg+GC:+0.4g, p<0.001; Brown fat: wt+GC:+0.31g vs. tg+GC:+0.18g, p<0.001). Histology revealed that treatment of wt mice with corticosterone increased lipid deposits in the brown fat, giving it the appearance of white adipose with large, lipid filled adipocytes rather than the small and dense multilocular adipocytes typical of brown fat. This effect was markedly attenuated in GC-treated tg mice, which displayed significantly lower fat accumulation and smaller lipid droplets than their wt counterparts (lipid area: wt+GC:51% vs. tg+GC:36%, p=0.005; lipid droplet size: wt+GC:1160μm\textsuperscript{2} vs. tg+GC:574μm\textsuperscript{2}, p<0.001). Moreover, upon immunohistochemical assessment no UCP1 positive cells were apparent in wt+GC brown fat, whereas tg+GC mice displayed abundant positive staining, evidence for the protection of thermogenic potential in tg+GC mice.

Our findings demonstrate that the actions of high-dose GCs on the osteoblast play a hitherto unknown role in the adverse effects of GC treatment on brown adipose tissue in mice.


The role of dietary and physical activity behaviours in educational differences in weight gain among Australian adults – the Melbourne Collaborative Cohort Study

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Rationale
There has been no analysis to date of the behavioural factors associated with differences in weight gain across socioeconomic strata. Determination of these factors is important for informing public policy that can reduce socioeconomic inequalities in obesity.

Methodologies
We utilised the 21,479 participants from the Melbourne Collaborative Cohort Study who attended the baseline (1990-1994) and follow-up (2003-2007) surveys, of Australian or Northern European country of birth and were not missing data on education, anthropometric or behavioural factors of interest. We further selected the 5,026 men and 8,671 women who had gained or maintained weight over time (follow up weight ≥ baseline weight). A series of linear regression models were used in accordance with the products of coefficients method to analyse the mediating role of leisure time physical activity, alcohol, soft drink (regular and diet), snacks, savoury items and fruit and vegetable consumption on the relationship between education and body mass index (BMI) at follow-up (adjusted for baseline BMI, representing BMI change). All models were stratified by sex and adjusted for age and smoking status.

Major findings
Total population mean baseline age was 53, and 43% of these 13,697 persons were of low education. Men showed no significant
Patterns of Sedentary Behaviour and Physical Activity Before and Three Months After Bariatric Surgery

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Background: Obesity is often associated with low physical activity (PA) levels. There is a paucity of research on objectively measured PA in obese adults undergoing bariatric surgery. This study aimed to compare patterns of sedentary behaviour (SB) and PA in obese adults before and three months after bariatric surgery.

The role of GPs in preventing excessive gestational weight gain among obese women early in pregnancy

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Background: Gestational weight gain (GWG) interventions early in pregnancy are an important part of a comprehensive approach to addressing maternal obesity. Given that General Practitioners (GPs) are most likely to confirm pregnancies and to provide early antenatal care, understanding their role in managing maternal obesity is an important first step in designing interventions for GPs that assist them in providing support and preventive care to their obese patients.

Aims: 1) To determine how GPs perceive their role in managing maternal obesity; 2) To explore GPs experiences in managing maternal obesity and GWG; 3) To explore possible intervention components that would help GPs to manage maternal obesity.

Methods: A semi-structured interview was designed to address the three aims of the study. GPs participating in shared antenatal care in the Perth metropolitan area were invited to participate. Data from the semi-structured interview were analysed using thematic analysis.

Results: Fifteen GPs completed an individual interview. In discussing how GPs perceive their role in managing maternal obesity and minimising GWG, all respondents agreed that GPs have a key role. Despite this, most GPs recognised that they lacked the skills and confidence. On the topic of current experiences in managing maternal obesity, two themes were identified: 1) variation in the scope, timing, and effectiveness of discussing the risks of maternal obesity; and 2) barriers to managing GWG in a GP setting (e.g. skills and time). In discussing components of an intervention, GPs suggested incorporating training, as well as practical strategies and information on GWG and weight management.

Conclusions: GPs acknowledged that they have a vital role to play in the management of maternal obesity and GWG, however, their current practice and skills varied widely. This study suggests supporting GPs to deliver a GWG intervention is essential to managing maternal obesity in the primary care setting.

Do ketogenic diets really suppress appetite? A systematic review and meta-analysis

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Very low energy diets (VLEDs) and ketogenic low carbohydrate diets (KLCDs) are two dietary strategies that have been associated with a suppression of appetite. However, the results of clinical trials investigating the effect of ketogenic diets on appetite are inconsistent. To evaluate quantitatively the effect of ketogenic diets on subjective appetite ratings we conducted a systematic literature search and meta-analysis of studies that assessed appetite with visual analogue scales before (in energy balance), and during (while in ketosis) adherence to a VLED or a KLCD. Individuals were less hungry and exhibited greater fullness / satiety whilst adhering to a VLED, and individuals adhering to a KLCD were less hungry and had a reduced desire to eat. While these absolute changes in appetite were small, they occurred within the context of energy restriction, which is known to increase appetite in obese people. Thus, the clinical benefit of a ketogenic diet is in preventing an increase in appetite, despite weight loss, although individuals may indeed feel slightly less hungry (or more full or satisfied). This, rather than the absence of hunger altogether, can help individuals to comply with a restriction of energy intake in order to achieve weight loss.
Methods: Nineteen obese adults (12 females; aged 44 ± 10 years) wore two PA monitors (SenseWear ArmBand [SWA] and Stepwatch Activity Monitor [SAM]), for 7 consecutive days, before (pre) and three months after bariatric surgery (post). Using SWA data, Metabolic Equivalent of Tasks (METs) was used to partition waking hours as time in SB (<1.5 METs), light (1.5 to 3 METs), moderate (3 to 6 METs) or vigorous intensity PA (>6 METs). Daily step count was measured with the SAM.

Findings: Compared with measures collected prior to surgery, three months following surgery, participants weighed less (97 ± 18 vs. 115 ± 19 kg; p < 0.001) and had a lower Body Mass Index (34 ± 6 vs. 40 ± 6 kg·m⁻²; p < 0.001). Following surgery, there were no changes in the proportion of waking hours spent in SB (pre 74 ± 11% vs. post 72 ± 12%; p = 0.40), light (pre 21 ± 9% vs. post 23 ± 11%; p = 0.26) or moderate intensity PA (pre 5 ± 3% vs. post 5 ± 3%; p = 0.82). In addition, there was no difference in the number of steps/day (pre 6927 ± 3606 steps vs. post 7481 ± 3433 steps; p = 0.47).

Conclusion: Both before and after bariatric surgery, obese adults spent most of their waking hours in SB. Despite considerable weight loss at three months following surgery, there were no differences in the patterns of SB and PA.

Barriers and Facilitators for Physical Activity in Adults before Bariatric Surgery

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Background: Obesity, which is a major health issue in Australia, is often associated with low levels of physical activity (PA). In combination, obesity and low PA contribute to the development and persistence of chronic health conditions, such as Type 2 diabetes mellitus, dyslipidemia, hypertension, obstructive sleep apnea, depression, cancer, asthma and degenerative joint problems. This study aimed to explore the perceived barriers and facilitators for PA in obese adults before bariatric surgery.

Methods: Nineteen obese adults (15 females; aged 42 ± 12 years, weight 119 ± 20 kg and Body Mass Index: 42 ± 7 kg·m⁻²) participated in a 1-1 interview before undergoing bariatric surgery. Participants were asked open-ended questions about the perceived barriers, facilitators and motivators for PA. Interviews were recorded and transcribed verbatim. Transcriptions were analysed using thematic analysis, a widely used method for qualitative data analysis, to provide a rich and detailed account of the data. To ensure the credibility of findings and interpretations, the themes were validated by a second member of the research team.

Findings: The main themes related to barriers to PA were perception of being overweight, the physical consequences of obesity (i.e. joint pain), lack of motivation, and self-presentation concerns (i.e. embarrassment due to body image). Key themes identified as facilitators were the idea of weight loss, social support and company to exercise. Participants discussed several different types of motivations to engage in PA, including weight control, enhanced body image, health benefits, and coping with stress.

Conclusion: The main perceived barriers for PA in obese adults were related to excess weight and its consequences. The perceived facilitators and motivators for PA were mainly related to extrinsic factors, with weight control more frequently reported than perceived health benefits of PA. These suggest a lack of intrinsic motivation factors, such as enjoyment of PA, in this population.

Effect of camel milk on plasma glucose concentration and lipid profile in streptozotocin-induced diabetic rats: Camel milk may better therapeutic potential for obese diabetic patients

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Obesity and overweight are well known risk factors for coronary artery disease (CAD), and are expected to be increasing in the Kingdom of Saudi Arabia (KSA). Elevated levels of total and low density lipoprotein (LDL) cholesterol and low levels of high density lipoprotein (HDL) cholesterol are important risk factors for coronary heart disease. Diabetes mellitus is a major risk factor for the development of cardiovascular complications and cardiovascular disease. Camel’s milk is a good source of various vitamins and minerals and is characterized for its low cholesterol and high concentration of insulin. Therefore, in this study was undertaken to investigate the effect of camel milk on plasma glucose and plasma and tissue lipid profiles in streptozotocin-induced diabetic rats. Diabetes was induced in adult male albino rats of the Wistar strain, weighing 180–200 g, by administration of streptozotocin (40 mg/kg of body weight) intraperitoneally. Rats were randomly divided into five groups. Group I: control animals (normal, nondiabetic animals), Group II: camel milk control, Group III: streptozotocin-diabetic, untreated animals; Groups IV: streptozotocin-diabetic animals given 250 mL/day camel milk, and Group V: streptozotocin-diabetic animals given glibenclamide (600 μg/kg body weight). The levels of total cholesterol, triglycerides, free fatty acids, and phospholipids, were assayed in the plasma besides lipoprotein-cholesterol (high density lipoprotein-cholesterol (HDL-C), low density lipoprotein- cholesterol (LDL-C) and very low density lipoprotein-cholesterol (VLDL-C)) and tissues (liver, kidney and heart). Total cholesterol, triglyceride, free fatty acid, and phospholipid (LDL-C and VLDL-C in plasma only) levels increased in plasma and tissues significantly, while plasma HDL- cholesterol significantly decreased in diabetic rats. Treatment with camel milk prevented the above changes and improved towards normalcy. Thus administration of camel milk is able to reduce hyperglycemia and hyperlipidemia related to the risk of diabetes mellitus and it may better therapeutic potential for obese diabetic patients.

Ameliorative effect of kaempferol a flavonoid against streptozotocin-generated oxidative stress
induced diabetic rats

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The aim of present study was designed to investigate the antioxidant potential of kaempferol in streptozotocin (STZ) induced diabetic rats and to study oxidative stress and antioxidant status. Diabetes was induced into adult male albino Wistar strain, weighing 180–200 g by a single intraperitoneal injection of streptozotocin (40 mg/kg of body weight (BW)). The diabetic rats exhibited increased plasma glucose and decreased insulin levels. Oral administration of kaempferol resulted in a significant reduction in plasma glucose, and an increase in serum insulin levels in comparison with diabetic control group. A significant increase in the levels of thiobarbituric acid reactive substances (TBARS), lipid hydroperoxides (LOOH) and conjugated dienes (CD) were observed in diabetic rat while treated with kaempferol the above lipid peroxidative markers were reverted to near normalcy. The level of non-enzymic antioxidants vitamin C, vitamin E and reduced glutathione (GSH) were significantly decreased in diabetic rats. Oral administration of kaempferol to diabetic rats shows that the levels of non-enzymatic antioxidants back towards the normal levels when compared to diabetic control rats. The activity of enzymatic antioxidants superoxide dismutase (SOD), catalase (CAT), glutathione peroxidase (GPx) and Glutathione-S-transferase (GST) were significantly decreased in diabetic rats and treatment with kaempferol the above enzymatic antioxidants activity were significantly increased. Kaempferol is having a good antioxidant property, as evidenced by increased antioxidant status and decreased lipid peroxidation, which protects the risk of diabetic complications.

Early weight loss in obese adolescents participating in a lifestyle intervention and weight loss at 24 months: The RESIST study

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Background

Lifestyle intervention is the first line treatment for paediatric obesity, yet the weight loss effects are variable. This study aimed to examine the association between early weight loss and outcomes at 24 months in obese adolescents with clinical features of insulin resistance participating in a 12-month lifestyle intervention with metformin.

Methods

Adolescents (n=111, 66 girls, age: 10 to 17 years) were participants in a randomized trial, the RESIST study, which examined the effects of two diets differing in macronutrient content on insulin sensitivity.\textsuperscript{1} Eighty-five completed the 12-month program and follow-up data at 24 months were available for 42 adolescents. Change in weight was determined by BMI expressed as percentage of the 95th centile (BM95).\textsuperscript{2}

Results

After 3 months intervention, 90 adolescents lost weight (median BM95 change -7, IQR: -9.7, -3.7), of which 45 adolescents lost ≥5% weight (BM95) and 7 adolescents lost ≥10%. More than half of the adolescents who lost ≥5% BM95 at 3 months, increased or maintained their weight loss at 12 months (62%) and 24 months (52%), respectively. In contrast, adolescents who did not lose weight at 3 months were more likely to have dropped out at 12 months (odds ratio 2.8[95%CI: 1.3 to 5.9], P=0.016) or were less likely to have lost weight during the 12 month intervention (OR 3.2 [95%CI 1.5 to 7.0], P=0.018), or at the 24 month follow-up (OR 2.8 [95%CI 1.8 to 4.3, P=0.005]. There was no statistical significant difference in weight outcomes between diets at any time point, nor did sex, baseline age, baseline BMI95 or index of insulin resistance predict weight loss at 12 and 24 months.

Conclusion

Early weight loss in obese adolescents may be used as an indicator to identify treatment nonresponders and intervention strategies could be modified to improve outcomes.


Group visits for chronic pain

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Currently in Australia approximately 3.2 million adults are living with persistent pain, with this number projected to increase to 5 million people by 2050 (MBF Foundation, 2007). This equates to one in five Australians, including adolescents and children. Almost one in five GP consultations involves a patient with persistent pain. (Blyth, 2001) (Sydney University, 2010).

Rates of depression are 20 percent higher among people with persistent pain compared to the rest of the population; and up to one in five suicides in Australia are related to physical health problems. (DoHA, 2006) (ABS, 2011). As a result, persistent pain costs Australia approximately $34.3 billion per annum.
Panorama Health Network’s Self Training Educative Pain Sessions (STEPS) program is an outcomes-based, multidisciplinary model aiming to improve the quality of healthcare delivered to patients with long term persistent pain. Participants attend a series of group education sessions over two days, which provides them with up to date, evidence-based education and expert advice regarding effective management strategies for persistent pain. This includes, but is not limited to:

- Movement, exercise and pacing everyday activities
- Relaxation response/mindfulness and coping strategies
- Medications
- Communicating effectively with health providers
- Efficient navigation of the health care system.

Each session is run by a multidisciplinary pain team, including a clinical psychologist, physiotherapist and a pain specialist. Four weeks following group education sessions clients meet one on one with each practitioner to devise an individually tailored Pain Management Plan. This plan is forwarded to the patient’s GP/referrer for implementation in the primary care setting. Panorama Health Network STEPS participants have recorded statistically significant improvements in depression, level of perceived control of pain, improved perception of pain, improved ability to cope with pain, increased social functioning, improved perception of general health and reduced fear of movement.

1. ABS 2011, 4841.0. Facts at your fingertips: Health: Characteristics of bodily pain in Australia.

Influence of carotenoids on oxidative damage, inflammation and [NAD(H)] in human cerebrospinal fluid with age

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Evidence indicates that oxidative stress and inflammation play a central role in the degenerative changes of systemic tissues in aging. However a comparatively limited amount of data is available to verify whether these processes also contribute to normal aging within the brain. In this study we quantified changes in [NAD(H)] and markers of inflammation and oxidative damage (F2-isoprostanes, 8-OHdG, total antioxidant capacity) in the cerebrospinal fluid (CSF) of healthy humans across a wide age range (24-91 years). The effect of plasma carotenoid concentrations, a group of dietary derived phytochemicals with potent antioxidant and anti-inflammatory properties, was also evaluated. CSF of participants aged >45 years contained increased levels of lipid peroxidation (F2-isoprostanes) (p=0.04) and inflammation (IL-6) (p=0.00) and decreased levels of both total antioxidant capacity (p=0.00) and NAD(H) (p=0.05), compared to their younger counterparts. After adjusting for age and gender, total antioxidant capacity correlated positively with both △-carotene (p=0.01) and △-carotene (p<0.001) in plasma. An inverse correlation was seen between plasma lycopene and the plasma inflammatory cytokine IL-6 (p=0.02). An increase in plasma △-cryptoxanthin correlated with a decrease in CSF IL-6 (p=0.04). A significant positive correlation was found between plasma lycopene and both plasma (p<0.001) and CSF (p<0.01) [NAD(H)]. Surprisingly no statistically significant associations were found between the most abundant carotenoids, lutein + zeaxanthin and markers of oxidative stress in the plasma or CSF. These data suggest a progressive age associated increase in oxidative damage, inflammation and reduced [NAD(H)] in the brain which may be moderated by the consumption of specific dietary carotenoids.

Getting taboo issues on the table: talking about overweight and obesity in New Zealand General Practice

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Background: The role of primary care thus far appears under supported and underutilised in obesity, in contrast to notable success relating to smoking cessation. General practitioners and primary care nurses report varying success in their interactions with patients regarding weight management and identify a lack of appropriate resources to apply opportunistically in consultations. This paper describes the development and pilot of a novel brief opportunistic intervention (TabOO: Talking about overweight and obesity).

Method: This was a three phase qualitative study: an existing corpus of recorded health interaction consultations were analysed; a opportunistic intervention for weight management was designed; the intervention was piloted to assess its practicality and acceptability for clinicians and patients in primary care.

Results: Video recordings of 183 medical consultations were reviewed for lifestyle and weight content. A subset of 38 recordings were selected for interational analysis. A further 20 consultations were recorded to assess acceptability of the intervention involving 16 general practice, 23 general practitioners, 7 primary care nurses, and 58 patients. Clinicians and patients were subsequently interviewed.

Discussion: Effective interational strategies were usually, but not always, related weight to the patient’s presenting clinical problem. This
paper will look at some of the interactional analysis examined through videos and transcripts to highlight the interactional delicacies observed across the phases of this study.

Conclusion: Primary care practitioners have a range of strategies available for raising the subject of weight reduction, but expressed a lack confidence in overall management of the topic. When practitioners receive appropriate support (in the form of brief training and information resources) they become more comfortable in offering support to patients, and patients are accepting of this level of intervention.


Lifestyle medicine and the management of pain

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The management of pain requires a comprehensive assessment of the patient's pain experience. This biopsychosocial management includes an assessment of lifestyle. There is general acceptance of this “whole person” approach to pain management and there is growing acceptance of the utility of lifestyle changes to perhaps down-regulate sensitised pain circuits. The pain patients I deal with are those suffering from musculoskeletal pain – which represents the bulk of the chronic pain burden. This presentation attempts to use specific examples and techniques to help the practitioner guide the patient towards a more healthy approach to life styles in order to help with management of pain states. Changes in lifestyle often involve re-framing of commonly accepted “truths” and thinking which might need challenging to help patients better management their pain.

Age specific changes in BMI and BMI distribution among Australian adults using cross-sectional surveys from 1980 to 2008

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Background: Research efforts globally have focused mainly on trends in obesity or overweight among populations, or changes in mean body mass index (BMI), without consideration of changes in BMI across the BMI spectrum.


Results: We found greater mean BMI increases in younger people, in those already overweight and in those with lower education. Between the 1980s and the early 2000s there was no evidence of a period effect in mean annual BMI gain among men (p=0.39) but a slowing down of annual BMI gain for older women (p<0.05). BMI change was not uniform across the BMI distribution, with different patterns by age and sex in different periods. For young adults there was greater BMI gain at higher BMI quantiles, thus adding to the increased right skew in BMI, whilst BMI gain for older adults was more even across the BMI distribution.

Conclusions: The synthetic cohort technique provided useful information from cross-sectional survey data and highlighted the importance of elucidating BMI changes across the entire BMI spectrum, as changes in mean BMI do not tell the full picture. The quantification of annual BMI change has contributed to understanding the epidemiology of obesity progression and identified key target groups for policy attention - young adults, the already overweight and those of lower socioeconomic status. The information may also be used in population models to project trajectories of BMI over time.

A holistic model for dealing with chronic pain

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Emerging neuroscience indicates that the experience of chronic pain relates more to nervous system sensitisation than structural change in the body. Traditional biomedical treatments such as medications and procedures are generally ineffective in reducing nervous system sensitisation and pain. Active self-management strategies have greater effectiveness. Neuroscience education, mindbody awareness, social connection, physical activity and nutrition play key roles in gradual pain reduction over time. This presentation will review relevant scientific evidence and recommend practical management approaches. The recent launch of novel educational videos via social media will be highlighted.
Supportive Sport Climate Increases Competence, Relatedness, Internalisation of Motivation, and Physical Activity in Overweight Children

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Introduction and Objectives Exercise motivation and maintenance is a key problem in overweight children and adolescents. Based on self-determination theory (Deci & Ryan, 2012), the study investigated how the sport climate (i.e., an autonomy-supportive vs. controlling coaching style) is associated with sport motivation, basic needs and physical activity (PA) in an exercise program for overweight children and adolescents (Fidelio).

Method Ninety-two overweight and obese (BMI SDS M = 2.03, SD = .53) children and adolescents (50 girls, mean age 10.89 years, SD = 1.39) participated in the study. In a quasi-experimental design, we examined changes in sport climate, basic psychological need satisfaction through sports and exercise, sport motivation and PA during the program (accelerometer, Actigraph). Furthermore, attendance, drop-out, weight (BMI SDS and body fat SDS via body fat analyzer scale, Tanita) and social-status were measured.

Results Participants of the Fidelio program overall show high rates of physical activity within the exercise program compared to Physical Education (PE) (Aelterman et al., 2012) (Moderate to Vigorous Physical Activity (MVPA) t(609) = 28.99, p< .001, Cohens’d = 1.87; Fidelio M_MVPA = 21 (46%) minutes, SD = 6; M_MVPA = 1872-2050). Results show significant correlations between sport climate and the basic need for competence (r = .328; p < .01) and relatedness, (r = .264; p < .05). However, sport climate is not associated with external regulated extrinsic motivation and amotivation but internalized forms of motivation (e.g. intrinsic motivation to experience stimulation, r = .402; p < .01). Significant correlations were also found between sport climate and physical activity (r = .357; p < .05).

Discussion Beyond effects of weight reduction through a sport program, our data suggest that the experienced degree of autonomy support from coaches has a positive effect on children’s motivation, basic needs and PA. Further research should address effects of autonomy supportive coaching styles for developing a healthy lifestyle in children and adolescents.


Weigh Forward: A clinical audit of weight management in Australian general practice

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Background Weigh Forward was an RACGP-accredited prospective audit that systematically reviewed the clinical performance of GP’s against best practice guidelines (NHMRC). These guidelines advocate multi-component lifestyle interventions first-line, with intensive pharmaceutical or dietary interventions introduced or referral provided if required.

Methods Weigh Forward assessed the effect of a 12-week structured education program for weight loss, delivered by GP’s and practice nurses, and followed for a further 12-weeks. Inclusion criteria were adult patients who had:
- BMI >30 kg/m2 or 25–29.9 kg/m2 with co-morbidities;
- been screened and considered ready to lose weight;
- been weight stable for ≥3 months; and
- baseline data available including comorbidities and biochemistry (including HbA1c, if diagnosed with diabetes).

Results Practitioners engaged 258 patients with retention of 185 (71%) through to 24-weeks. The primary cohort had a mean BMI of 36.4±0.4, M:F ratio of 68:190 and mean age of 48.1±0.9. The cohort averaged a weight loss of 5.9kg±0.7, with 51.7% of participants achieving a weight loss (WL) of >5%, and 27.2% achieving >10%WL. Patients on intensified treatments achieved >10%WL in 44.1% of cases, compared to 15.9% of those with lifestyle intervention only. Practitioners more frequently prescribed lifestyle interventions (61.2%) over intensive treatments (38.8%). 3.5% of patients were prescribed VLED’s, 34.8% Duramine, and 0.4% Orlistat, and 0% bariatric surgery. Patients with comorbidities were 1.82 (95%CI; 1.376, 2.430) times less likely to have treatment intensified, while those with diabetes had a 5.53 (95%CI; 2.030, 15.109) times lower chance. As a result, patients with diabetes achieved > 10% weight loss in only 8.0% of cases, compared to 31.1% among those without.

Conclusion It seems practitioners lack confidence to intensify treatment in patients with comorbidities despite there being no contraindications in most cases, and weight loss outcomes being significantly better in those treated more aggressively.
Disruption of glucocorticoid signaling in osteoblasts prevents age-associated metabolic dysfunction in mice

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The physiological ageing process is associated with changes in body composition and metabolism, including central obesity, diabetes and osteoporosis. The osteoblast has recently been identified as a mediator of GC-induced metabolic dysfunction in mice (1). We therefore hypothesised that a mechanistic link exists between increased GC signaling in the osteoblast and changes in body composition and fuel metabolism during ageing.

To test this hypothesis, we investigated the ageing phenotype of transgenic (tg) mice in which glucocorticoid signaling had been selectively disrupted in osteoblasts/osteocytes via targeted overexpression of the glucocorticoid-inactivating enzyme, 11βHSD2. Body weight and composition, insulin sensitivity and glucose tolerance, serum corticosteroster (CS) and osteocalcin levels as well as hepatic gene expression patterns were assessed in female 11βHSD2-tg mice and litter-matched wild-type (WT) controls at 2 and 18 months of age. From 2 to 18 months of age, female WT mice gained more in body weight (WT: +32g vs tg: +16g, p<0.01) and overall fat mass (WT: +20.7g vs tg: +6.3g, p<0.01) than their tg littermates. Eighteen-months-old WT mice exhibited reduced insulin sensitivity and hepatosteatosis, while insulin responsiveness and hepatic lipid deposition remained normal in their age-matched tg littermates. Hepatic mRNA expression of lipogenic and gluconeogenic genes was higher in aged WT compared to aged tg mice (acetyl-coA-carboxylase, WT: 12.8 vs tg: 5.6-fold increase on respective young controls, p=0.051; glucose-6-phosphatase, WT: 8.1 vs tg: 3.3-fold increase on respective young controls, p=0.09). Serum CS concentrations were similar in 18-month-old WT and tg mice and ~3-fold higher than in 2-month-old mice (p<0.05). Serum osteocalcin concentrations declined during ageing in both genotypes. Interestingly, osteocalcin remained significantly higher in tg mice at young but not at old age (p<0.05 & p=0.587).

Conclusion: In mice glucocorticoid signaling in osteoblasts is critically involved in the pathogenesis of age-related changes in glucose handling and body composition.


Hypothalamic pathways for energy intake and expenditure including recent insights into circadian cycles

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Hypothalamic circuitries are important in receiving and integrating information from other brain areas as well as the periphery to control appetite and energy homeostasis. Among the many systems involved that influence orexigenic and anorexigenic processes in the hypothalamus, the neuropeptide Y (NPY) system is unique in that its major neuronal component, NPY, stimulates appetite and reduces energy expenditure, whereas its other family members, peptide YY (PYY) and pancreatic polypeptide (PP), which are mainly produced by endocrine cells in the periphery in response to food intake, act in an opposing fashion as satiety factors. NPY peptides are able to signal energy expenditure, whereas its other family members, peptide YY (PYY) and pancreatic polypeptide (PP), which are mainly produced by endocrine cells in the periphery in response to food intake, act in an opposing fashion as satiety factors. 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Recent discoveries from our laboratory show that body weight, body composition, metabolic rate and activity of the hypothalamo-pituitary-somatotropic axis are significantly influenced by Npy6r signaling in mice, since lack of Npy6r leads to reduced lean mass and increased energy expenditure that are accompanied by significant improvements in glucose homeostasis and reduced hypothalamic Ghrh mRNA expression and circulating IGF-1 levels. Interestingly, Npy6r deficient mice develop late onset obesity, and this is further exacerbated when mice are fed a high fat diet. We have also identified PP as the endogenous high affinity ligand for Npy6r in mice. The mechanism by which Npy6r mediates its effects on the growth hormone axis and energy homeostasis is most likely through alterations in VIP signaling in the hypothalamus. This is demonstrated by the strong overlap in expression of Vip and Npy6r within the SCN, the brain region to which the Npy6r is confined to, and the significant reduction in Vip expression in this nucleus in the absence of Npy6r signaling. Moreover, the fact that i.p. PP injection increases energy expenditure and decreases food intake, hypothalamic Ghrh mRNA expression and circulating IGF-1 levels in WT but not in Npy6r-/- mice,

and that the effect on IGF-1 is blocked by prior administration of a VPAC2-specific antagonist, strongly supports this stand. Thus, PP-initiated signaling through Npy6r in VIP neurons regulates the growth hormone axis and body composition.

Circadian drivers of poor mental and physical health
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Background

Episodic bipolar and unipolar mood disorders are characterized by disruptions in sleep-wake cycle, patterns of physical activity and circadian rhythms. These phenomena are most evident in those who experience recurrent mania or ‘atypical’ depressive episodes. As 75% of major mental disorders emerge before age 25 years, the focus on recording the earliest features of these disorders in teenagers and young adults

Methods

We have investigated sleep-wake cycle, physical activity and circadian features in young persons with emerging mood disorders in two large clinical samples (n=307, 30% bipolar-type, mean age = 19 years; n=1797, 16% bipolar-type, mean age = 18 years). Additionally, we are investigating phenotypic and circadian features in a longitudinal study of adolescent twins (n=2459, mean age=16 years). Measures include objective and prolonged actigraphic-derived assessments of 24-hour sleep-wake cycles and daytime physical activity, early evening melatonin secretion patterns and relevant metabolic function parameters in selected sub-groups.

Results

In clinical samples, there is evidence of delayed onset and offset of sleep-wake cycles, reduced day-time physical activity and disrupted onset of night-time melatonin release in up to half of young persons with emerging mood disorders. These features are more pronounced in those with more severe conditions and those with a history of mania or hypomania episodes. In twins, sleep-wake cycle phenotypes are predicted by shared genetic characteristics and appear to have their own longitudinal associations with the ‘atypical’ as distinct from more classical ‘anxious depression’ illness-type. Additionally, hypomanic-type features are extremely common in young people, with about one-in-five reporting at least one episode of sleep disturbance and activitation prior to age 25 years.

Conclusion

Delayed sleep offset and disrupted circadian function are characteristics of a major subgroup of young people with emerging mood disorders. While under strong genetic control, these features are exacerbated by other environmental and illness-related factors. These studies provide unique data concerning relationships between circadian factors and the onset and course of depression, and other comorbidities, in young persons during the early phases of illness. Circadian systems may represent a key target for behavioural or pharmacological treatments of depression independent of other illness characteristics.


Creating a healthy home environment for preschool children: A qualitative study of parents’ perceptions of an intervention program

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Early childhood is an ideal time for interventions to address the development of unhealthy weight gain; understanding why interventions do/do not work is essential for developing new and effective programs. This study was a process evaluation of a parent-based preschooler obesity prevention intervention (MEND 2-4) and aimed to: (1) investigate the program-related opinions of participants; (2) understand the support and resources used, and barriers to creating a healthy home environment; and (3) explore parents’ perceptions regarding raising a preschool child within a healthy home environment. Participants were 20 randomly selected intervention group parents who took part in a randomised controlled trial evaluating the efficacy of MEND 2-4. Each parent completed one semi-structured phone interview about their thoughts and experiences related to MEND 2-4, and questions regarding the establishment or maintenance of healthy behaviours and attitudes around creating a healthy home environment for themselves and their preschool-aged child. Interviews were reviewed for thoughts and experiences related to MEND 2-4, and questions regarding the establishment or maintenance of healthy dietary and physical activity behaviours included facilities and activities, family, media, and other people, hampered by lack of time, work pressures, and insufficient knowledge. Findings suggested that similar interventions should incorporate practical strategies, provide ideas and tools that are applicable to real world situations, allow parents and children time to learn together and separately, and provide follow-up sessions. When exploring the concept of a healthy home environment parents wanted to meet the needs of their child within their stage of development in conjunction with their own needs, recognised the importance of eating well and being physically active from an early age, and identified barriers across both the macro and microsystems of
their child’s environment. Future preschooler obesity prevention interventions should consider these issues.

Challenges in weight management post renal transplant in paediatrics

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Introduction: Excessive weight gain after renal transplantation (RTx) is a known complication in paediatric patients, with the main increases occurring three to six months post transplantation. Obesity is independently associated with negative patient outcomes. Cardiovascular disease is a significant cause of death in adulthood in paediatric patients with end stage renal disease (ESRD). To address the growing problem of obesity in this cohort, a nutrition education program was developed.

Aim: To reduce BMI z-score by 0.25 in 6 months in obese paediatric patients post renal transplantation.

Methods: A nutrition education program was developed by two paediatric dietitians with expertise in weight management and renal nutrition. The program was delivered over six months between June and November 2012 at a tertiary paediatric hospital in NSW, The Children’s Hospital at Westmead (CHW). The sessions were run during existing clinic time to minimise patient burden. Twelve paediatric patients (aged 9.58±4.12 years) were included. Primary outcome was reduction in BMI z-scores. Secondary outcome included improvements in food knowledge.

Results: Mean attendance rate was 1.83±1.59 out of six sessions. Mean BMI z-scores increased from time of RTx (-0.15±1.13), to onset of the program (0.96±1.46), to completion of the program (0.99±1.29). Attendance at group sessions did not influence BMI z-scores. A positive correlation was seen between steroid dose and increase in BMI z-score (r=0.580, p <0.05). Knowledge increased after attending the sessions, as indicated by improvement in pre and post nutrition questionnaires.

Conclusion: This cohort requires a revised strategy to engage them. Improved nutrition knowledge did not translate into behavioural change measurable by BMI z-score. Future directions for successful weight management in this patient population may require utilisation of joint expertise from the obesity and renal medical teams prior to RTx.

Diet intervention in obesity and the role of the microbial landscape

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Diet is known to be capable of achieving clinically relevant weight loss and metabolic health improvements, but the effectiveness is variable and maintenance poor. Recent data indicates that gut microbes profoundly influence our metabolic health and associations between microbial changes and weight loss during dietary intervention have been reported (e.g. change in \textit{Firmicutes} to \textit{Bacteriodetes} ratio). However there is limited consistency between studies and currently the therapeutic potential of microbial signatures for obesity intervention remains unclear. An emerging paradigm is that a systems-based view encompassing the nutritional environment, microbiome and host biology is needed. Although diet can drive changes in microbial influence on host health, this is not a one-way effect. The host system also impacts microbial community structure in multiple ways, including physiological, immunological and behavioural pathways and interactions within the microbial community affect its resistance to change. We are exploring the role of such diet-host-microbiome interactions in shaping the outcomes of diet interventions in obesity and metabolic health. Through systematic exploration of the relationship between nutrient intake and microbiome structure in animal models we have defined major drivers of microbiome composition. These insights are being applied to assess the diagnostic potential of gut microbiota in diet interventions. Our evidence indicates that weight loss is contingent on the susceptibility of the patients microbiome to shift in response to a dietary intervention. Significantly baseline microbiome signatures appear to have high potential as predictive tools in personalizing diet-based obesity management.

Intuitive eating: is a shift away from dieting the answer to weight management?

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Traditional diets that restrict energy to induce weight loss typically show patterns of weight regain, and can promote increased food preoccupation, loss of control and overeating. Some studies suggest that dieting may be associated with subsequent weight gain. Eating in response to hunger and satiety signals, termed intuitive eating, has been promoted as an alternative to deliberate energy restriction. Intuitive eating is a key recommendation of the non-dieting and Health at Every Size approaches, which advocate a shift in focus away from body weight to the improvement of health behaviours and wellbeing. An overview of research in this area will be presented, including results from Caroline’s research group at the University at Otago.
CPAP use, weight change and metabolic outcomes: Data from 3 randomised controlled trials

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6. Sydney Nursing School, University of Sydney, Sydney

Background: Recent data has shown that CPAP increases weight in a dose-dependent manner compared to sham CPAP. However it not known whether this weight gain is associated with metabolic dysfunction in a dose-dependent manner.

Methods: Patient-level meta-analysis using the first arm of three randomised sham-controlled trials was performed to test whether patients gained weight in a dose-dependent manner. Metabolic markers (fasting glucose, insulin and insulin resistance [HOMA]) were also tested to indirectly determine whether weight changes might be due to increases in fat mass. Mixed model analysis of variance was used to quantify the effects of CPAP, dose (hours/night), their interaction and regression to the mean.

Results: 82 and 79 participants received CPAP and sham respectively. High use (>20 hours/week) was associated with greater weight gain across both treatments (difference 0.96 kg; 95% CI 0.0 to 1.9, p=0.04). CPAP increased weight compared to sham irrespective of dose however the difference did not reach significance (0.83 kg; -0.08 to 1.7, p=0.07). High use of CPAP increased weight more than high use sham (1.4 kg; 0.04 to 2.9, p=0.05) and more than low CPAP use (1.6 kg; 0.4 to 2.8, p=0.01). There was no difference between high and low sham users (0.36 kg; -1.0 to 1.7 NS). Neither treatment alone, CPAP dose alone nor the combined effect of both influenced glucose, insulin or insulin resistance.

Conclusion: High use CPAP increases weight compared to high use sham and low use CPAP without any subsequent changes in metabolic dysfunction. It is possible an increase in lean muscle mass rather than fat is the cause of the weight gain which may not necessarily have a detrimental effect on health.

Genome wide methylation analysis identifies differentially methylated CpG loci associated with severe obesity in childhood.

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Introduction: Childhood obesity is a major public health issue. Here we investigated whether differential methylation was associated with morbid childhood obesity.

Methods: We studied methylation profiles in whole blood from 79 morbidly obese children (mean BMI z-score 2.6) and 71 age/sex matched controls (mean BMI z-score 0.1). The morbidly obese children were derived from a tertiary clinical referral centre at Princess Margaret Hospital, Perth. Controls were recruited from schools. DNA samples from the obese subjects were pooled and DNA from the control subjects were pooled. These pooled samples were analysed using the HumanMethylation 450K BeadChip array.

Results: Comparison of the methylation profiles between obese and control subjects revealed 80 differentially methylated CpG (DMCpG) loci associated with 80 unique genes that had a greater than 10% difference in methylation and a p value <0.05. The top pathways enriched amongst the DMCpGs were cellular developmental, growth and proliferation and cell to cell signalling. To validate the associations between the methylation of selected DMCpGs with childhood obesity, pyrosequencing-based bisulfite PCR analysis was carried out across the DMCpGs within FYN, IGFBP3, PIWIL4 and TAOK3 in individual subjects.

FYN (Cg26846943) was hypermethylated in obese individuals (p=0.012), while lower methylation of IGFBP3 (Cg17209188, p=0.001), PIWIL4 (Cg16436, p=0.003) and TAOK3 (Cg17627898, p=0.001) were associated with obesity.

Conclusions: In conclusion, our genome wide analysis provides evidence that childhood obesity is associated with changes in DNA methylation in whole blood. These findings suggest that epigenetic processes and early life programming may play a role in the pathogenesis of childhood obesity. Further studies are required to determine the causal direction of this relationship.

Functional significance of rosiglitazone treatment on β-adrenoceptor function on brite adipocytes derived from inguinal white adipose tissue

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The high prevalence of obesity has provoked substantial interest in adipocyte thermogenesis. Several studies have revealed functional BAT in adult humans, and have demonstrated inducible brite (brown in white) adipocytes in animal models by multiple stimuli including the
PPARγ activator rosiglitazone. Brite adipocytes are characterised by expression of the uncoupling protein UCP1 and although derived from a white adipocyte lineage, they express the brown adipocyte transcriptional co-regulator Prdm16. We determined the effect of rosiglitazone on β-adrenoceptor function (assessed by oxygen consumption rates (Seahorse XF96), cyclic AMP assays, glucose uptake assays) in primary mouse adipocytes from interscapular BAT and inguinal WAT (iWAT). OCR, cyclic AMP and glucose uptake responses were absent-minimal from control iWAT cultures but were markedly induced in rosiglitazone-treated cells. Preliminary experiments investigating the in vivo effect of rosiglitazone on β-adrenoceptor function was assessed using whole body oxygen consumption and in vivo glucose uptake, which showed a trend for increased β-adrenoceptor function in vivo. These studies suggest that cells from iWAT undergo rosiglitazone-induced brite differentiation and have the capacity for increased thermogenesis via UCP1 activation, which may be of significance in vivo.

Effects of bariatric surgery on adipokine profile over 12 months in humans

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Background: Data examining the effect of different bariatric procedures on adipokines in humans is lacking. We examined the effect of weight loss following bariatric surgery on glycaemia, retinol-binding protein 4 (RBP4), fibroblast growth factor-21 (FGF21) and C-reactive protein (CRP).

Methods: We studied participants who underwent weight loss with diet (n=16), gastric banding (GB n=11), sleeve gastrectomy (SG n=21) and Roux-en-Y gastric bypass (RYGB n=7). Anthropometrics, HbA1c, RBP4, FGF21 and CRP were measured at baseline, 1, 3, 6 and 12 months.

Results: At baseline, mean weight was 116(±21)kg and BMI was 40(±6)kg/m², 29% had diabetes. Positive correlations were observed between CRP and baseline weight (r=0.357, p=0.007) and waist circumference (r=0.358, p=0.007) and between FGF21 and baseline waist circumference (r=0.361, p=0.007) and HbA1c (r=0.426, p=0.001), but not weight. RBP4 did not correlate with any parameter. Weight significantly decreased over 6 months after all interventions (p<0.01). Subsequent weight loss only occurred in surgical groups, with 12 month weight loss greatest in RYGB of 39.4kg (95%CI: 31.0, 47.8), followed by SG 33.1kg (28.1, 38.0) and GB 16.6 kg (9.8, 23.3). Significant changes in adipokines occurred after surgery, but not diet. CRP decreased in a similar trajectory to weight (p<0.05), with the greatest decrease in RYGB of 83% (69%, 91%). RBP4 declined by 32% (16%, 45%) in the first month following RYGB (p=0.0004), but subsequently rose and was not significantly different from baseline by 12 months. FGF21 declined 12 months post-RYGB by 55% (4%, 78%) (p=0.04). In contrast, FGF21 increased by 105% (27%, 235%) 3 months post-SG (p=0.004), but was not significantly different to baseline at 6 months.

Conclusion: Bariatric surgical procedures had differential effects on adipokines. Unlike CRP, changes in FGF21 and RBP4 did not parallel changes in weight. The role of these adipokines in mediating metabolic effects of bariatric surgery deserves further study.

‘Systems biology – the next frontier in metabolic research’

David James1

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Metabolic diseases comprise a growing list of diseases like diabetes, cardiovascular disease and cancer. These diseases are referred to as complex diseases because they are strongly heritable, yet unlike simple monogenic diseases, they are due to multiple mutations affecting many genes in the genome. GWAS has been valuable in identifying candidate loci but so far in the case of diabetes these genetic risk factors account for 2-5% of the entire risk that is attributed to family history. Another factor in the emergence of these diseases is lifestyle particularly excess calories and insufficient exercise. During my lecture I will present information that there is no one single ideal lifestyle for humans due to genetic diversity. Hence, this represents what I believe to be one of the most challenging and intriguing problems in biology – dissecting the gene x environment interaction. A case will be made that this is a classic systems biology problem requiring a combination of both large scale and focused studies in model systems as well as in humans.

HIIT and other novel exercise or nonsitting strategies: fact or fiction for the management of obesity?

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Current physical activity recommendations for obesity management emphasise high energy expenditure via frequent prolonged exercise. Although human experimental trials show that this can be effective, the majority of the population fails to meet these recommendations. Furthermore, results from clinical trials indicate that exercise interventions usually do not lead to significant or sustainable weight loss, and
there is large individual variation in response. Therefore, increasing research interest has centred on the benefits of exercise independent of weight loss, and the usefulness of physical activity at levels below current guidelines for obesity management.

High-intensity interval training (HIIT) involves repeated bursts of vigorous exercise interspersed with low intensity recovery. A benefit of HIIT on cardiorespiratory fitness, glycaemic control and fat loss has been shown in some studies, but very few have made head-to-head comparisons of HIIT versus traditional aerobic exercise on fitness and fat loss in overweight or obese humans. Our studies in previously inactive overweight/obese adults suggest that vigorous aerobic exercise training at doses below current recommendations is effective for improving fitness and reducing visceral and liver fat levels without meaningful weight loss, thereby offering a promising angle of investigation for future human obesity interventions. However, despite improving fitness, time saving HIIT interventions do not appear to benefit abdominal fat levels.

Sedentary behavior (including too much sitting) has recently emerged as a distinct health risk, which is arguably independent of physical activity and exercise levels. Cross-sectional and longitudinal research has shown a relationship between sedentary behavior and health outcomes including overweight/obesity and metabolic syndrome. However, research on the efficacy of interventions based on changing sedentary behavior is in its early phase, and there is a clear need for intervention studies with physiological outcomes.

Molecular determinants of brown/beige fat function
Shingo Kajimura
1
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Content to be provided shortly.

Engineering fat cell fate to fight obesity and metabolic diseases
Shingo Kajimura
1
1. University of California, San Francisco, CA, Australia

All mammals harbor two types of adipose tissues that serve distinct physiological functions: white adipose tissue (WAT) and brown adipose tissue (BAT). WAT functions mainly in the storage of excess energy, while BAT specializes in dissipating energy in the form of heat and functions as a defense against hypothermia. Recent studies report that adult humans also have significant amounts of active BAT and its mass inversely correlates with adiposity, indicating the potential importance of BAT in human obesity.

Our lab aims to understand the developmental and molecular circuits that regulate fate specification of brown adipocytes and to investigate their roles in energy homeostasis under pathological conditions such as obesity and diabetes. Recent studies in our lab will be reviewed and discussed in the lecture.

Socio-economic differences in the prevalence and treatment of severe obesity in Australian adults, 2012
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Background: A socioeconomic gradient in obesity (all classes), where greater prevalence of obesity is observed in more disadvantaged groups, has been reported in most developed countries. However, no previous study has explored the relative differences in the prevalence of obesity classes I, II and III, across socioeconomic strata.

Objective. To examine socio-economic differences in the prevalence and treatment of severe obesity in Australian adults during 2012.

Methods. Prevalence data were sourced from the National Health Survey 2011-12 for the Australian population aged 18+ years. Obesity classifications were based on measured height and weight (class-I BMI [kg/m²]: 30.0-34.9, class-II: 35.0-39.9 and class-III: ≥40.0). Severe obesity was defined as either class-II or III obesity. Socioeconomic position was classified according to an area-level measure; the Index of Relative Socio-economic Disadvantage (IRSD). The Australian Institute of Health and Welfare provided IRSD data for all national bariatric surgery episodes (n=14,056) undertaken in the population aged 18+ years during 2011-12.

Results. The prevalence of class-I obesity generally increased with increasing levels of disadvantage; ranging from 14.1% in quintile 5 (least disadvantaged) to 19.3% in quintile 1 (most disadvantaged). Corresponding figures for class-II obesity were 8.6 and 5.5%; and for class-III obesity 4.8 and 1.7%. The relative risks of class-I, II and III obesity in the most disadvantaged group, relative to the least disadvantaged group were 1.4, 1.9 and 2.8 (all P<0.05). Severe obesity affected 1/16 people in the least disadvantaged and 1/7 people in the most disadvantaged quintile. Bariatric surgery treatment rates decreased with increasing levels of disadvantage.

Conclusion. During 2011-12, obesity prevalence increased with increasing levels of disadvantage in Australian adults, and the gradient was most pronounced in more severely obese classes. Observed socioeconomic inequalities in the use of bariatric surgery may further increase existing inequalities in obesity and related health outcomes.
Metabolic effects of access to 10% sucrose solution in female rats and transmission of some effects to their offspring

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Background and significance
Excessive sucrose consumption can increase the risk of weight gain and metabolic disease, while maternal diet quality can alter the metabolic profile of offspring. This study examined (a) the metabolic effects of 10% sucrose solution in female rats from pre-pregnancy to offspring delivery, and (b) the effects of maternal sucrose consumption on offspring metabolic health when combined with sucrose exposure and regular exercise.

Methodology
Female adult albino Wistar (AAW) rats had unrestricted access to 10% sucrose solution, chow and water (Sucrose group) or chow and water only (Control group) for 4 weeks. This diet manipulation continued through 1 week of mating and the subsequent 3 weeks of gestation. At parturition, offspring were reduced to litters of 8 (5:3♂:♀) and were fed chow and water with no intervention for 7-wk. Physical activity and glucose tolerance were then assessed in male and female offspring from Sucrose and Control mothers (Cohort 1). A separate group (Cohort 2) of male offspring received unrestricted access to 10% sucrose solution for 7-wk, with or without moderate exercise (wheel running) for 2-h on alternate days.

Results
During the diet manipulation, sucrose-fed females gained more weight, became glucose intolerant, and showed elevated blood triglyceride levels. No effect of maternal status was observed on offspring body weight, glucose tolerance or activity levels in Cohort 1. In Cohort 2, exercise inhibited weight gain during sucrose exposure, and interacted with maternal status to reduce retroperitoneal fat, fasting insulin and glucose only in offspring of sucrose-fed mothers.

Conclusion
The sugar diet had significant effects on mothers’ health status but only limited impact on their offspring. While combined high-fat, high-sugar maternal diets often yield direct intergenerational effects, our results suggest that effects of maternal sucrose feeding on offspring may be revealed only when diet and exercise are manipulated.

Gastric vagal afferent satiety signals are modulated by endogenous and exogenous oestradiol

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Food intake is reduced during oestrus in rodents through a reduction in meal size. This is just after the peak in plasma oestradiol (E2) levels. Exogenous E2 reduces meal size and overall food intake in ovariectomized rats 1 . Whilst E2 can act on the arcuate nucleus to reduce food intake, the E2 receptors, ERα, ERβ and GPR30 are also expressed in the cell bodies of vagal afferents located in the nodose ganglia 2 . Furthermore, E2 can sensitize cultured vagal neurons 3 . This suggests there may also be a peripheral site of action on food intake because activation of mechanosensitive gastric vagal afferents (GVAs) induces satiety. However, whether E2 can act on GVAs to modulate satiety signals and whether the reduction in food intake during oestrus has a vagal origin is unknown.

The oestrous cycle stage of 8wk old female C57BL/6 mice was determined using vaginal cell cytometry (N=3/cycle stage) 4 . Single fibre recordings of GVA mechanoreceptors were made 5 in the absence and presence of E2 (10-1000pM). Recordings were also taken after pre-incubation with the ERα selective antagonist, fulvestrant. Nodose ganglia ERα, ERβ and GPR30 mRNA levels were quantified by quantitative RT-PCR.

Tension receptor response to stretch (3g) was increased in mice currently in oestrus (p<0.05 vs. dioestrus). There was no difference in the response of mucosal receptors to mucosal stroking (50mg) at any oestrous cycle stage. E2 dose dependently potentiated mucosal and tension receptor responses to mucosal stroking (10-1000mg, p<0.001) and stretch (1–5g, p<0.05) respectively. The potentiation caused by E2 on tension and mucosal receptors was blocked by pre-incubation with fulvestrant. All three E2 receptors were present in the nodose ganglia, but there was 60 and 25 times more ERα mRNA present than ERβ or GPR30 respectively (p<0.001).

Together this data suggests that the reduction in food intake observed during the oestrous stage may be due to an ERα mediated E2 induced potentiation of tension receptor mechanosensitivity.

High dietary fat intake negatively affects bone mass in mice via osteoblastic glucocorticoid signalling

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High-fat diets adversely affect bone strength in mice while simultaneously increasing systemic glucocorticoid levels. We hypothesise that a mechanistic link exists between high-fat intake, increased glucocorticoid signalling in osteoblasts and poor bone health. We tested this hypothesis in a transgenic (tg) mouse model in which glucocorticoid signalling has been selectively disrupted in osteoblasts/osteocytes via targeted overexpression of the glucocorticoid-inactivating enzyme, 11β-hydroxysteroid dehydrogenase type 2. Seven-week-old male tg mice and their wild type (WT) littermates (n=6-9/group) were fed ad libitum a control diet (14.3% energy from fat, 25.5% from protein) or an isoenergetic high-fat diet (HFD; 43.0% energy from fat, 25.5% from protein) for 18 weeks. Body weight and food intake were measured weekly. Serum corticosterone levels were quantified after 10 weeks of feeding, and body composition and bone parameters were assessed at endpoint. As animals were fed an isoenergetic diet, changes in body weight and body composition did not differ between the four groups. Both WT and tg mice fed the HFD had higher serum corticosterone levels than WT or tg control mice (pooled measures: 386±35μg/mL for HFD vs. 285±36μg/mL for control diet; p=0.054). Corticosterone levels in WT and tg mice fed the same diets (either HFD or control) were similar. At endpoint, WT mice fed a HFD had significantly lower BMD than both WT mice receiving the control diet (0.058±0.001g/cm2 vs. 0.064±0.0007g/cm2; p<0.005) and tg animals fed the HFD (0.058±0.001g/cm2 vs. 0.063±0.001g/cm2; p<0.005). Similarly, WT mice on HFD exhibited lower BMC than WT control mice (0.64±0.02g vs. 0.74±0.02g; p<0.005) and tg mice receiving the HFD (0.64±0.02g vs. 0.72±0.02g; p<0.005). Neither BMD nor BMC differed significantly between tg control and tg HFD mice.

We conclude that high dietary fat intake negatively affects bone mass via glucocorticoid signalling in osteoblasts and osteocytes.

The differential effect of socio-economic status on body mass index among Aboriginal children & adolescents

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Background: Aboriginal children have a higher prevalence of overweight and obesity, with the influence of socioeconomic status being unclear. Our aim was to determine the changes in BMI between Australian Aboriginal and non-Aboriginal children as they move through adolescence into young adulthood.

Methods: A prospective cohort study of Aboriginal and non-Aboriginal children commenced in 2002 across 15 different screening centres involving 38 primary schools and 213 high schools across urban, regional and remote NSW. Based on postcode, socio-economic status was measured using the index of relative social advantage and disadvantage, and recorded at study enrolment. Participants’ BMI was measured every 2 years. We fitted a series of mixed linear regression models adjusting for age, Aboriginality, birth weight and socioeconomic status for boys and girls.

Results: 3418 (1949 Aboriginal) participants were screened over a total of 11, 387 participant years follow up. The prevalence of obesity was 14.2% (mean age 11 years) at baseline, and increased to 17.2% at eight years follow up (mean age 16 years). The mean BMI of Aboriginal girls was significantly higher than non-Aboriginal girls with increasing age (P<0.01). Girls born at low birth weight were of lower BMI than girls with a normal birth weight (P<0.001). Socioeconomic status and birth weight had a differential effect on mean BMI for Aboriginal children compared to non-Aboriginal children (P for interaction = 0.01). Aboriginal boys of highest socioeconomic status had a higher BMI compared to non-Aboriginal boys, but not those of lower socioeconomic status. Non-Aboriginal boys of low birth weight were heavier than Aboriginal boys of low birth weight. Comment on Aboriginal and non-Aboriginal girls?

Conclusions: Socioeconomic status and birth weight has a differential effect on adiposity for Aboriginal boys, similar to that seen in low and middle income countries. Intervention programs need to recognise the differential risk for obesity for Aboriginal and non-Aboriginal boys and girls to maximise their impact.

Maternal diet and infant body composition in women at risk of gestational diabetes mellitus

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Introduction
Prenatal and early postnatal nutritional environments are critical windows for disease development in later life. The aim of this study was to explore the association between maternal dietary intake and neonatal body composition.

Methods
Secondary analysis of women enrolled in a randomized controlled trial comparing the effect of a low glycaemic index diet vs a healthy diet in pregnancy at risk of gestational diabetes (n=139). Maternal dietary data was collected using 3-day food records in the second and third trimesters. Neonatal body composition was assessed by air-displacement plethysmography. Infant body composition was expressed as fat mass index [FM (kg)/length (m)^2] and fat-free mass index [FFM (kg)/length (m)^2].

Results
Using linear regression, adjusted for confounders, second trimester maternal dietary carbohydrate (%E) was inversely related to offspring FFM index (β = -0.196, P = 0.050, n=96), while total fat and saturated fat were positively associated (%total fat, β = 0.241, P = 0.016; %saturated fat, β = 0.250, P = 0.012, n=96). In the third trimester, intake of total fat and saturated fat was positively associated with FM index (%total fat, β = 0.224, P = 0.037; %saturated fat, β = 0.216, P = 0.036, n=88), while the quantity and quality of carbohydrate was inversely associated with both FM index (%carbohydrate, β = 0.243, P = 0.037) and FFM index (GI, β = -0.267, P = 0.013).

Conclusion
Fetal body composition may be influenced by maternal diet, particularly the quantity and quality of fat and carbohydrate. Both FFM and FM index appear to be increased by higher fat intake (including saturated fat), but reduced by higher intakes of carbohydrate, particularly from high GI sources. Whether these associations are causal requires further study.

Comparison of body mass index (BMI), body adiposity index (BAI), waist-to-hip ratio (WHR) and waist-to-height ratio (WHtR) as predictors of cardiovascular disease in an adult population in Singapore

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The purpose of this study is to investigate and compare the relationship between the various adiposity measures, namely Body Mass Index (BMI), Waist Circumference (WC), Waist-to-Hip Ratio (WHR), Waist-to-Height Ratio (WHtR) and the recently proposed Body Adiposity Index (BAI) and cardiovascular disease (CVD) risk factors such as hypertension, diabetes mellitus and dyslipidemia in an adult population in Singapore, a South-East Asian country.

This is a cross sectional study involving 1,891 subjects (Chinese 59.1% Malay 22.2%, Indian 18.7%), aged 21-74 years, based on an employee health screening (2012) undertaken at a regional hospital in Singapore. Anthropometric indices and CVD risk factor variables were measured, and Spearman correlation, Receiver Operating Characteristic (ROC) curves and multiple logistic regressions were used in the analysis.

After adjusting for BMI, BAI did not further increase the odds of CVD risk factors unlike WC and WHR. WC and WHR consistently had the highest estimated areas under ROC curve and odd ratios, although the differences were often small with overlapping 95% confidence intervals. Comparing between WC and WHR, WHIR ≥ 0.501 was found to be generally more sensitive than WC ≥ 80 cm for females, and ≥ 90 cm in males. When a combination of measures were included in the evaluation, a BMI of ≥ 23.5kg/m^2 and/orWHIR ≥ 0.5 yielded the highest proportion who would have been identified amongst those with the various CVD risk factors for all the CVD risk factors in both gender.

BAI may function as a measure of overall adiposity but it is unlikely to be better than BMI. While BMI, WC and WHIR seem comparable in their association with CVD risk factors, a combination of BMI and WHIR would have the best clinical utility in identifying patients with CVD risk factors in an adult population in Singapore.


Sympathetic overactivity and endothelial dysfunction in polycystic ovary syndrome is independent of obesity and metabolic profile

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Polycystic ovary syndrome (PCOS) is a common endocrine condition associated with long-term cardiovascular risk factors. PCOS women often present with obesity, metabolic abnormalities (insulin resistance and dyslipidemia) and preliminary data has suggested autonomic imbalance [elevated sympathetic nervous system (SNS) activity and decreased heart rate variability (HRV)] as well as endothelial
dysfunction. However it is not clear whether these abnormalities are driven by the underlying level of obesity and metabolic disturbance or whether they are independently related to PCOS. We therefore examined multi unit and single unit muscle SNS activity (by microneurography), HRV (time and frequency domain analysis or short term R-R intervals) and endothelial function [ischemic reactive hyperaemia index (RHI) using the EndoPat device] in 20 overweight women with PCOS (BMI: 31±1 kg/m2, age: 32±2 years) and compared them to 23 control overweight women (BMI: 33±1 kg/m2, age: 29±2 years) presenting the same metabolic profile (total, HDL and LDL cholesterol, fasting glucose, triglycerides and blood pressure). PCOS women had elevated multiunit muscle SNS activity (40±2 vs 33±3 bursts per 100 heartbeats, P<0.05). Single unit analysis showed that vasoconstrictor neurons were characterized by elevated firing rate and probability and incidence of multiple spikes in PCOS compared with control women (P<0.01 for all parameters). PCOS women also had impaired endothelial function (RHI: 1.77±0.03 vs 2.16±0.14, P<0.05). HRV did not differ between the 2 groups. PCOS women have increased sympathetic drive and impaired endothelial function greater than that expected from obesity and metabolic disturbances alone. Sympathetic activation and endothelial dysfunction may confer greater cardiovascular risk in women with PCOS.

Male offspring from obese fathers develop growth defects associated with perturbation of the lipid metabolism.

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Transgenerational inheritance of metabolic disease may be a strong contributor to the global obesity epidemic. While the impact of maternal obesity on offspring metabolism is well documented, strong evidence for an influence of paternal obesity is just emerging. Our group was one of the first to demonstrate that paternal obesity confers metabolic changes to the female offspring (Ng et al, 2010). Here we show that the male offspring are also impacted by their father’s metabolic status.

Sprague-Dawley rat fathers were fed either a control diet (CD-F0) or a high fat diet (HFD-F0) for 14 weeks before being mated with control females. The male offspring were weaned onto a control diet and killed either at 8 weeks or 6 months of age. Five weeks after weaning, the males from HFD-F0 showed a slow down in growth resulting in a significantly lower body weight from 9 weeks to 6 months of age. A decrease in plasma level of growth hormone and IGF1 was detected in 8 week old rats from HFD-F0. These rats presented smaller fat pads with a decrease in expression of Pparγ and IGF1r in retro-peritoneal fat. In parallel, a decrease in expression of genes involved in muscle growth (Ghr, Igf1, mTOR and MyoD) was observed in tibialis anterioris muscle of males from HFD-F0. The changes in growth and metabolism appeared to have no impact on glucose tolerance of 6 months old offspring. As observed in other models of programming (e.g. maternal low protein diet), investigating later stages of adulthood may uncover more direct metabolic consequences indicative of disease.

Fatty shades of brown colour metabolism in humans

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White fat was once believed to be the only significant adipose depot in adult humans. Advances in positron emission tomography (PET)/CT imaging have led to the rediscovery of brown fat in adults. Brown fat is metabolically active, and greater abundance is associated with lower adiposity, glycaemia and enhanced adaptive thermogenesis. Recent experiments in animals have identified a third kind of adipose, consisting of brown fat-like cells (known as ‘beige’ or “brite” adipocytes), which can be induced within white fat by cold stimulation. High brown/beige fat states reverse diabetes, obesity and hepatic steatosis in animals. The appreciation of the white-beige-brown fat spectrum has brought new hues to our understanding and interpretation of metabolism in humans. White fat browning and brown fat whitening may underlie metabolic adaptation and pathologic transformation in physiologic and disease states. Knowledge on how fat changes colours and how such changes impact health and disease may illuminate novel therapeutic strategies in the combat against diabetes, obesity and related metabolic disorders.

Text message to promote breastfeeding and obesity-protective eating behaviours in young children: 12 and 24 months BMI results

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**Background & Aim:** Short message services (SMS) via mobile phone is the most widely adopted and inexpensive way for modern communication. It has been used in health promotion and disease prevention. Appropriate infant feeding practices have long-term health effects, including obesity prevention. However, published findings on improving early infant feeding to prevent childhood obesity are limited. The aim of this study was to assess the effect of an SMS intervention on child BMI at 12 and 24 months.

**Method:** A quasi-randomized experimental design was used. 582 expectant mothers (281 intervention; 301 control) were recruited in the
Overweight and Obesity Status Among Children and Adolescents in South China and Its Characteristics

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Introduction: Childhood obesity is a global health problem. Yet, there is limited information on Chinese children. Our aim was to examine the prevalence of overweight/obesity in children of South China, and to describe its characteristics.

Results: The intervention group had a significantly higher median duration of exclusively breastfeeding (EBF) at 30 weeks than the control group (11.4 weeks [95% CI, 10.3-12.6] vs 8.9 weeks [95% CI, 7.8-9.9]; P<0.001). The average BMI at 12 months was 17.08 and 17.16 kg/m\(^2\) for the intervention and control groups, respectively, and 15.94 and 15.88 kg/m\(^2\) at 24 months, respectively. There was no statistically significant difference in BMI after controlling for maternal age, maternal education, household registration, housing arrangement, family income, baby's gender, pre-pregnancy maternal BMI, father's BMI, baseline awareness of WHO breastfeeding guidelines and childhood obesity.

Conclusion: A mobile phone SMS intervention could be effective in promoting EBF, but may not influence BMI at 12 and 24 months.
Cross-sectional Association of Grain and Tubers with Body Composition among Children and Adolescents in South China

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Introduction: Studies of Western countries revealed that dietary carbohydrate seemed to be relevant to obesity. However, studies about the relevance of foods rich in carbohydrate among Chinese children on their body composition are lacking. Our aim was to investigate whether the consumption of grain and tubers is associated with body composition in Chinese children.

Materials & Methods: Cross-sectional valid data from 2006 children (52.3% boys) aged 7-18 years in South China were analyzed. Weight, height and skinfold thickness were measured. Body mass index, body fat percentage (%BF), fat mass index (FMI) and fat free mass index (FFMI) were calculated. International Obesity Task Force (IOTF) criteria was used to define overweight and obesity. Based on food frequency questionnaire, the daily consumption of grain and tubers was calculated. Prevalence of overweight and obesity, %BF, FMI and FFMI were compared between low/median/high food consumption groups using chi-square tests or Wilcoxon signed rank tests for each age group, respectively.

Results: %BF and FMI were higher in girls than those in boys. Boys (402.4g/d) consumed more grain than girls (344.8g/d) (p<0.0001), and children aged 13-15 years consumed more grain than the other age groups. Similar associations were not observed for tubers. There was no significant difference of overweight/obesity prevalence between low/median/high food consumption groups. Among children aged 13-15 years, %BF, FMI and FFMI were significantly different between grain consumption groups (p<0.0001), and children consumed the least servings of grain had highest %BF and FMI. Moreover, FMI and FFMI were significantly different between tubers consumption groups among 10-12 years group (p<0.05).

Conclusions: Among Chinese children, consumption of grain and tubers seems to be correlated with obesity, and this relevance is primarily for body composition among older children.

Co-creating evidence on obesity prevention implementation through case studies

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As obesity prevention practitioners increasingly recognise the need to up-scale initiatives and embed changes into environments and systems, sharing of information on how to do this is crucial. Evidence-informed practice acknowledges the use of various types of knowledge and evidence to guide decision-making, most often through peer-reviewed publications, guidelines and syntheses. Knowledge acquired through professional experience is an equally important evidence source. Narrative approaches, such as case studies, can capture this tacit knowledge or evidence from practice, however, methods and tools for their systematic collection, appraisal and reporting are limited.

The Australian Collaboration of Obesity Prevention Sites (CO-Ops) links practitioners with research and policy to encourage best practice. To facilitate the systematic capture of case study information, CO-Ops developed and piloted an appraisal tool (informed by tools from the WHO and CDC). This tool assesses the alignment between reported practices and five pre-determined best practice principles (BPPs), featuring 24 components, relating to consultation, planning, implementation, sustainability and evaluation of community-based initiatives (CBI).

The appraisal tool was piloted on 14 CBI around Australian in 2013/4. Case studies were found to have applied a range of components across the five pre-determined BPPs. The most commonly applied BPP was program design and planning specifically components of problem analysis; target groups and equity; and program positioning and framing. Components least applied were funding; adaptation and responsiveness; and use of theory/levers for change. Feedback and support on identified BPP gaps was provided by CO-Ops to the practitioner to enhance reporting and dissemination, and strengthen future CBI.

The CO-Ops case study approach has the potential to enhance awareness and adoption of best practice principles by practitioners and to produce a co-created narrative that can contribute tacit knowledge to the evidence base for population level obesity prevention responses.
Does bariatric surgery work in public hospitals?

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The aim of this study was to determine the efficacy of bariatric surgery in the public sector for the treatment of complicated obesity.

Methods: A longitudinal observational study of obese participants with co-morbidities, aged 21-73 years, who underwent publicly-funded bariatric surgery was performed. Data was extracted from clinical databases (from October 2009 through September 2013) and recorded at seven time points. Participants are from an ongoing public obesity management programme.

Results: The mean weight loss of 65 participants in the cohort was 22.6 kg (SD, 9.5 kg) by 3 months, 35.4 kg (SD, 20.1 kg) by 12 months and 38.9 kg (SD, 21.9 kg) by 24 months (P < 0.001). Body mass index (BMI) decreased from a preoperative mean of 48.2 kg/m² (SD, 9.5 kg/m²) to 35.7 kg/m² (SD, 7.7 kg/m²) by 24 months (P < 0.001). Full resolution of comorbid conditions by 18 months (P < 0.001) was achieved by almost half of those who had T2DM at baseline (11/23), nearly two thirds of those with HTN (17/27) and three quarters of those with OSA (18/24), with continued improvements observed beyond 24 months. Two of the 65 laparoscopic procedures performed required revision after 18 months and six other subjects experienced mild complications, all of which had resolved by 12 months.

Conclusions: Bariatric surgery performed publicly is efficacious in the treatment of obese subjects with co-morbidities. Our findings parallel similar studies, suggesting that there is equal benefit in publicly-funded and privately-performed procedures. This study highlights that obese patients reliant on public healthcare maintain sufficient intrinsic motivation in the absence of payment and supposed value-driven incentive. Improved access to bariatric surgery publicly can justifiably reduce the health inequities for those most in need.

Do people with morbid obesity have deep psychological problems? Apparently not.

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Background: Morbid obesity is the most severe condition among individuals with obesity and is associated with debilitating clinical complications and behavioral issues. However, the psychological processes underlying unhealthy behaviors in individuals with morbid obesity remains unexplored. There are few studies on the occurrence of distorted or dysfunctional cognitions amongst morbidly obese individuals, and even fewer studies comparing this with the occurrence of dysfunctional cognitions in lean individuals. Greater understanding of the psychological issues associated with morbid obesity could provide insights to help prevent and treat this complex and harmful condition.

Objective: The aim of this study was to compare the occurrence of dysfunctional thinking processes, namely cognitive distortions and early maladaptive schemas, in people with morbid obesity versus people of normal weight.

Methods: 111 participants – 53 morbidly obese and 58 of normal weight – were assessed with the Mini-Mental State Examination (MMSE), the Cognitive Distortions Questionnaire (CD-Quest), the Young Schema Questionnaire (YSQ-S2), and the Depression, Anxiety and Stress Scale (DASS-21).

Results: No significant differences were found between groups on cognitive distortions and early maladaptive schemas, except for the maladaptive schema of “insufficient self-control / self-discipline” which was more prevalent in the morbidly obese group compared to the group of normal weight. This failed to reach statistical significance when adjusted for levels of depression, anxiety and stress symptoms.

Conclusion: There were no broad differences in regards to the levels of distorted or dysfunctional cognitions amongst morbidly obese versus lean individuals. Whilst “insufficient self-control / self-discipline” early maladaptive schemas may be more common amongst individuals with morbid obesity, this was confounded by symptoms of depression, anxiety and stress. These findings have potentially important implications for the treatment of morbidly obese individuals, disproving hypotheses that people with morbid obesity might have deep psychological problems associated with their excessive weight.

Excess gestational weight gain and its long term health impact- public health burden and policy

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Background

Gestational weight gain (GWG) is associated with postpartum weight retention (PPWR) in women. However, the strength of the association between GWG and long-term PPWR and obesity and its public health burden and health policies are still unclear.

Methods

We have conducted three sets of analyses. Firstly, publications from different databases were systematically extracted and the articles relevant to this study were reviewed to quantify the effect estimate of GWG on PPWR and BMI using a bias-adjusted method. The Institute of Medicine categories of “inadequate,” “adequate,” and “excess” were used to define GWG. The time span for PPWR was divided into...
three periods (<1 year, 1 year to 9 years, and ≥15 years) to determine outcome at different times postpartum. Secondly, we have analyzed 27y PPWR data of the Mater-University of Queensland Study of Pregnancy (MUSP) cohort (N=2000) considering potential confounders and mediators. Finally, implications of the findings in recent health policy are critically examined.

**Results**

Meta analyses of 12 studies showed that women with an inadequate GWG had a significantly lower mean PPWR of -2.14 kg (95%CI, -2.61 to -1.66) than women with an adequate GWG, who had a mean PPWR of 3.15 kg (95%CI, 2.47 to 3.82) up to 21 years postpartum. Over the postpartum time span, a U-shaped relationship was observed between the weighted mean difference calculated for women with excess GWG and the weighted mean difference calculated for women with adequate GWG, and this relationship was time independent between these two groups. MUSP 27y post-partum data showed that women who gained excess GWG they were at 4.5 times higher risk to become obese after 27 year post-partum compared to the women who gained adequate GWG. Implications of these findings in recent health policy changes will be discussed.

**Conclusion**

The findings of this study suggest that GWG outside of the Institute of Medicine recommendations can lead to both short-term and long-term postpartum weight imbalance.

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**O-1602 reduces plasma concentrations of leptin and ghrelin but increases AST, in diet-induced obese rats**

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**Introduction:**

GPR55 is a putative endocannabinoid receptor, which has an affinity for the endogenous cannabinoid ligands anandamide and 2-arachidonoyl glycerol, which increases appetite and reduce energy expenditure. O-1602 is an agonist for GPR55/GPR18. There is limited research looking at chronic administration of O-1602 in vivo.

**Aim:**

To determine the effect of O-1602 on plasma concentration of hormones involved in appetite and glucose regulation, as well as liver function.

**Method:**

Male Sprague Dawley rats were fed a high fat diet (21% fat) for 9 weeks to induce an obese state, and then administered daily via intraperitoneal (ip) injection for 6 weeks with either 5mg/kg of O-1602 or vehicle, following which rats were anaesthetised and blood was collected via cardiac puncture, into EDTA sample tubes and plasma was stored at -80°C until analysis.

Plasma levels of leptin, ghrelin, GLP-1 and glucagon were analysed using a Bioplex multi-analyte Diabetes Kit. Plasma AST, ALT, GGT and albumin were analysed using a commercially available kit.

**Results/Conclusion:**

Treatment of obese rats for 6 weeks with O-1602, decreased body fat and increased lean tissue mass (%). Food consumption decreased in the first week of the treatment period. There was no difference in body weight, glucose tolerance or the fibrotic marker, collagen, in the liver and heart of O-1602 treated rats compared to obese control.

In addition to a reduction in body fat and food consumption, O-1602 decreased plasma leptin and ghrelin but did not alter GLP-1 or glucagon. This data suggests that O-1602 has a role in regulating adipose storage and appetite. For liver function, AST concentrations were significantly increased in O-1602 treated rats, whereas ALT, GGT and albumin were not altered. Thus this data suggests that despite the weight loss associated with O-1602, further investigation is warranted to determine the whole body effect of treatment with this drug.

**Acknowledgements:**
Translation of Basic Science Research into Brief Opportunistic Intervention and Follow-up for Pragmatic Primary Care Weight Management

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Background: Obesity related disease is epidemic and management is failing. A Request for Proposal (RFP) to develop a pragmatic ‘tool’ for Supporting Weight Management in Primary Care was announced by the Ministry of Health (MoH). Health provider institutions were asked for responses. The basis of the brief was:

Aims: “An evidence-based brief opportunistic intervention (BOI) tool for general practice to support weight management. Phase 1 develop advice and resources (a tool) for primary care practitioners (PCP) on how to raise the issue of weight management and communicate effectively with patients Phase 2 trial the tool in 10-15 practices including subsidising those with high Maori, Pacific and low income enrolled populations, evaluate and modify the tool. Phase 3 make tool available nationally.”

Methods: We educated PCP’s on 1) human specific evolution that endowed humans with large brains, strong appetite pathways leading to loss of control (addiction) to high energy processed food1, and obesity 2) thousands of plant food nutrients augment basic energy and toxin management biochemistry for health2, without which degenerative disease results.

The ABC framework3 was adapted to ABO - Ask, (without judgement) with an awareness of ‘junk food addiction’ about concerns around weight/shape or eating control, BOI (eat more vegetables/fruit, be more active), Offer Ongoing Overweight care (comprehensive follow-up, and referral, packages) to interested patients. We adapted a ‘readiness to change’ screening questionnaire and inserted the programme into locally used electronic practice management systems (PMS) with drop down prompts and data recording fields.

Results: We won the RFP and will present the development of the programme and the beginning of the pilot in the general practices.

Discussion: It is vital to critique preventative and therapeutic obesity programmes in primary care. New evidenced-based hypotheses may be required. Much basic nutrition and metabolic science can be translated into innovative but pragmatic programmes.


Apolipoporotein A-I mimetic peptides improved insulin sensitivity in high fat diet fed mice.

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Background and Aim: Apolipoprotein-AI (apoAI) is the major apolipoprotein found in high density lipoprotein particles (HDLs). Recently, we have shown that full-length apoAI injected into a mouse model of insulin resistance, the high fat diet (HFD)-fed C57BL/6 mouse, improved insulin sensitivity. While our recent data provides compelling proof of concept data, intact apoA-I is not suitable as a therapy option due to the time and cost associated with its production and administration. The aim of the present study was to test whether apoA-I mimetic peptide treatment will emulate the effects of full-length apoAI to improve insulin resistance.

Method and Results: Insulin resistant C57BL/6 mice were generated by 16-weeks of HFD. Mice treated with apo A-I mimetic 5F peptide synthesized from L-amino acids (L-5F; administered by twice weekly intraperitoneal injections) or treated with apoA-I mimetic peptide 4-F synthesized from D-amino acids (D-4F; administered via drinking water) showed: (i) improved glucose tolerance and insulin sensitivity that was associated with decreased hepatic inflammation (TNFalpha, IL6, IL-1beta and IFN-gamma); (ii) suppression of hepatic mRNA expression of gluconeogenesis-associated genes (PEPCK and G6Pase) and lipogenic-associated genes (SREBP1c and ChREBP) and; (iii) reduced hepatic macrophage infiltration.

Conclusions: We conclude that both the apoA-I mimetic peptides, L5-F and D4-F, improve insulin sensitivity in HFD-fed C57BL/6 mice. This effect is associated with reduced expression of inflammatory markers in the liver, reduced infiltration of macrophages and altered gene expression of genes associated with gluconeogenesis and lipid synthesis suggesting that glucose and lipid synthesis is suppressed. Together, these findings suggest that apoA-I mimetic peptides could be considered as a new therapeutic option to reduce hepatic inflammation that contributes to the development of overnutrition-induced insulin resistance.

Modulation of Pancreatic Islet Oxidative and ER stress with IL-22 to Ameliorate Metabolic Syndrome in
Obesity

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Type 2 diabetes is characterized by the inability of pancreatic β-cells to secrete sufficient functional insulin to control blood glucose in the face of the increased insulin resistance associated with obesity. β-cell dysfunction is accompanied by adverse cellular responses to high concentrations of lipids and glucose, oxidative stress, endoplasmic reticulum (ER) stress and local inflammation, although the relative contribution of these inter-related factors to diabetes pathology has remained unclear. The IL-22 cytokine boosts barrier function and wound repair in the skin and mucosa, however its receptor (IL-22R1) is most highly expressed by islet secretory cells. In murine β-cells and islets, and human islets, IL-22 down-regulates pro-oxidant genes and up-regulates anti-oxidant genes, providing protection from oxidative stress and ER stress induced by high glucose, free fatty acids and inflammatory cytokines. IL-22R1 neutralising antibodies induce oxidative and ER stress in healthy islets, demonstrating that IL-22-IL-22R1 signalling maintains islet homeostasis. Islets from mice with high fat diet-induced obesity show immune activation, chronic ER stress and hypersecretion of insulin. Ex vivo exposure to IL-22 suppresses ER stress and chemokine production, and reduces glucose-stimulated insulin secretion. Obese mice treated with IL-22 showed normalised random fed blood glucose within 7 days and normal glucose tolerance and fasting insulin by 2 weeks, at which time insulin resistance was unchanged. However, after 4 weeks treatment serum proinsulin returned to normal levels and insulin sensitivity was restored. IL-22-treated mice also lost weight and showed redistribution of adipose tissue, with increased epididymal and brown fat. Islets from IL-22-treated obese mice showed greatly reduced proinsulin secretion and near complete suppression of ER stress and inflammation. Taken together these data suggest that IL-22 is a natural regulator of β-cell insulin biosynthesis and secretion, protecting the β-cell from stress, preventing hypersecretion of poor quality insulin, and suppressing innate islet inflammation.

Examining the meal patterns of Australian adults between 1995 and 2011

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Background: International research suggests that meal patterns may be changing, possibly with adverse consequences for obesity and chronic disease. However little is known about the meal patterns of Australians. The aim of this study was to examine the changes in meal patterns of the Australian adult population between 1995 and 2011.

Methods: Data from two nationally representative Australian surveys were used (1995 National Nutrition Survey, n=10,851; 2011-2013 National Nutrition and Physical Activity Survey, n=8964). Dietary intake among adults (≥19 years) was measured via 24-hour recall and respondents in each survey reported their eating occasions (EOs) including meals and snacks. Frequency of meals, snacks and all EOs, time between EOs and energy intake (EI) from meals, snacks and all EOs were compared between the two surveys using an F-test. All results were weighted, adjusted for sample design effects and presented as means and Taylor linearized standard errors.

Results: Overall, there was little change in frequency of total EOs over time; only a small but significant increase was observed for women aged ≥65 years (5.5 [0.05] vs 5.8 [0.07], P<0.001). Time between EOs decreased among women but not men between 1995 and 2011-12 (181 [1.15] vs 171 [1.29], P<0.001). The proportion of total EI from meals decreased between 3-6% (P<0.001) whereas the proportion of total EI from snacks increased between 3-6% (P<0.001), except among men and women aged 19-24 years.

Conclusions: Small changes in meal patterns have occurred between 1995 and 2011. Changes in the amount of time between EOs and proportion of energy from snacks demonstrate a similar pattern to changes internationally. However they are smaller in magnitude which may reflect the different timescales over which meal patterns have been assessed. However, increases in the proportion of energy from snacks and the impact on nutrient profiles and health warrants further investigation.

Motherhood and obesity: 8 years of weight gain

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Background and aim: Motherhood is a predictor of obesity, however little is understood about how dietary and psychological factors might contribute to long-term weight gain amongst mothers. The aim of the current study was to track the weight of Australian mothers over an 8-year period. In addition, daily fruit and vegetable intake, frequency of alcohol consumption per day, and depressive symptoms were examined as predictors of maternal weight gain. Method: The Body Mass Index (BMI; kg/m²) of 1,470 first-time Australian mothers from the baby-cohort from the Longitudinal Study of Australian Children (LSAC) database were analysed across 5 waves of data, each two years apart. A multi-level mixed model regression was used to examine whether fruit and vegetable intake, alcohol consumption, and depressive symptoms were predictors of changes in maternal BMI while also controlling for maternal age, and socio-economic position (SEP) at Wave 1, and parity at each time-point. Findings: At Wave 1, mothers were on average 31-years-old. Over the 8-year period, maternal BMI showed an initial decrease (between Wave 1 and 2), and then significantly increased over time (from Waves 3, 4 and 5). Maternal weight gain was inversely predicted by both daily fruit consumption and SEP. Conclusion: Maternal weight tracks upwardly overtime. Higher fruit intake (which may be a proxy indicator of overall diet quality), appears to be protective factor against maternal weight gain. In contrast, women from a lower socioeconomic background are more at risk of weight gain, suggesting that resources, supports and
A Qualitative investigation of knowledge, beliefs and attitudes regarding sugar-sweetened beverages, including responses to potential regulatory measures aimed at curbing obesity

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Background and significance
Given that sugar-sweetened beverage (SSB) consumption increases the risk of overweight and obesity in adults and children, establishing public understanding of this relationship and assessing attitudes towards measures to reduce SSB consumption are health priorities.

Method
Utilising a qualitative methodology, this research explored behaviours, attitudes and beliefs regarding the consumption of SSBs, including perceptions of potential regulatory measures (e.g., taxation and restrictions on marketing/sales to children). Eight focus groups were conducted (n=57) in 2014 with regular (at least weekly) consumers of SSBs. The groups were segmented by life cycle stage (young adults and parents of primary school-aged children), SES (low and mid), and gender.

Major findings
The findings indicate that consumption of SSBs for most participants and their children was normalised, approaching multiple times per week, and considered a necessary accompaniment to physical activity. They had limited understanding of the sugar content of sports drinks, juices and flavoured waters and milks, and of the link between consumption and excess weight and did not perceive themselves to be at risk of weight gain or other associated health problems due to their SSB consumption. Participants acknowledged the need not to drink SSBs to excess; however, they had no conception of what “excess” was. There was little awareness or understanding of health agency recommendations regarding sugar consumption and SSBs. There was support for regulations to reduce consumption of SSBs amongst children, but less support and some strong disagreement with regulations that affected participants’ own consumption.

Conclusions
The findings indicate limited awareness and understanding of the link between SSB consumption and health problems, the sugar content of different drinks, and the health consequences of consuming sugar in this form, with implications for future research to progress policy.

Changes to industry self-regulation of unhealthy food advertising to children in Australia: what the processed food and beverage industries hoped you wouldn’t notice in 2014.

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2014 has seen a series of subtle but significant changes to the voluntary codes governing the advertising of food and beverage products to children in Australia. Developments included the introduction of a Practice Note to inform the application of the Australian Association of National Advertisers (AANA) Code of Advertising and Marketing Communications to Children in April 2014, and changes to elements of the packaged and fast food industries’ voluntary codes in January 2014. These changes may purport to reflect industry efforts to keep pace with emerging issues (such as new online and device-based advertising technologies). Public health advocates remain critical of the self-regulatory codes as a means of protecting children from harmful advertising of unhealthy foods and beverages.

Methodology
More than 25 complaints were submitted to the Advertising Standards Board regarding advertisements for foods and beverages alleged to target children in 2013 and 2014. Case studies from the resulting decisions were analysed to gain insight into trends in food and beverage advertising to children. Implications for future regulatory policy were considered.

Material findings
The analysis showed that recent changes to the codes appear to have weakened the protections in place for children. Two important developments highlighted were: the narrowing of the definition of advertising that is considered “directed primarily to children”, with findings suggesting the rules are increasingly permissive of a range of child-oriented techniques; and the change whereby advertisers themselves now define the criteria by which products are assessed to be “healthier” (and therefore able to be advertised to children). Australia’s self-regulatory system governing food and beverage advertising to children is not consistent the WHO Set of Recommendations on the marketing of foods and non-alcoholic beverages to children 2010.

Conclusions
The analysis suggests that the protections afforded by self-regulation of advertising have been eroded by amendments made unilaterally to the voluntary codes by advertisers. These observations add to the growing imperative to improve controls on advertising food to children in Australia.
Modified Shuttle Test-Paeds: a valid cardiorespiratory fitness measure for children
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Introduction: A primary barrier to measuring cardiorespiratory fitness (CRF) in school-aged children is the lack of accepted and suitable measures that don’t encourage “drop-out” for test completion and are cost and time effective. This study aimed to: 1) Test the concurrent validity of the Modified Shuttle Test-Paeds (MSTP) as a measure of CRF in children, against the gold standard reference - VO2peak relative to body mass; 2) Contrast the strength of the relation between the MSTP and VO2peak compared to the relation between the 20m Multi-Stage-Running-Test (MSRT) and VO2peak; 3) Determine whether the MSTP is a more valid indicator of CRF in children who are overweight or obese compared to those who are not.

Methods: A concurrent validation study design utilising a convenience sample of 25 school-aged children (age: 6-16 yr; male/female: 19/5; BMI: 21 ± 9 kg/m2), was employed. Physical measures included: Motor Proficiency (BOT2), VO2peak, 20mMSRT and MSTP.

Results: Mean aerobic fitness results included; VO2 peak (mL/kg/min): 43.8 ± 11.2, 20m MSRT (level) 5.48 ± 2.96; MSTP (no.): 22.10 ± 3.05. Significant and high correlations existed between VO2peak and MSTP (r2 = 0.749, p = 0.00) and these relationships were strengthened for children who are overweight or obese (r2 = 0.834, p = 0.011).

Conclusion: The MSTP is a valid measure of aerobic fitness with a high predictive validity for estimating VO2peak in children, especially overweight and obese children, using a simple equation that is clinically applicable. The MSTP may be considered as an alternative measure for predicting VO2peak, especially in environments where there are sensitivities to measuring CRF of children with diverse fitness abilities (e.g. school environments).

Measuring the ‘healthiness’ of food outlet types in Australian suburbs’ community food environment
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The availability and accessibility of food outlets, together with quality of the food available therein, appear to impact on food choices and dietary patterns among neighbourhood residents. Classifying food outlets as more healthy or less healthy can help evaluate the nature of the ‘healthiness’ of the food environment in these neighbourhoods. 24 different food outlet types were identified from an observational audit of Australian suburbs’ food environments. A purpose-designed questionnaire was developed to obtain expert opinion on the relative healthiness of food outlet types using Delphi method with two survey rounds. At the beginning of the Delphi survey, original scores were proposed for each food outlet type based on available literature, classifying them into 5 categories of ‘healthiness’. Median scores for food outlet types from Rounds 1 and 2 were highly correlated with the originally proposed scores (0.97 and 0.96 respectively, p = 0.01). A ‘healthiness’ score is proposed using the median scores of round 2 of this survey to compare food environment across Australian suburbs; and further studies can explore relationships between the suburbs’ ‘healthiness’ score and diet habits of the suburbs population.

Whanau Pakari: perception versus reality – how active are obese New Zealand children?
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Whanau Pakari is a multi-disciplinary intervention programme for obese children and adolescents in Taranaki, targeting Maori and those in most deprived areas, who are over-represented in obesity statistics.

Aim: To assess perceived versus actual activity level at initial assessment, and compare activity levels of participants with national data.

Methods: Baseline assessments from January 2012 to August 2014 were reviewed. Referral criteria were overweight or obese, age 5-16 years. Participants completed the Children’s Physical Activity Questionnaire (C-PAQ)2 and were requested to wear an ActiGraph GT3X accelerometer during waking hours for two week days and one weekend day.

Results: 240 baseline assessments were analysed. C-PAQ questionnaires were available for 235 participants, and accelerometer data for 137. Maori was the self-identified ethnicity for 109 (45%), New Zealand European (NZE) for 109 (45%), Pacific Island for 6 (3%), and other ethnic groups for 10 (4%).

There was no significant difference between average actual physical activity levels[(moderate to very vigorous activity)] between Maori and NZE (39 minutes vs. 37 minutes, p=0.8), which is lower than the national average of 104 minutes3, and lower than the recommended 60 minutes per day of moderate to very vigorous activity for children4.
Average screen time per weekday trended to be lower in Maori compared with NZE (142 vs. 158 minutes respectively, p=0.08). National guidelines recommend no more than 120 minutes per day. Conclusion: In obese children aged 5 to 16 years perceived overall activity underestimates actual activity levels. In these obese children neither duration of moderate to very vigorous activity levels nor of screen time met the currently recommended levels.

2. CPAQ - http://www.mrc-epid.cam.ac.uk/files/2013/05/CPAQ.pdf

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### Evaluation of the LiveLighter “Sugary Drinks” mass media campaign

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**Background:** The Western Australian 2013-14 LiveLighter “Sugary Drinks” campaign graphically depicts visceral fat around vital organs and focuses on the contribution of sugar-sweetened beverage (SSB) consumption to the development of toxic fat and ultimately disease. The evaluation aimed to measure campaign recall and appraisal and to determine the population impact on beliefs, intentions and behaviour with regard to SSB consumption. Also, to monitor potential unintended consequences of the campaign.

**Method:** A cohort design with a pre-campaign telephone survey of a representative sample of WA adults aged 25-49 (N=1,504), repeated following the launch (N=822) and two months later (N=557). A nonpretested sample (N=508) was incorporated to control for test effects. Multivariate logistic regression models accounting for repeated measures were tested.

**Results:** Campaign awareness of 70% was maintained despite reduced TARPs. Obese adults were more likely to be aware of the ad (80% cf. 64%), and overweight or obese adults were more likely to perceive it as self-relevant (67% cf. 29%), report a negative emotional response (44% cf. 26%) and rate it higher on measures of perceived effectiveness. The campaign was associated with increased awareness of the health consequences of excess consumption of SSB (67% cf. 88%). Despite no evidence of increased intentions to reduce consumption, there was evidence of reduced SSB intake among overweight respondents (54% cf. 47%). There was no increase in endorsement of stereotypes of overweight individuals.

**Conclusion:** Population reach compares favourably with other obesity prevention campaigns locally and internationally. The campaign performed well on outcomes previously associated with health-related intention and behaviour change, particularly among those most at risk of weight-related health problems. Further evidence that the campaign reached and resonated with the target group is found in greater campaign awareness among obese adults and reduced intake of SSB among those overweight or obese. The campaign did not unintentionally stigmatise overweight people.

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### Postpartum stress during the early postnatal period has long-lasting effects on metabolic profile in rat dams

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Stress induced during the postpartum period has been shown to exert a wide range of adverse consequences for behaviour, including depression, but less is known regarding the impact of postpartum stress on subsequent risk for metabolic disorders. Here, we modelled postpartum stress in rats using limited nesting material (LN), and tested the hypothesis that stress during the early postnatal period alters food intake, body weight and glucose and insulin homeostasis. Sprague Dawley rats were mated and dams were subjected to LN from days 2-9 using established protocols. Stressed (LN) dams were compared to control dams (unlimited bedding material) housed simultaneously in the same facility and maintained on chow diet. Food intake and body weight were measured weekly. A glucose tolerance test was conducted at 35 days, and dams were culled at 40 days postpartum. LN dams showed fragmented maternal care towards their pups with irregular nursing and eating behavior. LN dams had reduced food intake during lactation, and this persisted at 40 days postpartum (p<0.05) when they were 12% lighter compared to control dams (p<0.05). Stressed LN dams were not glucose intolerant but fasting glucose levels at cull tended to be higher compared to control dams (p=0.08) while insulin levels were 50% less than control dams (p<0.05). This finding suggests that postpartum stress induced by LN has long-lasting effects in reducing food intake and body weight. In addition, LN appears to alter glucose and insulin metabolism suggestive of altered insulin signaling.

Sleep duration and risk of overweight and obesity among Victorian Primary School children

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Background: Physical activity (PA), sedentary behaviours (SB) and dietary habits have been the main focus for prevention of childhood overweight and obesity. Recent research has proposed sleep may be another influential factor. This study explored the relationship between sleep duration, PA and SB on rates of overweight and obesity among a sample of Victorian Primary School children.

Methods: Students from 39 primary schools were recruited using a strategic random sampling technique across schools in 26 Victorian Local Government Areas. Trained researchers measured students’ heights, weights and waist circumference. BMI z-scores and weight status were calculated. Participants’ sleep duration was collected through self-report of the usual amount of hours slept pernight and were then categorised as sufficient (>10 hours) or insufficient (<10 hours) sleepers. Seven-day accelerometer was used to calculate daily light intensity PA (LPA), moderate-to-vigorous intensity PA (MVPA) and sedentary time. Participants with at least 3-days of accelerometer monitoring were included in the analyses. Multiple logistic regression analyses were used to examine the relationship between sleep duration and BMI-z, LPA, MVPA and SB with adjustments for potential confounders.

Results/Findings: The final sample comprised a total of 289 students (44% male, 56% female); mean age 11.2±1.0 years. A third (33%) were categorised as insufficient sleepers, 25% of these were overweight and 15% obese. The final adjusted regression model indicated that sleep deprivation significantly increased the risk of overweight (OR 1.8, 95% CI: 1.1-2.8) and doubled the risk of obesity (OR 2.2, 95% CI: 1.1-4.6) among primary school children.

Conclusions: This study is among the first to utilise objective measures to examine the relationship between sleep duration, PA and SB on rates of overweight and obesity among Victorian primary school children. While direction of causality remains unclear, the strong positive relationship between weight status and sleep deprivation indicates that sleep is an important area for obesity prevention.

Report of the first 50 patients attending the ACT public Obesity Management Service

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The ACT Health Obesity Management Service (OMS) saw its first patients in February 2014. It provides multidisciplinary treatment for adults with a Body Mass Index (BMI) of 40kg/m2 or more. To access to the service, patients require a referral from their General Practitioner and are then reviewed and assessed by medical and nursing staff. Initial assessment of patients assesses current risk factors and outcome measures for the service. The current study presents data pertaining to the first 50 individuals accessing the OMS to provide a baseline description of characteristics of this patient group.

Referral and attendance records were examined, in addition to indicators measured in the initial assessment. A summary of data collected at baseline will be presented including the following parameters: demographic breakdown (gender, age), anthropometry (mean Body Mass Index and mean waist circumference), and emotional well-being (PHQ-2 Depression Screening Tool and Dartmouth COOP Chart). Records relating to referral source, comorbid physical and mental health conditions, bariatric surgery status and attendance rates will also be presented, in addition to measures assessed in group education and physical activity programs. A summary of initial treatment planning in the OMS will also be presented, including total case manager assignment, referral to internal and external providers, and occasions of service in the 30 days following initial assessment. An overview of health service use records in the 12 months preceding assessment in the OMS assessing occasions of service for emergency presentations, number of admissions and total bed days, outpatient appointments, total medical and allied health specialists will also be provided.

Assessment of the first 50 patients accessing the ACT Health Obesity Management Service provides a detailed summary of patient characteristics to date. Additional case series should be examined over time to continue to understand this population and optimise assessment, treatment and evaluation methods.

Development and Implementation of an Obesity Management Service in the ACT: A Preliminary Report

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The 2011-12 Australian Health Survey revealed that 25.5% of adults in the ACT are obese. In 2013 the ACT Government released its Towards Zero Growth – Healthy Weight Initiative and an Obesity Management Service (OMS) was funded in the 2013 ACT Budget.

The OMS Model was developed through literature review, consultation with existing services in Australia and input from local stakeholders.
The OMS targets adults referred by their General Practitioner and other Medical Specialists with Class III Obesity, defined as a Body Mass Index (BMI) of 40kg/m² and above. The service provides a multidisciplinary approach to help patients identify, implement and sustain changes in health behaviour. The OMS is staffed by a Medical Specialist, Medical Registrar, Registered Nurses, Accredited Practising Dietitian, Accredited Exercise Physiologist, Physiotherapist and Clinical Psychologist, and a consumer advocate.

The OMS commenced accepting referrals in January 2014 and saw its first patients in February 2014. Patients undertake an initial assessment with medical and nursing staff and develop an Obesity Management Plan in collaboration with their Case Manager to improve their risk factor profile. Patients receive individual and/or group-based treatment programs focusing on physical activity, nutrition and psychological strategies. Patients review their progress regularly with their Case Manager and it is anticipated they will be engaged with the OMS for a minimum 12 months.

The service has been established in a new community health centre with appropriate bariatric facilities. In addition to the expected operational difficulties of commencing a new service, challenges include matching referral volume to service configuration including commencement of groups, non-attendance, refining models of case management and care coordination, interdisciplinary training and engagement with community groups to increase available resources and services in the ACT. The service is still evolving and referrals to date reinforce the importance of a specialised multidisciplinary obesity service in the ACT.

A gold bullet to treat obesity related metabolic disorders

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Objectives: Obesity is associated with chronic low grade inflammation. Adipose resident macrophages (ATMs) in obese individuals are known to produce increased levels of pro-inflammatory cytokines. We have previously shown that intraperitoneal (IP) injection of 20-30 nm gold nanoparticles (AuNPs) in lean mice can induce significant fat loss along with reduced adipose-tissue-derived, tumor necrosis factor (TNF)α mRNA expression without a concomitant change in ATM number. This study aimed to investigate whether AuNPs also reduce fat mass and metabolic disorders in mice fed a high-fat diet (HFD).

Method: Male C57BL/6 mice (6 weeks) were fed a HFD with/without daily IP injection of AuNPs (LAu 0.785 μg/g/d, HAu 7.85μg/g/d) for 9 weeks. Control group was fed standard chow with vehicle injection. IP-glucose tolerance test (IP-GTT) was performed a week before the endpoint. mRNA expression of pro-inflammatory cytokines and fat metabolic markers were determined in retroperitoneal fat and liver using real-time PCR.

Results: At the end point, body weight was similar between AuNP-treated and non-treated HFD-fed mice, but adiposity and liver weight were reduced by AuNP treatment. Blood glucose levels during IP-GTT were significantly lower in AuNP-treated mice compared to the non-treated HFD-fed group. In addition, AuNP treatment improved plasma free fatty acid, triglyceride and cholesterol levels in HFD-fed mice. In the fat tissue, mRNA expression of pro-inflammatory markers and fat metabolic markers were significantly reduced by AuNP treatment, including TNFα. In the liver, AuNP treatment downregulated inflammatory markers and improved lipid metabolic markers. Interestingly, liver mRNA expression of glucose transporter-4 was upregulated by AuNP treatment.

Conclusion: AuNPs treatment in HFD-fed mice prevented their development of glucose intolerance with improved fat metabolism and reduced inflammation in both the fat and liver. Our results therefore support the potential development of AuNPs as a new therapeutic strategy for obesity related metabolic disorders.

The association between obesity and excessive daytime sleepiness in Australian workers

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Introduction: Obesity has a wide range of negative health effects.¹ We aimed to assess whether obesity is also associated with excessive daytime sleepiness (EDS), a predictor of high mortality and morbidity.² ³

Methods: 707 participants of the Global Corporate Challenge® Evaluation Study,⁴ ⁵ an evaluation of a four-month workplace pedometer program in Melbourne, Australia, were assessed for EDS using the Epworth Sleepiness Scale (ESS). The ESS score ranges from 0 to 24, with higher score reflecting higher level of daytime sleepiness, and EDS categorised as ESS score>10. The association between obesity and EDS was analysed using multiple linear and logistic regression models, with each of the model adjusted for workplace clustering effects and potentially relevant co-factors such as demographics, diet, behavioural, psychosocial, anthropometric and biomedical factors.

Results: In this study population of Australian employees with mixed occupations (mean age 40.2±10.4 years, 40.0% males, mean BMI 26.7±4.8 kg/m²) the prevalence of EDS was 16.0%. In the multiple linear regression model, study participants who were overweight (38.3%) and obese (19.7%) were found to have significantly higher(worse) ESS scores (overweight: +0.84(95%CI 0.07 to1.61 unit), obese: +1.13(95%CI 0.12 to 2.14 unit)) than those with normal weight. In the multiple logistic regression model, being in the obese category was not associated with EDS, but being overweight increased the odds of EDS by 1.8 times (95%CI 1.0 to 3.1) when compared to having normal weight.

Conclusion/recommendation: Our result suggests that obesity is associated with an increased risk of EDS. This may represent an important pathway between obesity and increased risk of accidents, injuries and loss of productivity. Further study may assess whether this
A 'Western' dietary pattern, adiposity and inflammation: pathways to depression and mental health problems in adolescents

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Background: Observational studies suggest that dietary patterns may impact mental health outcomes, however biologically plausible pathways are yet to be tested. In this study we aimed to elucidate pathways between dietary patterns, adiposity, inflammation and mental health including depression longitudinally in a population-based cohort of adolescents.

Methods: Data were provided from 843 adolescents participating in the Western Australian Pregnancy Cohort (Raine) Study at 14 and 17 years of age. Structural equation modelling was conducted to test hypothesised models relating dietary patterns, energy intake and adiposity (body mass index) at 14 years to adiposity and the pro-inflammatory adipokine (leptin), inflammation (high sensitivity C-reactive protein – hs-CRP) at 17 years, depressive symptoms (Beck Depression Inventory) and internalising and externalising problem behaviours (Child Behaviour Check List Youth Self-Report) at 17 years. Results: The tested models provided a good fit to the data. A ‘Western’ dietary pattern (high intake of red meat, takeaway, refined foods and confectionary) at 14 years was independently associated with higher energy intake and BMI at 14 years and BMI and inflammation at 17 years. A ‘Healthy’ dietary pattern (high in fruit, vegetables, fish, whole-grains) was inversely correlated with BMI and inflammation at 17 years. Higher BMI at 14 was correlated with higher BMI, higher leptin and hs-CRP, depressive symptoms and mental health problems at 17 years.

Conclusions: A ‘Western’ dietary pattern appears to increase the risk of mental health problems including depression in adolescents.
through biologically plausible pathways of adiposity and inflammation. A ‘Healthy’ dietary pattern is protective in these pathways. Further longitudinal modelling into young adulthood is indicated to confirm these complex associations.

Central neural pathways directed to white, brown and transformed brite/beige fat

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Brown adipose tissue (BAT) is a specialized type of “fat” that is responsible for the dissipation of energy in response to either lowered ambient temperature or elevated caloric intake. The realization that BAT is present in adult humans in inverse proportion to BMI and fat mass as well as the discovery that white adipose tissue (WAT) can be transformed to “brown-like” (Brite or Beige) fat has necessitated a more complete understanding of the central neural control of BAT or “brown-like” fat cell function.

We used neurotropic viruses injected into fat depots in rats to trace multisynaptic central neural pathways directed to WAT, BAT and Brite/Beige fat. Specifically, pseudorabies virus (PRV Bartha) was injected into inguinal WAT (iWAT), interscapular BAT (iBAT) and iWAT transformed to include Brite/Beige fat cells by exposure of rats to 8°C for 7 days. After injection of PRV with different fluorescent reporters (PRV-red / PRV-green) into the various fat pads, rats were allowed to survive for 5 days to allow transport through the autonomic neuraxis before sacrifice and subsequent histological analysis to assess the distribution of transsynaptically viral-infected neurons. After injection of PRV-red or PRV-green into each of the fat depots in the same animal, distinct labeling patterns were observed in 1st, 2nd, 3rd and 4th order neurons in paravertebral ganglia, spinal cord, brain stem, midbrain and hypothalamus. In addition to these “private lines” of communication to various fat pads, populations of “command neurons” were identified which had collateral axonal projections to different fat pads including those to both brown and white fat. Moreover, the relative percentage of these “command” neurons projecting to iBAT and beiged iWAT increased under conditions of cold exposure.

These data including the unique identification of “command” controllers of fat involved with both storage and burning of energy provide a neuroanatomical basis for differentiating the central neural control of white, brown and white fat transferred into brite/beige fat.

Efficacy of the Omega-3 Index in predicting NAFLD in overweight and obese adults: a pilot study

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Background/Aims: Non-alcoholic fatty liver disease (NAFLD) is associated with overweight/obesity, and is an independent predictor of cardiovascular disease (CVD) in otherwise healthy individuals. Low intake of omega-3 polyunsaturated fatty acids (n-3 PUFA) has been associated with NAFLD, however dietary reporting and analysis has many limitations. Therefore this study aimed to examine the relationship between a new biomarker of tissue n-3 (the Omega-3 Index) and liver fat, and to assess the predictive capacity of the Omega-3 Index for fatty liver.

Methods: Eighty overweight/obese non-smoker adults (56 males) underwent proton magnetic resonance spectroscopy (1H-MRS) and MRI to measure liver fat concentration and abdominal adiposity within seven days of undergoing blood analysis and anthropometry measurements. Correlations with liver fat were examined, and linear regression for the prediction of liver fat was performed. Means±SEM are reported.

Results: Omega-3 Index was high in participants with and without NAFLD (9.0±0.3% and 8.4±0.3% respectively), and was positively correlated with liver fat (r=0.255, P=0.03). Linear regression analysis found that simple routine clinical measurements (BMI, waist circumference, age) together explained a third (33%) of the variance in liver fat, and the addition of common CVD blood markers (TG, HDL, hsCRP) increased the predictive power to 43%. However, addition of the novel Omega-3 Index, and red blood cell n-6/n-3 ratio to the model did not meaningfully or statistically improve the prediction of liver fat.

Conclusions: Against our hypothesis, the Omega-3 Index was positively correlated with liver fat. NAFLD is an important risk factor for CVD, and further research is needed to test the predictive capacity of the Omega-3 Index in higher risk populations. In healthy overweight/obese adults, simple routine clinical measurements are useful for predicting those at increased risk of NAFLD.

Funding source(s): Blackmores Ltd.; Diabetes Australia Research Trust.

Recruiting young adults into the TXT2BFIT trial for prevention of weight gain: effectiveness and cost strategies

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Funding source(s): Blackmores Ltd.; Diabetes Australia Research Trust.
Younger adults in Australia are gaining more weight and increasing waist circumference faster than other adults. Despite this, engaging 18-35 year olds in interventions aimed at prevention of weight gain is challenged by limited reporting of successful recruitment strategies. This paper describes the effectiveness and cost of recruitment strategies employed in a multi-site randomised controlled trial (RCT) testing the efficacy of a mobile-phone based program ‘TXT2BFIT’ designed to prevent weight gain among young adults. The planned protocol was to invite three Medicare Locals in the Greater Sydney Area to recruit 24 General Practitioners (GPs), with each to contribute 15 participants. However, the response was slower than previously experienced when recruiting GPs for RCTs with middle-aged adults and additional strategies were introduced. These consisted of electronic newsletters at universities; posters at universities, TAFEs and community locations; newspaper advertisements and electronic media (social and advertising) of Facebook and Google. In total, from 1181 enquiries, 250 participants were randomised. A total of 5311 letters of invitation were sent from 12 practices (16 participating GPs). One hundred thirty one patients enquired with 68 participants randomised (52% enrolment). The other recruitment methods yielded the remaining 182 randomised participants. The enrolment from print media was 26% of enquiries, from electronic 20% and from other 3%. The total cost of recruitment was $126 (AUD) per person. The least expensive modality was electronic, largely due to a free feature story on one university web homepage, whereas Facebook cost $896 per enrolment. The most expensive was print media at $98 and GPs cost $88 per enrolment. The possible disadvantage of low recruitment from GPs is that those of lower socio-economic status become underrepresented so future research will include how to better engage GPs in lifestyle interventions for young adults. News media appear to have wide reach at no cost.

### Using incentives to stimulate behavioural change

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Attempts to change individuals’ behaviour take many and varied forms, including ‘upstream’ approaches, such as laws and regulations, and ‘downstream’ approaches, such as information and education campaigns. At the heart of these behaviour change strategies is the notion of exchange – people do things to get something in return or to avoid losing something. Incentivising behaviour change is a downstream strategy that involves explicitly drawing attention to the short-term gains that can be attained by compliance with the recommended behaviour. Incentivising firmly acknowledges the importance of “What’s in it for me?” from the individual’s perspective and involves identifying relevant behavioural triggers. Programs are then developed to offer attractive and appropriate rewards for compliance with recommended behaviours. In the context of health, this strategy is becoming increasingly apparent in the health and life insurance industries. Comprehensive reward programs are being developed and offered to new and existing members. These programs act as both a source of competitive advantage relative to competitors’ offerings and a means of reducing long-term operating costs by improving members’ health. Rather than relying on complex cognitive processing of particular health problems (e.g., obesity), the possible consequences of these problems (e.g., increased risk of disease and reduced mortality), and the actions required to avoid the condition (e.g., physical activity, nutrition, and sleep), incentives work by focusing individuals’ attention on small, manageable actions and the positive outcomes that can accrue from undertaking them. The aim is therefore to bypass the often-flawed assumptions of rational decision making, and instead to cater to more emotional and hedonic needs. This presentation will outline the principles of behavioural economics that underlie the practice of incentivising and discuss these in the light of current trends in the insurance sector.

### Scope and characteristics of obesity prevention initiatives in Australia 2013

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Using incentives to stimulate behavioural change
Has the potential to exacerbate current shortfalls in consumption of milk, cheese and yogurt and/or their alternatives.

Advising patients to avoid a core food group, dairy foods, in light of the strong evidence underpinning their inclusion in the ADGs

GPs gave nutrition advice in 31% (SEM 1.4) of consultations, with 42% of GPs advising their patients to reduce their intake of

The survey revealed 30% of Australian adults were concerned consuming milk, cheese and yogurt could increase

The Australian Dietary Guidelines (ADGs) provide Australians with a dietary approach to achieve and maintain a healthy weight and reduce

The survey provides information on the scope and quality of the obesity prevention investment patterns in Australia. Geographic locations of CBIs are captured in detail by the CO-OPS interactive online map. To boost CBI quality, effectiveness and knowledge translation, further leadership and support systems are required to enable organisations to adopt upstream, evidence-informed approaches; and for effective integration of CBIs into systems, policies and environments.

Background: Dietary restraint (DR) has been implicated in both the aetiology and treatment of obesity and eating disorders. While DR is necessary for weight loss, high DR may lead to disinhibition, disordered eating, binge eating and weight gain. The present study aimed to evaluate the role of DR in a sample of obese subjects seeking treatment. It was hypothesised that compared to low and high DR, moderate DR would protect against weight gain, poor eating pattern and psychopathology.

Methods: Dietary restraint, disinhibition and hunger were measured at baseline by the TFEQ in 2496 patients (1731 female) who had attended an outpatient obesity management clinic between 1992 and 2013. We assessed their baseline anthropometry, psychological measures (DASS, BDI), eating and exercise behaviour (Food habits questionnaire and Modified Becke), medical profiles and weight loss outcomes according to their degree of dietary restraint.

Main findings: Subjects with higher DR had lower baseline weight, BMI and waist circumference. These subjects did not report increased symptoms of depression or anxiety and reported lower fat score and higher better habits score. In women, high DR was also associated with higher activity levels. Although linear regression showed that DR was a predictor of baseline weight secondary to self-esteem, it only accounted for 1.9% of the variance in baseline weight. DR did not remain predictive in men after adjusting for self-esteem. Higher baseline DR did not predict short or long term weight loss.

Conclusion: Contrary to the hypothesis, higher DR is associated with lower body weight and healthier eating and physical activity behaviours in an obese treatment seeking population with no adverse effect on depression or anxiety. Although DR is not predictive of weight loss in the short term, it is suggested that DR may be important for everyday weight maintenance.

Background and significance: Community-based interventions (CBI) that promote healthy environments are a promising strategy provided their planning and implementation is based on best practice and informed by evidence of effectiveness. In Australia, until recently, there has been a substantial political, financial and organisational investment in CBIs but their conceptualisations and lessons learned have not yet been consolidated.

Methods: The Collaboration of Community-based Obesity Prevention Sites (CO-OPS) was established as a national platform for knowledge translation and exchange among stakeholders, and has developed a regular online survey to describe the reach and characteristics of Australian CBIs, identify effective elements, and contribute to national and global monitoring.

Results: A total of 104 CBIs participated in the 2013 survey and results compared against a similar survey in 2010. Geographic location was associated with higher population density. Duration of CBIs was short-term (median 3 yrs; range 0.2 - 21.0 yrs), delivered mostly by health departments and local governments. Median annual CBI funding had more than doubled since the 2010 survey, but average staffing had not increased. CBIs used at least two strategy types, with a preference for individual behaviour change strategies. Targeting children was less common (31%) compared to the 2010 survey (57%). Logic models and theory were used in planning, but there was low use of research evidence and existing prevention frameworks. Nearly all CBIs had an evaluation component (12% of budget), but dissemination was limited.

Conclusion: This survey provides information on the scope and quality of the obesity prevention investment patterns in Australia. Geographic locations of CBIs are captured in detail by the CO-OPS interactive online map. To boost CBI quality, effectiveness and knowledge translation, further leadership and support systems are required to enable organisations to adopt upstream, evidence-informed approaches; and for effective integration of CBIs into systems, policies and environments.

Is dietary restraint deserving of a poor reputation?

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Background: The Australian Dietary Guidelines (ADGs) provide Australians with a dietary approach to achieve and maintain a healthy weight and reduce the risk of chronic diseases associated with excess weight. Yet confusion persists in both general and health professional communities on the foods to include in a balanced diet to achieve and maintain a healthy weight. A systematic review of the relationship between foods and weight status. Advising patients to avoid a core food group, dairy foods, in light of the strong evidence underpinning their inclusion in the ADGs has the potential to exacerbate current shortfalls in consumption of milk, cheese and yogurt and/or their alternatives.

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Misperceptions about dairy foods and weight – are their differences between consumers and health professionals?

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The Australian Dietary Guidelines (ADGs) provide Australians with a dietary approach to achieve and maintain a healthy weight and reduce the risk of chronic diseases associated with excess weight. Yet confusion persists in both general and health professional communities on the foods to include in a balanced diet to achieve and maintain a healthy weight. A systematic review of the relationship between foods and weight status informed the ADGs, which reports milk, cheese and yogurt are not associated with overweight and obesity in adults. With approximately 80% of adults are not meeting the ADG dairy food group recommendations, the challenge is in communicating the evidence and the guidelines. Two quantitative online surveys were conducted in Australian adults (n=1,635, 810 males) and General Practitioners (GPs) (n=300, 180 males) in March and April 2014, respectively, to understand nutrition attitudes and perceptions. The general population survey was stratified by geography, age and sex and GPs were similar to the Australian GP population for age, gender and state distribution. The survey revealed 30% of Australian adults were concerned consuming milk, cheese and yogurt could increase their weight. GPs gave nutrition advice in 31% (SEM 1.4) of consultations, with 42% of GPs advising their patients to reduce their intake of dairy foods based primarily on concerns about lactose intolerance, obesity or over consumption of dairy foods. The surveys reveal both consumers and healthcare professionals share similar misperceptions on the relationship between milk, cheese and yogurt and weight status. Advising patients to avoid a core food group, dairy foods, in light of the strong evidence underpinning their inclusion in the ADGs has the potential to exacerbate current shortfalls in consumption of milk, cheese and yogurt and/or their alternatives.
The rate of weight loss does not influence long term weight maintenance: A randomised controlled trial

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Publish consent withheld

The prevalence of food addiction as assessed by the Yale Food Addiction Scale: A systematic review

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Background: Obesity is a global epidemic and it has been suggested that an addiction to certain foods could be a factor contributing to overeating and subsequent obesity. The Yale Food Addiction Scale (YFAS) was developed in 2009 to specifically assess food addiction. Given that food addiction is a rapidly growing area of research, it is timely to review how the YFAS tool has been applied in research. This review aimed to determine the prevalence of food addiction diagnosis and symptom scores, as assessed by the YFAS.

Methods: Published studies from 2009 to July 2014 were retrieved and included if they reported YFAS outcomes including food addiction diagnosis or symptom score and were published in the English language.

Results: Twenty-five studies were identified with 88% of studies cross-sectional in nature and only one study assessing YFAS outcomes at more than one time point. Samples were predominantly female (15 studies >70% female) with a mean BMI in the overweight/obese category (60%) and age ranged from 4-90 years. Using meta-analysis, the weighted mean prevalence of YFAS food addiction diagnosis was 19.9% across studies, ranging from 5.4% to 56.7%. Food addiction was higher in adults aged >35 years (22.0%) compared to younger adults 18-35 years (17.0%). Only one study investigated food addiction in children. Food addiction diagnosis was twice as high in females compared to males (12.2% and 6.4%, respectively) and overweight/obese compared to healthy weight participants (26.9% and 14.3%, respectively). Food addiction diagnosis was three-fold higher in disordered eating samples comprised of individuals with binge eating disorder and bulimia nervosa compared to non-clinical counterparts (16.2% and 57.6%, respectively).

Conclusion: Further research is required to explore YFAS outcomes across a broader spectrum of ages, other types of eating disorders and at multiple time points to confirm the efficacy of the tool to assess for the presence of food addiction.

Is food addiction associated with specific types of food?

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Background: It has been suggested that addiction to specific foods, particularly energy-dense, hyperpalatable foods, could contribute to overeating and subsequent obesity. However, no studies have assessed what foods are potentially associated with food addiction (FA).

Methods: This study aimed to identify if specific foods were associated with FA diagnosis assessed by the Yale Food Addiction Scale (YFAS). A 178-item online survey comprised of demographics, the YFAS and the Australian Eating Survey (AES), a validated food frequency questionnaire (FFQ) that assesses dietary intake over the previous six months, was distributed to Australians aged 18-35 years via social networking sites. YFAS is a 27-item validated tool which maps the substance dependence diagnostic criteria to be applicable to eating behaviour. Participants receive an FA symptom score and potential diagnosis of FA (≥3 symptoms+clinical impairment).

Results: A total 462 predominantly female (86%), healthy weight (72.9%, mean BMI 23.2±4.5kg/m\textsuperscript{2}) individuals completed the survey. Twenty-eight participants (6.1%) met the diagnostic cut-offs for FA. Mean energy intake was 8399±2595kJ/day and did not differ by FA diagnosis. Individuals classified as food addicted had lower proportions of energy intake (%E) from protein (mean difference= -1.8%, p=0.04) and a significantly higher proportion from total fat (mean difference=1.9%, p=0.02) and saturated fat (mean difference= 1.1%, p=0.04). Those who were food addicted had a lower %E from grains (p=0.005) and breakfast cereals (p=0.002), and a higher %E from confectionary (p=0.04) and discretionary foods (p=0.046). Significant positive correlations were identified between FA symptom scores and %E from confectionary, take-away foods, and savoury packaged snacks, while negative correlations were found between FA symptom scores and %E from grains, breakfast cereals, dairy and fruit.

Conclusions: This study provides novel data that individuals with addictive-like eating behaviours consumed a greater proportion of energy from energy-dense, processed, packaged foods. Further examination of the relationship between FA, specific foods and obesity is warranted.

The double burden of malnutrition: a longitudinal, nationally representative study of Indonesian children

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Factors contributing to the success of self-directed weight loss

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Background: Research suggests that more intensive weight loss interventions are usually superior to less intense ones. However, many people appear to be capable of losing weight with limited or no professional contact. Self-directed weight loss programs guide individuals to manage their own weight and include low intensive intervention such as general lifestyle guidance or e-Health programs that are easily accessible, cost effective and can be used by wide range of overweight and obese individuals. Successfully controlling your weight without the social support, personalised feedbacks, reminders and motivation that are part of organised weight loss programs is likely to require special skills and strategies. However to date, little attention has been paid to those individuals who were successful to manage their weight on their own and promote their health.

Objective: To identify strategies and characteristic of individuals who successfully attempted self-directed weight loss.

Method: A qualitative study through a semi-structured interview to investigate strategies and characteristic of 20 individuals (age 18-50 years) who had successful experience of losing ≥5% of their body weight in last 12 months. The interview questions addressed weight loss strategies, motivation, barriers, social support, weight loss maintenance, previous weight loss experiences and lifestyle. The Interviews are audio-taped, transcribed and coded by two persons in analysing team. After visual review, thematic analysis is undertaken using specialised software.

Results and Conclusion:
We will identify a range of characteristics and weight control approaches that were mentioned most often by those successful at self directed weight loss. Results of this study will allow us to better plan and implement the effective low intensive weight loss intervention/s.

The clinical obesity maintenance model - an evaluation

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We (Raman et al., 2013) have developed a conceptual and theoretical framework of obesity maintenance termed the Clinical Obesity Maintenance Model (COMM). We argue that psychological variables, that of executive function, habit clusters, emotional dysregulation, level of depressed mood, and health literacy (eating beliefs and attitudes about obesity) interact and impact on the overeating binge eating and sedentary obesity maintaining behaviours of those individuals who are obese. The main aim of the present study was to test how well the COMM predicts obesity maintaining behaviours in an adult community sample. Specific aims were: (a) to test the strength and direction of associations between the individual constructs of the model, and (b) the independent effects of individual model constructs on obesity maintaining behaviours. Study participants (n=100) were community volunteers who completed the following assessments and instruments: a demographic and anthropometric profile, a neuropsychological battery that included tests of executive function (e.g. Wisconsin Card Sort Test, Rey Complex Figure Test, Brief A, Trail Making Task and Digit Span), the Self Report Habit Index, the Depression Anxiety and Stress
Duodenal linoleic acid sensing lowers glucose production in rats and mice via a CCK-independent neuronal network

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The disruption in glucose homeostasis characteristic of diabetes and obesity is due partly to an increase in glucose production (GP). However, the mechanisms underlying the regulation of GP in healthy and obese/diabetic settings remain to be elucidated. A duodenal Intralipid infusion activates a duodenal PKC-δ - cholecystokinin (CCK) - CCK1 receptor - PKA neuronal signaling cascade to lower GP. Intralipid is an emulsion of fatty acids containing the highest percentage of linoleic acid (LA; polyunsaturated fatty acid) and oleic acid (OA; monounsaturated fatty acid). The relative ability of individual duodenal fatty acids to regulate GP is currently unknown, as are the potential mechanisms. Therefore, we investigated whether LA and OA lower GP when infused into the duodenum and whether they utilize similar mechanisms as Intralipid in rats and mice in vivo.

First, an intraduodenal infusion of OA or LA lowered GP during the pancreatic (basal insulin) euglycemic clamps. Second, co-infusion of duodenal OA with the CCK1 receptor inhibitor, MK-329, abolished the ability of OA to lower GP. Interestingly, co-infusion of duodenal LA with MK-329 did not block the ability of LA to lower GP. Third, anintraduodenal OA or LA infusion failed to lower GP when co-infused with the anesthetic tetracaine. Fourth, acute high fat feeding resulting in early onset obesity, disrupted the ability of duodenal OA or LA infusion to lower GP. In summary, duodenal LA and OA signaling will unveil dietary and/or pharmacological strategies to activate duodenal signaling that lower GP in diabetes and obesity.
Introduction: Weight loss interventions are traditionally delivered face-to-face. Telephone delivery may overcome some barriers to accessing face-to-face programs and provide a useful delivery modality, being ubiquitous, easy to access regardless of geographic location and suitable for long-term contact. We systematically reviewed the evidence on the effectiveness of telephone-delivered weight loss interventions (compared to control and face-to-face) in overweight and obese adults. Initial weight loss interventions and extended care interventions for weight loss maintenance were included.

Methods: A structured search of six databases was conducted for articles published until May 2013. Included studies were randomized trials evaluating interventions in adults with the primary aim to achieve weight loss (or weight loss maintenance) and with at least 50% of intervention contacts in one of the study groups delivered via telephone. Two investigators independently reviewed search results for eligible studies and extracted data. Meta-analyses were by fixed effects when studies were homogeneous or random effects (DerSimonian-Laird) when heterogeneity was present.

Results: 23 studies involving 7,321 participants were eligible. Eighteen studies (5,009 participants) evaluating initial weight loss interventions reported telephone versus control (or brief intervention) comparisons of weight loss (kg). Random effects models showed a significant benefit of telephone over control (weighted mean difference [95%CI]: -2.50 [-3.35, -1.65] kg). Five studies (1,059 participants) compared telephone with face-to-face intervention, with equivalent contact in each modality. Meta-analysis revealed no significant difference between modalities for initial weight loss (telephone – face-to-face: -0.77 [-1.77, 0.23] kg). Three studies (1,610 participants) evaluating extended care interventions reported telephone versus brief intervention comparisons of weight loss maintenance (kg). Random effects models showed significantly less weight regain with the telephone versus brief intervention: -1.68 [-2.39, -0.96] kg.

Conclusions: Evidence suggests that telephone-delivered weight loss interventions are effective and can achieve similar weight loss outcomes as those delivered face-to-face. Comparative cost-effectiveness studies are needed.

Is the banning of unhealthy foods at school canteens associated with principal influence or school policy?

Kathryn Reilly¹, Rebecca Wyse¹, Serene Yoong¹, Nicole Nathan¹

1. Hunter New England Population Health, Wallsend, NSW, Australia

Background:

Poor diet is a contributing factor to the high prevalence of overweight and obesity among Australian school children. Interventions targeting school canteens have the potential to positively influence children’s diets. Although government policies have been developed to restrict the sale of unhealthy foods, the implementation of such policies has been limited. To date, most implementation support has been targeted towards canteen managers. However, engaging principals may also be important in optimising policy implementation. This study aimed to investigate whether the exclusion of ‘red’ food items on canteen menus is associated with a high degree of principal influence or having a school nutrition policy.

Method

Primary school principals in the Hunter New England region, NSW participated in a telephone survey. The NSW Healthy Schools Canteen policy uses a traffic light system to categorise foods. Foods classified as ‘red’ are prohibited for sale. Principals were asked to identify foods over canteen menus and whether they had a school nutrition policy. Chi-square tests were conducted to determine significant associations with ‘excluding red items’.

Results

Of the 413 principals contacted to complete the survey 340 (82%) consented and 276 (67%) had an operational canteen. The exclusion of red foods from canteen menus was significantly associated with: principals having a high degree of influence on canteen menus (p<0.01), and having a school nutrition policy that supports The NSW Healthy Schools Canteen policy (p<0.02).

Discussion

These results suggest that Principal influence and supportive school policy are important factors in canteens restricting the sale of unhealthy food items and complying with government canteen policy. Therefore it is suggested that interventions should engage school principals and encourage the development of school-based policy.


The neuro-endocrinology of eating

Hendrik Rensburg¹

1. The Rensburg Clinic, Nedlands, Australia

All of the current neurobiological models of feeding behaviour are either implicitly or explicitly founded in a homeostatic/negative feedback philosophy. On closer examination it appears that these models set the trend in current thinking, but are in many ways flawed since it relies...
on this homeostatic/negative feedback as the basis for research and understanding. A more lateral approach and better understanding are called for to understand this complex system without the constraints of this theory, which borders at times on dogma. It is argued that normal expected homeostatic mechanisms do not apply to the overall consumption of food, but only to the under consumption of food, which is an important survival strategy in an erratic food supply situation. The first obstacle is that the system that causes eating behaviour has never been named or even property identified, while other systems in the body has been recognized and named, even without a full understanding of its biology and physiology. Extensive fragmented research has gone into the "eating system", but because it was not identified and named it remained largely mysterious, which attracted large numbers of psychologists who made it even more enigmatic. This system that initiates eating behaviour is identified as a dedicated neuro-endocrine biological system for the sole purpose to induce feeding behaviour. A name is proposed for this system and some research are reviewed how it functions physiologically and also pathologically. It is argued that a proper descriptive name for this system has relevance for the treatment and understanding of obesity and further research into it. It is proposed that by far the most eating behaviours are normal physiological phenomena and that only a very small percentage can be regarded as pathophagia's.

The role of GH in Obesity
Hendrik Rensburg1
1. The Rensburg Clinic, Nedlands, Australia

Hormonal factors in obesity and ageing are discussed with special reference to practical applications. The main focus will be on the role of GH and IGF-1 in catabiosis (medical name for ageing) and obesity. The original name for GH, instead of the name "Growth Hormone" is proposed to be used instead of the name GH, to enhance the understanding of its functions in adults, since the present name appears to be flawed within the framework of current knowledge. (The name "obesity" is also seriously flawed, but this can be deliberated on during another talk. Various alternatives are proposed, especially one contender] The adrenopause, menopause, somatopause and viropause are known physiological, albeit pathological consequences of ageing. A new concept is proposed namely uvenipause to enhance the understanding and treatment of catabiosis. The extensive interactions of GH with other hormones are discussed. The role of GH in the treatment of obesity is examined and it is suggested that GH and IGF-1 are under utilized in the treatment of obesity. However, it is also not used correctly. GH is not a standalone hormone and needs various other helper hormones and life style changes to perform properly in the treatment of obesity and without the latter it is argued that it can be an expensive waste of money and resources. GH controversies like side effects, endocrine suppression and cancer fears are analysed.

The role of rT3 in metabolism in obesity treatment
Hendrik Rensburg1
1. The Rensburg Clinic, Nedlands, Australia

The traditional TSH and at times a T4 are the accepted tests to determine thyroid function. However, in the case of Obesity, Insulin resistance and Leptin disturbances a patient often have a normal TSH and T4 according to the laboratory ranges, but still have symptoms of hypothyroidism. The body seems to adapt to weight loss by conserving energy. The metabolism does not know the difference between a diet and a famine, even though the person intellectually knows what they are doing, the metabolism is still in the stone age, even though we live in the space age. One of the ways its seems to do this is by causing a hypo­metabolic state by decreasing the conversion of T4 into T3 and the latter also gets blocked at receptor level. Cells in the pituitary act different than cells in the rest of the body due to Deiodinases. We live in the space age. One of the ways its seems to do this is by causing a hypo­metabolic state by decreasing the conversion of T4 into T3 and the latter also gets blocked at receptor level. Cells in the pituitary act different than cells in the rest of the body due to Deiodinases.

Systematic review of incidental physical activity community interventions: results and contribution to government strategy
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1. UNSW Australia, Sydney, NSW, Australia
2. City of Greater Geelong Council, Geelong, VIC, Australia
3. WHO Collaborating Centre for Obesity Prevention, Deakin University, Geelong, VIC, Australia

Background and significance: Increasing incidental physical activity (PA) such as active transport has substantial public health potential. We a) present results of a systematic review of community-based and community-wide incidental PA interventions and b) detail how these findings contributed to the Greater Geelong PA Strategy (The Strategy) in the City of Greater Geelong, VIC.

Methods: Data sources (Medline, Embase, PsycINFO and CINAHL) were searched along with the reference lists of identified systematic reviews and included articles. Eligibility criteria; 4+ weeks in duration; 20+ participants; community-based or community-wide; stated aim to increase incidental PA.

Major findings: a) Forty-three studies were identified from 42 original articles; 60% aimed to increase stair use compared to escalator and/or lift use; 23% aimed to increase active transport; and, 16% to increase playground energy expenditure. More than two-thirds of studies reported a significant increase in incidental PA. Accurate comparisons between studies were not possible due to substantial...
heterogeneity in study design. Critical appraisal of studies revealed that the level of bias was moderate-high in most studies (1).

Conclusions: a) Due to the heterogeneity and bias of included studies, only limited conclusions can be drawn about the effectiveness of incidental PA interventions. However, this systematic review provides a timely summary of current evidence that can be used to inform decision-makers in designing incidental PA interventions in the community. b) The Strategy has fostered an environment that supports PA and has served as a catalyst for integrating planning at a local and regional level as well as across sectors and disciplines. The Strategy adopts a whole-of-population approach and focuses on identifying interventions in facility development, policies, programs and services that are cost-effective and most likely to succeed in increasing people’s ongoing participation in PA.


New integrated approach for whole room indirect calorimetry: Accuracy and usability

Russell Rising¹, Dennis Loleng¹

1. D & S Consulting Services Inc., New York, NY, United States

Introduction: Modern whole room indirect calorimeters (WRIC) consist of large chambers of similar volumes. Quality control is difficult due to the diverse characteristics and requirements of the associated gas analysis instrumentation from various manufacturers. Moreover, software code is specific for a single sized chamber.

Methods: The WRIC lab at St. Luke’s Hospital Obesity Research Center (New York City, USA) consists of a MAIN, Exercise (EX) and RMR chambers with volumes of 23,000, 10,000 and 4,500 liters, respectively. Our aim was to determine the accuracy of the new Sable Systems International Promethion Integrated (SSPI) instrumentation for WRIC of various volumes utilizing propane combustion. Propane burns at 11.92 kcal/g with a respiratory quotient \( RQ \) of 0.60. Propane burn rate (g/min) was recorded for each test. Comparisons (p<0.05) between propane stoichiometry and the SSPI instrumentation for energy expenditure (EE; kcal), \( RQ \), \( VO_2 \) and \( VCO_2 \) (l/min) were determined by independent t-test (SPSS v. 13).

<table>
<thead>
<tr>
<th>Chamber</th>
<th>N</th>
<th>Dur (h)</th>
<th>EE propane</th>
<th>EE SSPI</th>
<th>RQ SSPI</th>
<th>VO₂</th>
<th>VO₂ SSPI</th>
<th>VCO₂</th>
<th>VCO₂ SSPI</th>
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<tr>
<td>MAIN</td>
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<td>23</td>
<td>2069.6</td>
<td>2047.2</td>
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<td>442.1</td>
<td>447.8</td>
<td>265.3</td>
<td>267.8</td>
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<td></td>
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<td></td>
<td>± 313.2</td>
<td>± 314.5</td>
<td>± 0.01</td>
<td>± 66.6</td>
<td>± 70.2</td>
<td>± 39.9</td>
<td>± 38.3</td>
</tr>
<tr>
<td>MAIN</td>
<td>10</td>
<td>6</td>
<td>464.6</td>
<td>459.6</td>
<td>0.61</td>
<td>99.2</td>
<td>99.4</td>
<td>59.5</td>
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<td></td>
<td></td>
<td></td>
<td>± 110.5</td>
<td>± 108.9</td>
<td>± 0.01</td>
<td>± 24.5</td>
<td>± 23.8</td>
<td>± 14.7</td>
<td>± 14.0</td>
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<tr>
<td>RMR</td>
<td>15</td>
<td>1</td>
<td>77.8</td>
<td>77.3</td>
<td>0.61</td>
<td>16.7</td>
<td>16.7</td>
<td>10.0</td>
<td>10.2</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>± 12.1</td>
<td>± 12.3</td>
<td>± 0.01</td>
<td>± 2.6</td>
<td>± 2.7</td>
<td>± 1.6</td>
<td>± 1.7</td>
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<tr>
<td>EX</td>
<td>15</td>
<td>1</td>
<td>81.7</td>
<td>81.7</td>
<td>0.61</td>
<td>17.6</td>
<td>17.6</td>
<td>10.5</td>
<td>10.7</td>
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<td></td>
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<td></td>
<td>± 15.0</td>
<td>± 15.4</td>
<td>± 0.02</td>
<td>± 3.2</td>
<td>± 3.4</td>
<td>± 1.9</td>
<td>± 2.1</td>
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Results:
No differences existed between propane stoichiometry and the SPPI instrumentation for any of the parameters compared.

Conclusion: The SSPI instrumentation is accurate without regard to the WRIC volume, and can also be used with hoods and masks.

Policy makers and early life obesity prevention. What are the issues?

Chris Rissel¹

1. University of Sydney, Sydney, NSW, Australia

The parallel universes of academia and government bureaucracy do not always intersect. The context of early life obesity prevention from a government perspective will be discussed and a series of issues relevant to academia that inform program delivery will be highlighted. Examples of early life obesity prevention programs being implemented in NSW will be given, highlighting barriers and facilitators of scalability.

The impact of plantar callosities, arm posture, and usage of electrolyte wipes on body composition by bioelectrical impedance analysis in morbidly obese adults

Jessica Roekenes¹, 2, Magnus Strømmen³, 2, Bård Kulseng², 4, Catia Martins², 4

1. Department of Public Health and General Practice, Faculty of Medicine, Norwegian University of Science and Technology, Trondheim,
Monitoring health and dietary behaviour during participation in an online lifestyle program

Kieron B. Rooney1, Tuki Attuquaye2, Simon Thornley3, Avindra Jayewardene4, Robert Boakes4, Richard Stevenson2

1. University of Sydney, Lidcombe, NSW, Australia
2. Psychology, Macquarie University, Sydney, NSW, Australia
3. Medicine - University of Auckland, Auckland, New Zealand
4. Psychology, University of Sydney, Sydney, NSW, Australia

People increasingly engage with on-line programmes that promise health benefits. These are often based more on anecdotal experience rather than objective scientific evidence. One such programme is Sarah Wilson’s I Quit Sugar online 8 week program (IQS). While its core message of reducing sugar intake is consistent with consensus recommendations, the overall diet is inconsistent with Australian Dietary Guidelines. We therefore provided monitoring for individuals in the Sydney area who intended to enrol in IQS.

IQS subscribers were invited to undergo blood analysis of glucose, CVD risk factors and anthropometry as well as tests of cognitive function and food craving. Assessments were made prior to (T1) immediately following (T2) and 4-5 months post program (T3). Changes

Abstract

Background/Objectives: Body composition measurements derived from bioelectrical impedance analysis (BIA) are known to be affected by several variables, implying the need for standardization. The main aim of this study was to evaluate the impact of plantar callosities, arm posture, and the use of electrolyte wipes on the body composition measurements by BIA in morbidly obese adults. For validity purposes, body composition measurements from BIA were compared with those obtained from air displacement plethysmography (ADP).

Subjects/Methods: Thirty-six morbidly obese patients (13 males, 23 females, aged 28-70 years, BMI 41.6 ± 4.3 kg/m2) with moderate to severe plantar callosities were recruited for this study. Body composition was measured at a fasted state using multi-frequency BIA (InBody 720, Biospace, Korea), before and after removal of plantar callosities (pedicure), with and without InBody electrolyte wipes and with and without custom-built axillary pads. Body composition was also assessed using ADP (BodPod, Cosmed, Italy).

Results: Percentage of body fat (%BF) was found to be significantly higher with axillary pads than without (%4.6± 0.87%, p<0.001). No statistically significant differences were found in %BF pre to post pedicure, and with versus without usage of electrolyte wipes. There was also no statistically significant difference in %BF between BIA and ADP.

Conclusion: Multiple-frequency BIA (InBody 720) is a valid method for estimating %BF in morbidly obese adults. Arm posture appears to have a significant impact on %BF as assessed by BIA, as opposed to the presence of plantar callosities and usage of InBody electrolyte wipes. For clinical and scientific purposes, standardization of arm posture during BIA for body composition assessment is, therefore, recommended.

Keywords: bioelectrical impedance analysis; body composition; morbid obesity; callosities; arm posture; electrolyte wipes

Dietitian Connect: a feasibility study to evaluate the addition of video consultations with a dietitian to a web-based weight loss program.

Megan E Rollo1, Melinda J Hutchesson1, Penelope McCoy2, Clare E Collins

1. University of Newcastle, Callaghan, NSW, Australia
2. SP Health Co Pty Ltd, North Sydney, NSW, Australia

Background: Web-based weight loss programs are an effective obesity treatment approach with large reach. Adherence is a predictor of web-based program success and is influenced by the addition of contact with a health professional. This feasibility study evaluated the implementation, acceptability and preliminary efficacy of an embedded video call (VC) platform and dietitian consultations to the ClickFit weight loss program.

Methods: Initially participants were randomly allocated to one of two groups: 1) 6-week ClickFit program (CF only) or 2) 6-week ClickFit program + two dietitian video consultations (CF+VC). Early technical issues with the VC platform resulted in inconsistent use. Therefore after the first 10 participants the remainder were allocated to the CF+VC group. Clinical and behavioural variables were assessed a baseline and following program completion. Process evaluation was also undertaken.

Results: Eighteen participants (n=5 CF only; n=13 CF+VC) commenced the study (aged 21-60 years; 72% female, BMI 28.1±2.2 kg/m2), with two withdrawals (CF+VC group). Within-group changes in weight and waist circumference were significant for CF+VC completers (-2.1±1.9 kg and -4.1±3.6 cm; p<0.01) compared to CF only (-2.3±2.4 kg and -1.5±3.6 cm). Significant between-group improvements were found for the CF+VC group in overall diet quality and vegetable intake. For the CF+VC group, 70% of dietitian consultations occurred within 720, Biospace, Korea), before and after removal of plantar callosities (pedicure), with and without InBody electrolyte wipes and with and without custom-built axillary pads. Body composition was also assessed using ADP (BodPod, Cosmed, Italy).

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Conclusions: The addition of dietitian video consultations to a web-based weight loss program was acceptable and demonstrated preliminary efficacy over a 6 week period. The combination of an online program with tailored dietetic video support may address the logistical and systemic challenges associated with access to in-person obesity services. A large trial over a longer duration is required to determine the effectiveness of this treatment strategy for weight management.

This project was funded by a TechVoucher from NSW Trade and Investment and a co-contribution from SP Health Co Pty Ltd.

Keywords: bioelectrical impedance analysis; body composition; morbid obesity; callosities; arm posture; electrolyte wipes
from baseline were analysed at both T2 and T3, using repeated measure t-tests. A two-sided P-Value with alpha set at .05 was considered significant.

From an initial 82 contacts, 37 completed T1, 24 returned at T2 and 12 completed T3. At T1, the sample was 34±5.5 years with BMI of 25.2±4.5 kg/m². Significant reductions at T2 were observed in blood triglycerides (-0.15 mmol/L; 95% CI: -0.05 to -0.26), systolic blood pressure (SBP) (-6.0 mmHg; -2.5 to -7.3), BMI (-0.38 kg/m²; -0.09 to -0.68) and waist circumference (WC) (-3.4 cm; -0.89 to -5.87). Improvements were also noted in cognitive function. At T3, reductions in triglycerides (-0.15 mmol/L; -0.46 to 0.14) and WC (-3.6 cm; -0.71 to -0.06) persisted. The change in SBP reduced by half (-3.3 mmHg; -7.6 to 0.96), and BMI returned close to baseline (-0.04 kg/m²; -0.53 to 0.45). Blood glucose, Total or HDL cholesterol, fat or muscle mass did not change significantly at either endpoints. No adverse events were reported.

In a small, Sydney-based cohort completing IQS, some markers of metabolic health improved, with a subset of beneficial changes persisting up to five months after completing the program.

Lifestyle medicine from cell to community. Closing the translational gap in chronic disease treatment and prevention

Michael Sagner

Content to be provided shortly.

Changes in Body Weight and Pulse: Outcome Events in Overweight and Obese Subjects with Cardiovascular Disease


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2. NHMRC Clinical Trials Centre, University of Sydney, Sydney, Australia
3. National Centre for Cardiovascular Prevention and Outcomes, University College London, Institute for Cardiovascular Science, London, United Kingdom
4. London School of Hygiene and Tropical Medicine, London, United Kingdom
5. Special Vocational College for Handicapped Persons, Mainz, Germany
6. Catholic University of Rio de Janeiro and State Institute of Diabetes and Endocrinology, Rio de Janeiro, Brazil
7. Department of Medicine, University of Alberta, Edmonton, Canada
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9. ANMCO Research Center, Florence, Italy
10. Department of Cardiology, Gentofte University Hospital, Hellerup, Denmark

Background/Objectives: The Sibutramine Cardiovascular OUTcomes (SCOUT) trial showed a significantly increased relative risk of nonfatal cardiovascular events, but not mortality, in overweight and obese subjects receiving long-term sibutramine treatment with diet and exercise. We examined the relationship between early changes (both increases and decreases) in pulse rate, and the impact of these changes on subsequent cardiovascular outcome events.

Subjects/Methods: 9804 males and females, aged ≥55 years, with a body mass index of 27-45kg/m² were included in this current sub-analysis of the SCOUT trial. Subjects were required to have a history of cardiovascular disease and/or type 2 diabetes mellitus with at least one cardiovascular risk factor, to assess cardiovascular outcomes. The primary outcome event (POE) was a composite of: nonfatal myocardial infarction, nonfatal stroke, resuscitated cardiac arrest, or cardiovascular death. Time-to-event analyses of the POE were performed using Cox regression models.

Results: During the initial 6-week sibutramine treatment period, the induced pulse rate increase was related to weight change (1.9±7.7 bpm with weight increase; 1.4±7.3bpm, 0-5kg weight loss; 0.6±7.4bpm, ≥5kg weight loss). Throughout the subsequent treatment period, those continuing on sibutramine showed a consistently higher mean pulse rate than the placebo group. There was no difference in POE rates with either an increase or decrease in pulse rate over the lead-in period, or during lead-in baseline to 12-months post randomization. There was also no relationship between pulse rate at lead-in baseline and subsequent cardiovascular events in subjects with or without a cardiac arrhythmia.

Conclusion: Baseline pulse rate and changes in pulse rate may not be an important modifier nor a clinically useful predictor of outcome in an individual elderly cardiovascular obese subject exposed to weight management.

Publicly funded bariatric surgery in Australia. What guidance is provided by the States and Territories?

Melanie J Sharman, Martin Hensher, Stephen Wilkinson, Tim Greenaway, Julie A Nermut, Alison Venn
Background: Bariatric surgery is considered the most effective treatment option for severe obesity and associated morbidity (eg type 2 diabetes). The public health system is pressured by rising demand for primary and reoperative bariatric surgery (revisions and reversals) and associated surgeries such as body contouring. We aimed to determine the level of guidance each Australian State and Territory provides on publicly funded bariatric surgery. Methods: Bariatric surgery policies and guidelines were sought from each State and Territory and reviewed to compare their origins and level of guidance on patient eligibility and priority, and their recommendations for patient care and follow-up. Reference to the 2013 NHMRC guidelines for the management of overweight and obesity was made where appropriate. Further, data was extracted from the Australian Health Survey (AHS) to determine prevalence of severe obesity by socioeconomic status and variance in private health insurance status by BMI. Results: All states (except Queensland) but no territories had policies or guidelines directing the practice of publicly funded bariatric surgery. The documents were not uniform and not all reflected current evidence or the NHMRC guidelines. Guidance on patient prioritisation and gastric banding adjustments was limited and absent for reoperative and body contouring surgeries across all jurisdictions, including by the NHMRC. All states (except SA) recommended pre and post-surgical multidisciplinary care. Severe obesity is more prevalent when socioeconomic disadvantage is experienced and rates of private health insurance coverage declines with increasing BMI. Conclusion: The disproportionately high prevalence of severe obesity among socioeconomically disadvantaged Australians and those without private health insurance suggests high potential demand for publicly funded bariatric surgery. State policies and guidelines should be updated to reflect current evidence and the NHMRC guidelines. Greater guidance is recommended for gastric banding adjustments and on the critical policy issues of patient prioritisation, reoperative procedures and body contouring.

Reduce weight gain and Ease the pain: The impact of comorbidity of pain and obesity on interventions

Louise Sharpe

1. The University of Sydney, The University Of Sydney, NSW, Australia

There are high levels of co-morbidity between obesity and chronic pain. The evidence suggests that the co-morbidity of obesity and chronic pain complicate the treatment of either condition in isolation. That is, patients whose weight falls in the obese range do more poorly in pain management; and clients seeking treatment for obesity who are also in chronic pain lose less weight than those clients seeking weight loss who are not in pain. While there is relatively little evidence that explores this relationship, it seems clear that an increase in physical activity is a central component of both weight loss programs and chronic pain management. However, both obesity and chronic pain make physical activity more challenging. A recent study shows that when both weight loss and pain management are undertaken together, patients both lose more weight and have better outcomes in terms of disability than when either condition is treated in isolation. This talk will discuss ways in which to modify behavioural weight management programs in order to deal with chronic pain issues.

Knowledge of risks during and preparation for pregnancy: a survey of overweight and obese women

Asha Short, Lauren Bolt, Angela Newman, Rosalie M Grivell, Jodie M Dodd

1. Women's and Children's Hospital, Adelaide, South Australia, Australia
2. King's College London, School of Medicine, University of London, London, United Kingdom
3. Robinson Research Institute, Discipline of Obstetrics & Gynaecology, University of Adelaide, Adelaide, South Australia, Australia
4. The University of Adelaide, Discipline of Obstetrics & Gynaecology, Women's and Children's Hospital, Adelaide, South Australia, Australia

Background: Overweight and obesity in pregnancy are common and associated with adverse maternal and fetal outcomes. Prior maternal knowledge is a vital component for implementing successful dietary and lifestyle interventions in pregnancy but has not been described to date. The objective of this study was to assess knowledge of risks associated with overweight and obesity during pregnancy and preparation for pregnancy in women who are overweight or obese in early pregnancy.

Methods: A prospective observational study involving 150 women in early pregnancy with a Body Mass Index (BMI) >25 kg/m², who presented to a metropolitan maternity hospital. Women completed a questionnaire relating to their knowledge of recommended weight gain and pregnancy complications due to increased BMI, preparations for pregnancy and attitudes to lifestyle changes. For the purposes of analysis, women who were overweight (BMI 25.0-29.9kg/m²) were compared with women who were obese (BMI >30.0kg/m²)

Results: Women overestimated their recommended weight gain for BMI category and underestimated the risk of complications to themselves and their infants associated with increased BMI. Most women indicated an attempt to make healthy food choices in preparation for pregnancy. Women who were obese were more likely to indicate multiple attempts to diet in the preceding 12 months. All women indicated a willingness to make changes to their lifestyle to improve the health of their baby.

Conclusions: Overweight and obese women were unable to correctly identify the recommended pregnancy weight gain and risk of complications associated with increased BMI. In early pregnancy, women who are overweight or obese report a willingness to make behavioural changes to improve their health and that of their baby. Increased education and awareness prior to pregnancy and in early pregnancy is required to increase women’s knowledge which in turn may contribute to improving pregnancy outcomes with pregnancy specific dietary and lifestyle interventions.
Healthy lifestyle behaviours and intentions in adolescents from Western Sydney

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A better understanding of adolescents’ intentions to change their lifestyle behaviours is needed in building more effective health promotion strategies targeting this age group. SALSA (Students As LifeStyle Activists) is a unique peer-educational program where trained volunteer Year 10 students educate and motivate Year 8 students about healthy active living. This study reports on adolescents’ eating, physical activity and recreational screen-time behaviours, and examines their intentions around these behaviours, prior to participation in the SALSA program.

Students completed a brief online questionnaire which assessed compliance with Australian recommendations for eating breakfast, fruit and vegetable intake, physical activity and recreational screen-time. The questionnaire also assessed how frequently (in the next month) students planned to engage in these behaviours.

In total, 1,120 (52% girls) Year 8 students and 213 (69% girls) Year 10 students participated. The proportion of students [from Year 8 and Year 10 respectively] who complied with the following recommendations was: eat breakfast daily [52%; 54%]; consume ≥ 2 fruit serves daily [51%; 56%]; consume ≥ 5 vegetable serves daily [12%; 8%]; accumulate ≥ 60 minutes of moderate-vigorous physical activity daily [19%; 10%] and limit recreational screen-time to ≤ 2 hours daily [54%; 44%].

In comparison, the proportion of students [from Year 8 and Year 10 respectively] who planned to meet the same recommendations during the next month was: eating breakfast daily [65%; 72%], fruit serves [65%; 73%], vegetable serves [18%; 16%] and physical activity [70%; 75%]. One-third of Year 8 students and 38% of Year 10 students planned to engage in less recreational screen-time.

Recommendations for breakfast eating, fruit intake and recreational screen-time were met by approximately one in two adolescents. This ratio was much lower for vegetable intake and physical activity recommendations. Health promotion strategies targeting physical activity, over vegetable intake, would better align with adolescents’ behavioural intentions.

PREVIEW: PREVention of diabetes through lifestyle Intervention in Europe and around the World – Where are we now?

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Type-2 diabetes (T2D) is a global public health crisis, growing in parallel with increased prevalence of sedentary lifestyles and overweight/obesity. Observational studies and randomized clinical trials have shown that T2D is largely preventable through diet and lifestyle modifications, however the most effective diet and exercise intervention is yet to be identified. PREVIEW - PREVention of diabetes through lifestyle Intervention and population studies in Europe and around the World – is a large scale, multicentre program, recruiting overweight and obese adults and children known to be at high risk of developing T2D in 8 countries worldwide (New Zealand, Australia, Denmark, Finland, UK, Netherlands, Spain and Bulgaria). The study aims to determine whether a higher protein lower GI diet is more effective for weight loss maintenance and diabetes prevention than current international recommendations of a higher carbohydrate, moderate GI diet and will also investigate additional effects of moderate vs. higher intensity exercise. 2,500 adults and children, overweight (BMI≥25.0kg/m2) and prediabetic will be recruited. Participants complete an 8 week weight loss program using a low energy diet (LED, 4MJ/d), and those achieving ≥8% enroll into a longterm (3 year) weight loss maintenance program. Diets are ad libitum with instructions on how to achieve the macronutrient prescription. Intensive dietary and exercise counselling takes place in groups of 8-12 individuals. Blood, urine and faecal samples are collected for assessment of markers of T2D and cardiovascular disease (CVD). Behavioral modification is assessed using questionnaires. Primary endpoint is the incidence of T2D at 3 years, based on a 75g oral glucose tolerance test (OGTT). Secondary endpoints include changes in weight, % fat, insulin sensitivity, risk factors for CVD, and changes in perceived quality of life and physical activity.

Recruitment of participants started in July 2013 and will finish in February 2015. More than 50% of prediabetic adults have now been randomized and the intervention will be completed in 2018.

A pilot study investigating the dietetic weight loss interventions and 12 month functional outcomes of patients undergoing total joint replacement

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Despite poorer outcomes, numbers of obese patients undergoing hip and knee arthroplasty surgery is increasing, with more than 40% of total hip (THR) and 70% of total knee (TKR) recipients obese at the time of surgery. This pilot randomised control study investigated the effect of providing a weight loss intervention to a group of elective THR and TKR patients and compared 12-month clinical outcomes to a group receiving usual care. We hypothesized the intervention group would achieve weight loss resulting in positive outcomes on pain and function. Forty individuals with a body mass index (BMI) > 30kg/m² undergoing THR or TKR were randomised into either a treatment or control group. The treatment group received a weight loss intervention comprising at least four sessions conducted either face to face or via telephone with an Accredited Practicing Dietitian. The control group received usual care comprising healthy eating advice by a preadmission clinic nurse. At 12 months, the intervention group demonstrated significant improvements in weight related measurements; BMI, weight loss and % weight loss, compared to the control group. The control group gained weight at 12 months, +2.01kg (6.45), whereas the treatment group lost weight, -3.38kg (6.62), (p=0.015). Percentage weight change in the treatment group was -3.20% (5.24), compared to +1.67% (6.16) for the usual care group, (p=0.015) and more participants in the intervention group (45%) lost > 5% of their baseline weight compared to the usual care group (13%), (p=0.057). Physical health scores were significantly better for the intervention group compared to the usual care group, [42.2 (11.80); 32.86 (9.91), p=0.014]. This study demonstrated that a structured dietitian-led weight loss intervention in patients undergoing THR and TKR is more effective in achieving weight loss than usual care, and can result in improvement in physical health scores at 12 months post surgery.

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The Geometry of Macronutrient Balance

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Publish consent withheld

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Can a health coaching intervention prevent excessive gestational weight gain?

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Excessive gestational weight gain (GWG), defined as exceeding the recommended pregnancy weight gain for Body Mass Index (BMI), is experienced by approximately 50% of women and is associated with negative health outcomes for both the mother and baby. The primary aim of this study was to evaluate the efficacy of a Health Coaching (HC) intervention designed to prevent excessive GWG compared to a matched convenience control sample that received usual care. The secondary aim was to evaluate improvement in psychosocial, motivational and behavioural factors as a result of the HC intervention. Pregnant women were recruited from two tertiary hospitals in Melbourne, Australia. A total of 116 HC participants and 131 control participants agreed to participate in the study; 116 HC women and 127 controls returned baseline questionnaires (16-18 weeks gestation), and 81 HC and 102 controls returned follow-up questionnaires (32 weeks gestation). In addition to their usual antenatal care, women in the intervention group received four HC and two educational sessions based on health behaviour change theories; women in the control group received only their usual antenatal care. Objective weight measures were collected throughout pregnancy. Despite a trend in the data revealing that a greater percentage of control women gained weight excessively, there was no significant difference between the groups in the rate of excessive GWG after accounting for pre-pregnancy BMI, parity, baseline weeks gestation, depressive symptoms, diet and physical activity motivation, and coping skills. However, at 32 weeks gestation (post-intervention), intervention women reported greater use of active coping skills, and women who completed the full intervention also reported greater body satisfaction and vegetable intake. Therefore, a HC intervention during pregnancy may be effective at improving psychosocial and behavioural aspects of health that may lead to reduced incidence of excessive GWG. The theoretical and practical implications of this study are discussed.

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How effective was Curtin University’s Activity, Food and Attitudes Program at changing behaviours in overweight and obese adolescents?

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Aim

Interventions for overweight/obese adolescents in Australia are scarce. The aim of this study was to evaluate an intervention based on self-determination theory that targeted activity, food and attitudes in overweight/obese adolescents.

Methods

Adolescents (n=68 age=14.1 SD 1.6) and parents completed an 8-week community-based multidisciplinary intervention at 3 sites in Western Australia across 3 waves. A 12-month maintenance period followed, involving tapered telephone and SMS contact. Participants
completed anthropometric, fitness and psychological testing twice before the intervention (waitlist period), and across the 12 month maintenance period. Dietary intake was measured using 3-day food records and a questionnaire, physical activity was measured using accelerometers. Linear mixed models with repeated measures, adjusted for age at each time-point, were used to test the effects of the intervention.

Results
Following the intervention, daily junk food intake decreased by 1.4 serves (IRR=0.69, 95% confidence interval: 0.55,0.88) and daily fruit intake increased by 0.5 serves (IRR=1.8, CI:1.2, 2.6). Using a Likert scale, consumption of fast food reduced by 0.2 points (CI:-0.4,0.1) and intake of sugar-sweetened beverages reduced by 0.5 points (CI:-0.9, -0.1). Fat consumption decreased (-6.7g, CI:-10.9, -2.4) as did saturated fat consumption (-3.9, CI:-6.3, -1.6). Sedentary time decreased significantly during the intervention as compared to the waitlist period (-9.7min/day/month; CI:-18.0,-1.4) and moderate physical activity levels increased (2.6 min/day/month, CI: 0.1,5.2). Abdominal curl-up improved by 11.6/min (CI:3.4,19.8), all strength measures improved, vertical jump improved by 2.6 cm (0.9 to 4.3) and shuttle run increased by 81.3m (CI:39.8, 122.8). BMI-z score reduced (-0.008, CI:-0.2,-0.01). Health related quality of life increased (10.4 points, CI: 6.9, 19.9) and depressive feelings reduced (-1.7 points, CI:-2.9,-0.5).

Conclusions
Positive activity, food and attitude changes were observed in overweight/obese adolescent participants following participation in CAFAP.

Perceived healthy eating and physical activity factors influencing weight management in postpartum women; a mixed methods analysis.

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Background: Excessive gestational weight gain (GWG) and postpartum weight retention play a major role in long term obesity, and increase the risk of adverse health outcomes. Lifestyle interventions evaluating attainment of healthy weight postpartum have been reported. To date limited focus has been directed to investigating postpartum women’s perceptions of factors influencing weight management (WM). Our objective was to examine factors perceived to influence healthy eating (HE) and physical activity (PA) in WM for postpartum women.

Methods: An online survey was completed by 879 postpartum women (given birth in the previous 5 years) aged 18-40 years. Perceived HE and PA factors influencing WM were assessed across 20 items using a five-point Likert scale. Chi-squared tests were used to investigate differences by sub-groups (age, education, marital-status, income, pre-pregnancy BMI, parity and GWG). Two open-ended questions were asked about HE and PA strategies women had successfully implemented to address these WM factors. Responses (HE n=313, PA n=268) were analysed using Leximancer (UQ, v.4) to identify common concepts among the group and by pre-pregnancy BMI.

Results: For postpartum women (32.9±4.5 years, pre-pregnancy BMI 25.6±5.7 kg/m², 1.85±1.0 children) the most commonly reported factor influencing WM for both HE (79.4%) and PA (86.4%) was ‘food due to family commitments’. Knowledge relating to HE and PA was reported as a significantly greater influence for those with education up to certificate/apprenticeship level, compared to those with a higher university degree (61.2% vs 46.5%, p=0.02; 53.1% vs 35.4%, p=0.001, respectively). ‘Meals’ was identified as the central concept for successful HE WM strategies across all BMI groups. For PA, the central concept differed by BMI category with healthy-weight, overweight and obese groups identifying ‘kids’, ‘gym’ and ‘time’ respectively.

Conclusion: Future interventions targeting postpartum WM should address HE and PA barriers and enhancers identified by key population sub-groups.

Physiological and clinical impact of obesity in women with Polycystic Ovary Syndrome and the role of physical activity: Where to from here?

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Polycystic ovary syndrome (PCOS) is the most common endocrinopathy, affecting up to 1 in 5 young women. PCOS is a multifaceted disorder with metabolic and reproductive implications. The condition places a significant burden of the healthcare system of ~$800 million per annum. Metabolic implications include obesity, insulin resistance, gestational diabetes, type 2 diabetes mellitus and risk factors for cardiovascular disease. Insulin resistance is a central characteristic in the majority of PCOS affected women, driving the clinical features including reproductive (hyperandrogenism, anovulation and infertility) and metabolic (increased type 2 diabetes risks) and cardiovascular risk factors. Not only have women with PCOS been shown to demonstrate insulin resistance that cannot be explained by BMI or visceral fat alone, but that obesity exacerbates all the clinical features and prevalence of PCOS. Underlying mechanisms of insulin resistance remain ill-defined, contributing to the controversy over diagnostic criteria, and a lack of optimal therapies Therapeutic strategies in PCOS include medical therapy (metformin), exercise and diet-induced weight loss, which all reduce, yet do not reverse insulin resistance and fail to optimally treat PCOS. However, these approaches have provided insights into the aetiology of the condition. As such this presentation will contextualise current research in PCOS and explore the impact of obesity in this syndrome highlighting our current understanding of the molecular mechanisms of insulin resistance. Furthermore it will explore the impacts of lifestyle (diet and/or exercise) in preventing weight gain and how this evidence may inform further key research into the aetiology of PCOS and guide more effective therapies for this condition.
Comparison and synthesis of current Australian guidelines on the management of obese adult patients in General Practice

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Introduction: As more of the Australian population becomes overweight, the day to day workload of GPs includes a majority of overweight patients. In addition, overweight and obese patients often present to their GP for assistance in losing weight. The aim of this research was to identify and synthesise current Australian guidelines on the treatment of overweight and obese adults for General Practitioners.

Methods: We reviewed the current Australian guidelines for the management of overweight and obese adult patients in Primary Care. The guidelines were reviewed by three authors and recommendations were amalgamated where possible. Any discrepancies found between the guidelines were compared with best available evidence and then discussed amongst the research team.

Results: There are a number of guidelines for GPs working with overweight and obese patients. Although most guidelines focus on three main areas of: nutrition, exercise and psychological strategies, each guideline places a different emphasis on each area.

Conclusion: There are multiple Australian guidelines for the treatment of obesity by GPs, but they are not in a readily usable format for the GP setting. This synthesis of current guidelines will form the basis for developing a weight reduction program that can be delivered by GPs in Australia.

Treating overweight and obese adults in General Practice – a systematic review

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Introduction: Obesity is arguably the single most important health issue facing modern primary care. General Practitioners are on the front line caring for patients with this health issue along with the multitude of health impacts that it brings. On average Australians attend their GP 2-7 times a year and patients report high rates of feeling respected and listened to by GPs. Despite this and the acknowledged positive effect of GP involvement in health prevention current obesity management strategies require referral outside the GP environment. This project was developed to identify and understand the evidence around GP delivered interventions for obesity.

Methods: A systematic review with the following inclusion criteria: RCTs, adults, BMI over 25 and a weight loss program delivered by a Primary Care doctor in a Primary Care setting. The primary outcome was BMI measured at 2 years with reporting of adverse outcomes. We used Pubmed, PsycInfo and Cochrane Central Register of Controlled Trials.

Results: There is almost no research on strategies delivered by General Practitioners – we identified one International study, and no Australian data.

Conclusion: We will reflect upon why there is so little research on GP delivered strategies for obesity treatment.


Running Shared Medical Appointments for Diabesity

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The increasing complexity and costs of medical care are challenging the entire healthcare community to develop efficient and high quality care models. Shared Medical Appointments (SMAs) provide an innovative solution addressing access and quality of care in a setting which leverages repetition and extended visit length. The model’s success is critical on the elements flowing together creating a seamless appointment. Looking back over more than 10 years of experience at the Cleveland Clinic conducting SMAs, we can share the key essentials in the development and implementation of SMAs. Our data illustrates how SMA’s can result in increased access, improved quality of care and an enhanced patient experience. Chronic disease conditions like diabesity and the associated impact on healthcare are taking center stage. SMA’s are a care model that combines maximizing workflow efficiencies with high quality of care and are one way to address the changing needs in healthcare. It can be an exciting time in healthcare as we forge ahead to advance the care of our patients.

LiveLighter Phase II “Sugary Drinks” mass media campaign
Subcutaneous fat transplantation alleviates diet-induced glucose intolerance and inflammation in mice

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Background: Adipose tissue distribution is a major determinant of mortality and morbidity in obesity. In mice, intra-abdominal transplantation of subcutaneous adipose tissue protects against glucose intolerance and insulin resistance, but the underlying mechanisms are not well understood.

Methods: We investigated changes in adipokines, tissue-specific glucose uptake and systemic inflammation in male C57BL6/J mice implanted intra-abdominally with either inguinal (subcutaneous) or epididymal (visceral) adipose tissue and fed a high-fat diet (HFD) for up to 17 weeks. Gene expression in grafted and endogenous adipose tissues was examined by microarray, and the expression of 84 fatty liver-associated genes involved were measured using PCR arrays (Qiagen). Plasma cytokine concentrations were measured using Bioplex Pro assays (Bio-Rad).

Results: Glucose tolerance was significantly improved in mice receiving subcutaneous adipose tissue from 6 weeks after transplantation, and was observed independent of body weight, skeletal muscle glucose uptake, and plasma leptin and adiponectin concentrations. In these mice, high-fat diet-induced increases in plasma concentrations of several pro-inflammatory cytokines (tumour necrosis factor-α (TNF-α), interleukin-17 (IL-17), IL-12p70, monocyte chemoattractant protein-1 (MCP-1) and macrophage inflammatory protein-1β (MIP-1β)) were markedly suppressed, relative to sham-operated mice. Notably, plasma concentrations of IL-17 and MIP-1β were reduced from as early as 4 weeks after transplantation. Of these cytokines, differences in plasma TNF-α and IL-17 concentrations significantly predicted subsequent improvements in glucose tolerance and insulinemia in the entire group of mice (n=40). Grafted fat displayed a significant increase in glucose uptake and unexpectedly, a marked induction of skeletal muscle gene expression. Consistent with improved glucose tolerance, hepatic triglyceride accumulation was significantly attenuated in mice receiving subcutaneous fat transplants. In contrast, mice receiving additional intra-abdominal adipose tissue displayed the greatest degree of hepatic triglyceride accumulation, and uniquely elevated plasma IL-6 concentrations.

Conclusions: Intra-abdominal transplantation of subcutaneous fat has reproducible beneficial effects on glucose tolerance and systemic inflammation. Future studies will be required to identify the cell type(s) responsible for these effects, and potential sites for therapeutic intervention.
Background: Recently, thermogenic beige/brite adipocytes with potential anti-obesity effects have been isolated from rodent white adipose tissue. Beige/brite adipocytes are characterised by inducible uncoupling protein-1 (UCP1) expression, and by the cell surface markers TMEM26 and CD137 (Wu J et al. Cell 2012). In humans, beige/brite cells have been identified in several human adipose depots, including supracavicular, mediastinal, retroperitoneal and intra-abdominal fat. These cells were proposed to express the marker CITED1 (Sharp LZ et al. PLoS One 2013). We aimed to identify beige/brite cells in human fat, to examine their relationship with obesity/diabetes and to establish an in vitro model.

Subjects and Methods: Adipose tissues (omental, gastro-oesophageal (GO) fat) and abdominal subcutaneous) were obtained from 32 subjects undergoing routine abdominal surgery at SVH, Darlinghurst. This included 8 non-obese (3M/5F, BMI 21.7-27.1 kg/m²), 11 obese (2M/9F, BMI 33.9-39.9 kg/m²) and 13 severely obese (6M/7F, BMI 41.3-57.2 kg/m²) subjects. Tissues were fixed for UCP1 immunohistochemistry, and mRNA expression of thermogenic genes (UCP1, PPARGC1A) and beige/brite identity (PRDM16, TMEM26, CD137, CITED1 and TBX15) was measured by RT-PCR.

Results: Half of all GO fat samples, and 44% of omental samples had detectable multilocular UCP1+ adipocytes. Beige/brite adipocyte prevalence was not associated with BMI or diabetes. GO fat tended to express the highest levels of mRNAs encoding UCP1 (1.90-fold vs. omental fat, P=0.13) and PPARGC1A (1.99-fold vs omental fat, P=0.46); and in GO fat, the expression of these genes was significantly correlated (r=0.54, P=0.019). Of the three depots, GO fat had the highest expression of the beige/brite markers TMEM26 (2.40-fold vs. omental, P=0.035) and TBX15 (6.76-fold vs. omental, P=0.0001) and tended to have higher CD137 expression (11.9-fold vs. omental, P=0.15). TMEM26 expression in GO fat was highly correlated with UCP1 (r=0.63, P=0.0050). In contrast, CITED1 expression was not increased in GO fat (0.84-fold vs. omental, P=0.40).

Conclusion: GO fat contains an abundance of thermogenic beige/brite adipocytes, and is therefore a potential source of these cells for in vitro studies.

Smartphone applications and websites on infant feeding: A systematic analysis of quality, suitability and comprehensibility

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The prevalence of childhood obesity increased over the past three decades. Infant feeding practices have been shown to contribute to unhealthy weight gain in infants. Parents now use the internet and smartphone applications (apps) to guide them with infant feeding. Given the diversity of websites and apps on infant feeding it is important that the quality of information contained within them is assessed. This systematic analysis provides perspectives on infant feeding websites and apps originating in Australia. We conducted a systematic analysis to assess the quality, comprehensibility and suitability of smartphone apps and websites on infant feeding using developed tools. Google and Bing were used to search for websites from Australia, while iTunes for iOS and Google play store for Android were used to search for apps. Specified key words (‘baby feeding’, ‘introducing solids’) were used to screen infant feeding advice. Criteria to assess accuracy of the content was developed using the Australian Infant Feeding Guidelines. A total of 287 websites were screened, 57 met the selection criteria and 43 apps were screened; 18 were included in the analysis. Most of the websites (58%) and apps (94%) were non-commercial, some websites (21%) and only 1 app were commercial and there were 12 government websites and one broken link. The quality assessment of both websites and apps revealed a wide variation in accuracy of the infant feeding content, quality and suitability. Good quality websites and apps had wider coverage of information and higher accuracy scores than those rated as fair or poor. Two-thirds of the websites (65%) and almost half of the apps (47%) had a reading level above education grade 8. The findings of this unique analysis highlights the need for website and app developers to merge user requirements with evidence-based content to ensure that information on infant feeding is high quality.

Bone loss post bariatric-surgery is better captured with QCT than DXA and delineates predominantly trabecular loss

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Introduction

Bariatric surgery is an effective weight loss strategy for the obese population and ameliorates numerous metabolic problem. Bone loss accompanies weight loss and there is paucity of bone loss data in bariatric surgery particularly in Asian subjects. DXA (Dual X-ray absorptiometry) is the gold standard for bone density measurement however obesity and rapid weight changes can affect its accuracy. QCT is less affected by these changes. We examined 21 Asian subjects before and 1 year after bariatric surgery using DXA and central QCT (Quantitative computed tomography) to assess bone loss.

Methodology

21 Obese Asian subjects, median BMI 39.7 kg/m2, underwent bariatric surgery (sleeve gastrectomy n=10, gastric bypass n=11). Baseline and 12 month post-bariatric surgery clinical measurements, laboratory and radiology were performed (including DXA and QCT of the spine
and hip). Nutritional optimisation (including vitamin D supplementation) was done according to local practices. Univariate analysis using Fischer's exact test was employed with SPSS 21.

Results
Median weight loss was 26 kg (p<0.05) or 24.2% of baseline weight, and median BMI dropped to 29.7 kg/m2 (p<0.05). Bone loss at the spine was not significant by DXA (p=0.96), however it showed a 10.9% drop by QCT (p<0.05). At the hip, QCT showed that the cortical component was unaffected by bone loss and the trabecular component showed a drop of 3.3% (p<0.05). Median vitamin D levels rose from 23.7 mcg/L to 29.9 mcg/L with vitamin D supplementation (p<0.05), and only 2 patients were still vitamin D insufficient 1 year post bariatric surgery.

Conclusion
Bone loss accompanied effective weight loss in bariatric surgery in Asian subjects that was better captured on QCT than DXA at the spine. Trabecular bone loss was predominant in this studied population. Further studies would be needed to assess effective means of ameliorating bone loss post-bariatric surgery.


Obesity and metabolic health risks: An exploration of body mass index and waist circumference combinations

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Aim: Recent evidence suggests that a substantial subgroup of the population who have a high-risk waist circumference (WC) do not have an obese body mass index (BMI). Little is known about their health risks. This study aimed to compare the metabolic health risks across different combinations of BMI and WC categories.

Methods: In 2000, the Australian Diabetes, Obesity and Lifestyle study recruited 11,247 participants aged >25 years from across Australia. 10,659 participants with complete data were included in our analysis. Height, weight and WC were measured. Adiposity categories were defined according to BMI/WC as: non-obese/ non-obese (N/N), non-obese /obese (N/Ob), obese /non-obese (Ob/N), and obese /obese (Ob/Ob). Logistic regression was used to examine adiposity categories in relation to hypertension, diabetes, dyslipidaemia and cardiovascular disease (CVD).

Results: The mean age was 48 years, and 50% were men. The proportions of N/N, N/Ob, Ob/N and Ob/Ob were 68%, 12%, 2% and 18%, respectively. The odds for hypertension, dyslipidaemia, and diabetes were increased for those with N/Ob (1.8 (1.4, 2.2); 1.8 (1.4, 2.3); 2.6 (2.1, 3.3), respectively) and Ob/Ob (3.8 (3.3, 4.3); 4.9 (4.0, 6.1); 4.1 (3.4, 5.0), respectively) compared to those with N/N. The odds for CVD were also increased in those with N/Ob (2.7 (2.1, 3.6)) and those Ob/Ob (1.9 (1.3, 2.8)), compared to those with N/N. When stratified by sex and by age, the magnitude of the odds ratios were generally higher in women and in those aged <55 years compared to men and those aged ≥55 years.

Conclusion: Current population monitoring, which only uses BMI to assess obesity, misses a proportion of the population who are at increased risk for hypertension, diabetes, dyslipidaemia and CVD through excess adiposity. Improved identification of those at increased health risk is paramount for better prioritisation of policy and resources.

Providing additional guidance and support to parents about sleep, diet and physical activity from birth to 2 years of age: the Prevention of Overweight in Infancy study

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Considerable interest exists internationally in determining the effectiveness of obesity prevention initiatives that commence early in life. The Prevention of Overweight in Infancy (POI) study was a randomized controlled trial investigating whether additional guidance and support around sleep, breastfeeding, diet and physical activity would slow the rate of excessive weight gain from birth to two years of age. While POI is part of the Early Prevention of Overweight in Children (EPOCH) prospective meta-analysis collaboration of four similar Australasian trials, it is unique in having a sleep intervention arm and including multiparous as well as primiparous mothers. 802 women were recruited in late pregnancy and randomized to: 1) Sleep (education sessions antenatally and at 3 weeks targeting the prevention of sleep problems, followed by an intervention from 6 months postpartum targeting the treatment of sleep problems), 2) FAB (provision of a lactation consultant to promote breastfeeding to 6 months, and education sessions at 3, 5, 7, 9, 12 and 18 months targeting healthy eating, sedentary time and active play for families), 3) Combo (Sleep and FAB interventions) or 4) Control. All four groups received standard Well Child care from the provider of their choice (typically 8 consultations in the first two years of life). Retention was high with 85% of families still involved in the study at 2 years of age. Further data were collected at 3.5 years and data collection at 5 years is ongoing. Mean body mass index (BMI) did not differ at 2 years by intervention group but children in the sleep arm were significantly less likely to be obese (≥95th percentile) than those in the FAB group. FAB and Combo appeared to increase physical activity and reduce sedentary activity. Data on infant feeding, physical activity (accelerometry), sleep, and dietary intake (Food Frequency Questionnaire) will be presented.
Theory of model of care required for preventing paediatric overweight and obesity

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BACKGROUND AND CLINICAL SIGNIFICANCE: According to AIHW 3 in 5 Australian adults are overweight or obese and 1 in 4 Australian children are overweight or obese (600,000 children in age group of 5-17 yrs according to Australian Beauareau of Statistics and 12 million adults). The clinical guidelines set down by NHMRC and DOHA in 2013 clearly states the comorbidities and recommended medical approach.

DESIGN OF MODEL OF CARE: A program to prevent this evergrowing chronic condition requires two arms, one aimed at disease screening and public education for prevention of further cases. The second arm deals with limitation of morbidity and mortality of the affected individuals. The two arms can function via a three tier system of care.

METHODOLOGY AND WORK DISTRIBUTION: Education should begin in childcare and school with healthy lifestyle being a core subject. Screening and prevention should be at primary level where the general practitioner conducts mandatory and medicare retablet screening of all children and families using BMI and waist circumference to categorises to low, medium and high risk.

Medium risk individuals (overweight with no comorbidities) require intense allied health input in community. High risk individuals (obese with or without comorbidities) should be referred to Paediatrician with view of 12wk intense community based program aimed at lifestyle modification which on failing requires 12 wk in hospital program using low calorie, low energy diet.

Bariatric surgery continues to be the only definitive treatment. Children especially adolescents who have finished growing, who are obese and with comorbidities and have failed to lose weight despite paediatrician driven intense program should be considered for bariatric surgery in tertiary paediatric facility.

RESULT: A well structured free screening program should help in early detection and intervention, thereby preventing new cases. The paediatrician in peripheral hospitals and tertiary services should be involved in limiting morbidity and mortality and thereby changing the natural progression of the condition.

Bone phenotype of insulin-resistant and insulin-sensitive overweight and obese humans

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Background: The relative contribution of insulin resistance vs. adiposity in determining bone mineral density (BMD) and fracture risk in humans remains controversial. The association between BMD, bone turnover and insulin resistance in humans remains unclear.

Aim: To evaluate BMD and bone turnover markers (BTM) in a cohort of lean (n=19), overweight/obese insulin-sensitive (Ob-IS, n=18), overweight/obese insulin-resistant (Ob-IR, n=17) and T2D patients (n=17).

Methods: Insulin sensitivity was assessed by hyperinsulinaemic-euglycaemic clamp. Non-diabetic overweight/obese individuals were stratified to Ob-IS and Ob-IR based on median glucose infusion rate (GIR, upper vs. bottom, respectively) with separate cut-offs for men and women. Total BMD and body fat mass (FM) were assessed by DXA. BTM (osteocalcin [OC], procollagen type 1 propeptide [P1NP] and collagen type 1 cross-linked C-telopeptide [CTX]) were measured fasting and during clamp hyperinsulinaemia.

Results: Groups were gender- and age-matched (57±1 years). Ob-IS, Ob-IR and T2D were matched for FM (P>0.3). GIR was similar in lean and Ob-IS (P=1) and approximately 2-fold higher (P<0.001) than GIR measured in Ob-IR and T2D (P=0.4, Ob-IR vs. T2D). BMD was higher in all overweight/obese groups compared to lean subjects (P=0.05). Lean subjects had significantly higher fasting CTX concentrations than Ob-IR (P=0.02) and T2D (P=0.03). Similarly, fasting OC was significantly higher in lean compared with Ob-IR (P=0.04). In contrast, fasting P1NP was not different between the groups (P=0.2). In response to hyperinsulinaemia, lean individuals suppressed CTX more than both insulin-resistant groups (P=0.03 vs. Ob-IR and P=0.053 vs. T2D). Similarly, lean individuals suppressed OC significantly more than Ob-IR (P=0.04). Interestingly, P1NP concentrations were unaffected by hyperinsulinaemia (P=0.5). Fasting BTM concentrations correlated inversely with fasting insulin (P=0.04) and glucose (P=0.05) and positively with GIR (P=0.02). Change in CTX and OC with hyperinsulinaemia correlated inversely with insulin sensitivity (P=0.01).

Conclusions: These findings may explain increased fracture risk in insulin-resistant overweight/obese individuals and T2D patients. Further studies are required to elucidate the role of BTM in glucose homeostasis.

Whanau Pakari: A multi-disciplinary intervention for children and adolescents with obesity – reports of pain (including headache) and sleep duration

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TM
Obesity in children and adolescents is associated with a number of health and behaviour related concerns. Pain (including headaches) is more prevalent in obese compared with non-obese populations. There is an association between reduced sleep duration and increased risk of obesity. Quality of life ratings are lower in those who are obese.

Aim: The present study examines the self reported data concerning pain and sleep in a population of 240 children and adolescents aged 5 to 16 years referred to a multi-disciplinary intervention programme in Taranaki, New Zealand. Relevant psychometric measures were completed at study enrolment.

Method: Baseline assessments performed from January 2012 to August 2014 were reviewed. Referral criteria were BMI>98th percentile, or >91st percentile with significant weight-related co-morbidities. Self report data from participants and/or their parent was obtained which described the child/adolescent’s experience of headache, their sleep duration, and their wake and bedtimes. Psychometric measures included the Child Behavior Checklist (CBCL)1,2 and Pediatric Quality of Life Inventory (PedsQL)3 (Parent and Child versions).

Results: The mean somatic score on the CBCL was 58.48 (SD8.69). Mean child total scale score on the PedsQL was 73.95 (SD26.13). Mean parent total scale score on the PedsQL for their child/adolescent was 71.88 (SD25.29). Headaches were reported in 77 (32%) of participants. Mean sleep duration per night was 10.21 (SD 1.41) hours. Sleeping for less than 10 hours each night was reported for 69 (29%) of participants.

Conclusion: Health and behaviour rated concerns are prevalent in this population of obese children and adolescents. The clinical implications are discussed.


Macrophase inhibitory cytokine 1 (MIC-1/GDF15), a novel regulator of body weight and appetite and a potential therapeutic for obesity

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MIC-1/GDF15, a distant member of TGFβ superfamily circulates in normals at 150-1150 pg/ml. These levels can rise dramatically in diseases like advanced cancer, where it acts on appetite centres in the brain, leading to anorexia/cachexia. Further, modestly elevated levels of MIC-1/GDF15 are correlated with decreased insulin sensitivity in obese pre-diabetics or diabetic subjects, and serum levels of MIC-1/GDF15 predict the development of complications of type 2 diabetes.

To determine if MIC-1/GDF15 plays a role in physiological regulation of energy intake/expenditure, we studied MIC-1/GDF15 germline gene knockout mice (MIC-1−/−). They have increased body weight and visceral fat associated with increased food intake and, in females, reduced basal energy expenditure. Further, their body weight and food intake were corrected when MIC-1/GDF15 serum levels were raised to normal human physiological level by administration of small amounts of recombinant protein. Additionally, transgenic mice overexpressing MIC-1/GDF15 have a lean phenotype with a reduced body weight, fat and lean mass due to reduction in food intake. Importantly, under either normal or high-fat-diet, these mice had better glucose tolerance; lower insulin levels and were resistant to dietary and genetic-induced obesity.

To investigate whether MIC-1/GDF15 may also regulate energy intake in humans, we examined MIC-1/GDF15 serum levels and BMI in non-obese monozygotic twins, the use of which eliminates the effect of heritable and familial factors, and consequently increases the sensitivity of our analysis. We found that the within-twin-pair difference in serum MIC-1/GDF15 levels was strongly correlated with the within-twin-pair difference in BMI. These data suggest that MIC-1/GDF15 regulates BMI independently of genetic background, which is consistent with data obtained in mice.

Our studies suggest that MIC-1/GDF15, is a physiological as well as disease associated regulator of body weight and appetite and might be a novel therapeutic for treatment of obesity and related diseases.


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Background & Significance: Cardiorespiratory fitness (CRF) is an independent predictor of health outcomes in children and is associated
Body weight trends and physical activity levels in cancer survivors attending the Sydney Survivorship Clinic at Concord Cancer Centre

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Background
Cancer survivors experience significant ongoing health problems compared to the general population. Problems include: fatigue, pain, loss of function (musculoskeletal, cardiovascular, cardiopulmonary), infection, lymphoedema, diarrhoea, reduction in bone mass, body composition changes and neuropathy. Many cancer survivors gain weight due to adjuvant cancer therapies and supportive care medications, coupled with decreased physical activity during cancer treatment. Obesity and sedentary lifestyle are risk factors for cancer recurrence.

Method:
Adult patients with localised cancer (breast, colorectal and haematological [commenced May 2014]) after completion of primary treatments (surgery, chemotherapy and/or radiotherapy) are referred. At the initial visit patients see a multi-disciplinary team including: oncologist/haematologist, cancer nurse, dietitian, psychologist and exercise physiologist. Patients complete questionnaires assessing distress, exercise, diet and quality of life prior to attending clinic. Weight history is collected including pre-treatment, post-treatment, and at...
the clinic visit.

Results:
92 patients have attended the clinic; 78% female. Cancer diagnoses represented: breast 50%, colorectal 38%, haematological 12%. Median age 54 (range 23-80) years. 68 patients completed the Distress Thermometer (mean score 3.1/10; range 0-10); 28% scored >4, indicating distress requiring further assessment. Mean body mass index (BMI) pre- and post-treatment was 26.9kg/m2 (range15-53kg/m2) and 27.8kg/m2 (range 17-59kg/m2) respectively; >50% were overweight or obese; 76% gained weight between diagnosis and attendance at survivorship clinic (mean 3.1kg,SD4.3). Median time spent walking at time of first clinic was 180min/week, mean of 49min/week of moderate intensity PA (range 0-330min). Median weekday sitting time was 315min/day (range 60-870min).

Conclusion:
More than half the patients are overweight before starting treatment and three quarters gain weight throughout treatment. The majority of patients are not meeting recommended guidelines for moderate intensity PA and spend an average of 6 hours/day sitting. A quarter report psychological distress. The Survivorship Clinic has the potential to identify and address important lifestyle concerns for cancer survivors.

Impaired blood glucose clearance and mitochondrial function induced by high fat diet is improved by exercise and an 'exercise mimic'

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The World Health Organization predicts that by 2015, 75% of the adult population will be overweight. Exercise has known beneficial effects on the metabolic outcomes of obesity. Exercise improves metabolism by up-regulating mitochondrial activity, through increased levels of nicotinamide adenine dinucleotide (NAD+). Recent studies suggest that the NAD+ precursor nicotinamide mononucleotide (NMN) acts as an exercise mimic by increasing NAD+ levels. Several studies have demonstrated that exercise improves mitochondrial function and biogenesis in muscle. Here we compared the effects of exercise and NMN on the metabolic consequences of high-fat diet (HFD) induced obesity.

60 Female C57BL/6j mice were allocated across 5 interventions: Chow sedentary: CS; Chow exercise: CEX; HFD sedentary: HS; HFD NMN: HNMN; HFD Exercise: HEX (12/group). After 6 weeks of diet, HFD mice weighed 22% more than chow fed mice. Then the exercise groups underwent treadmill exercise (15m/min for 45 minutes), 6 days per week for 6 weeks. NMN (500mg/kg body weight) was injected (IP) every day for the last 17 days before they were sacrificed. A glucose tolerance test (GTT) (2g/kg body weight) was carried out. Mitochondrial DNA copy number was measured by quantitative PCR and citrate synthase activity was measured in quadriceps muscle.

The GTT showed that HEX and HNMN both had significantly improved plasma glucose clearance compared to the HS group. Phenotypic data showed no significant alteration to body weight due to exercise or NMN in the HFD groups. Mitochondrial copy number was significantly increased by NMN treatment but not by exercise. However, exercise, but not NMN, significantly ameliorated the HFD-induced reduction in muscle citrate synthase activity.

Overall the study showed that exercise and NMN improve glucose tolerance through different mechanisms involving mitochondria in a HFD induced obese mouse model.

The Healthy Food Environment Policy Index in New Zealand: Experts' assessments of policy gaps and priorities for the Government

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The increasing global burden of poor diet calls for comprehensive government actions to improve the healthiness of food environments, but accountability tools are lacking. The Government Healthy Food Environment Policy Index [Food-EPI] aims to fill this gap and was recently applied in New Zealand as the first systematic study, in the world, on national food policies. An Expert Panel of 52 independent public health experts rated the extent of government implementation of 42 food environment policy and infrastructure support indicators against international best practice. Their ratings were informed by validated evidence and international benchmarks. Based on the ratings, the experts recommended concrete actions and prioritized those according to their importance and achievability. For 74% of the policy and 48% of the infrastructure support indicators the level of implementation was rated as ‘low’ or ‘very little, if any’. ‘High’ implementation was achieved for providing ingredient lists and nutrient declarations and regulating health claims on packaged foods, transparency in policy development processes, and monitoring prevalence of NCDs and their risk factors. For restrictions on unhealthy food marketing to children, fiscal and food retail policies and protections of food environments from trade and investment agreements, the level of implementation was rated as ‘very little, if any’. Inter-rater reliability was 0.78 (95%CI=0.76-0.79). The experts recommended 34 actions, and prioritized seven for immediate implementation.

The Food-EPI provides a useful set of indicators sharply focusing on where government action is needed most. It is anticipated that assessing and benchmarking the extent of government policy implementation will increase accountability of governments for their actions on food environments. Countries of varying size and income are encouraged to apply the Food-EPI to stimulate government action and support civil society advocacy efforts.
Food marketing is recognized as an important factor influencing children's food preferences and consumption. The purpose of this study was to examine the nature and extent of unhealthy food marketing and non-branded food references in magazines targeted at and popular among children and adolescents 10-17 years in New Zealand. A content analysis was conducted of all food references (branded and non-branded) found in the five magazines with the highest readership among 10-17 year olds, and the three magazines (of which two were already included among the five most popular magazines) targeted to 10-17 year olds. For each of the six magazines one issue per month (n=72 issues in total) over a one-year period (December 2012-January 2014) was included. All foods referenced were classified into healthy/unhealthy according to the food-based Ministry of Health classification system. Branded food references (30% of total) were more frequently for unhealthy (43%) compared to healthy (25%) foods. Magazines specifically targeted to children and adolescents contained a significantly higher proportion of unhealthy branded food references (72%, n=51/71) compared to the most popular magazines among children and adolescents (42%, n=133/317), of which most were targeted to women. ‘Snack items’ such as chocolates and ice creams were marketed most frequently (n=104; 36%), while ‘vegetables and fruits’ were marketed the least frequently (n=9; 3%). Direct advertisements accounted for 27% of branded food references and 25% of those featured health or nutrition claims. Both branded and non-branded food references were common within magazines targeted at and popular among children and adolescents, and skewed towards unhealthy foods. This raises concerns about the effectiveness of self-regulation in marketing and emphasizes that government regulations are needed in order to curb children’s current potential high exposures to unhealthy food marketing. In addition, magazine editors could take socially responsible editorial positions in regards to healthy eating.

Making urban transport less obesogenic: The effect of a bridge on bicycle commuting

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Background
The current urban transport infrastructure forms part of the obesogenic environment in Australian cities. In advocating increased spending on active transport infrastructure, evidence for its effectiveness is needed. We used a ‘natural experiment’, the strongest research design that is feasible in practice, to examine the effect of a bridge on the cycling behaviour of commuters to a university campus.

Methods
The Eleanor Schonell (‘Green’) Bridge is the first bridge in Australia exclusively designed for buses, cyclists and pedestrians. It connects the University of Queensland (UQ) St Lucia campus, located on the left bank of Brisbane river, with suburbs on the right bank. We used data from an online questionnaire survey implemented before (2006) and after (2007) the completion of the Green Bridge to assess travel patterns of students and staff to and from the campus. We estimated the change in the proportion of commuters that travel to UQ St Lucia by bike, comparing the change over 2006 (no bridge) to 2007 (with bridge), comparing those living on the right bank (who could use the bridge in 2007) with those living on the left bank (for whom the bridge made no difference).

Findings
We found an increase in cycling on both banks, with the share of ‘bicycle only’ rising from 2.2% to 5.4% on the right bank and from 3.3% to 5.5% on the left bank. The relative probability of cycling (with 95% confidence interval) in 2007 compared to 2006 for the right and left banks were 2.50 (1.85 – 3.37) and 1.63 (1.31 – 2.04) respectively. The overall ratio of change of right over left bank was 1.53 (1.03 – 2.20), implying that the Green Bridge may have increased the proportion of cycling to work by 63%.

Concluding statement
Well-connected bikeways can increase cycling for transport.

Effects of interpretive front-of-pack nutrition labels on food purchases: Starlight randomised controlled trial.

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Background
There is substantial global evidence that interpretive front-of-pack (FOP) nutrition labels are better understood than non-interpretive numerical labels[1]. However, robust evidence on the effects of interpretive labels on consumer food purchases in the real-world is lacking.

Aim
To assess the effects of two interpretive FOP nutrition labels, compared with a standard non-interpretive numerical label, on the healthiness of consumer food purchases.
An overview of systematic reviews of obesity prevention interventions

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Informing obesity prevention interventions with evidence is challenging in a context where hundreds of systematic reviews (SRs) exist, with findings across heterogeneous interventions, populations, methods of measurement and outcomes. Further, information on implementation, sustainability, equity and harms is often unavailable in SRs due to limitations in primary research, which presents barriers to knowledge translation and effective implementation.

Since publication of the most recent Cochrane review of interventions for preventing obesity in children, a large body of relevant evidence has accumulated, including several new SRs. To ensure that any new evidence generated reflects recent developments in the field, meets stakeholders’ needs, and does not duplicate existing SRs, an overview of SRs was developed. The primary aim of the overview was to identify gaps in the methodology and scope of existing SRs that could be addressed in the update of the Cochrane Review ‘Interventions for preventing obesity in children’.

Three electronic databases were searched (DARE, Health evidence and Cochrane Library) to identify relevant SRs published between 2010 and 2014. Two reviewers conducted screening, extracted data and assessed the methodological quality of SRs using the revised version of the AMSTAR tool. To highlight gaps as well as areas of duplication, SRs were mapped according to population, intervention, outcome characteristics, overall quality and the extent that equity and public health impact were considered within reviews.

This overview of obesity prevention SRs will produce implications relevant and useful to policy and practice decision-making. Process, methods and results of this overview will be presented, highlighting gaps and duplication in the scope and methodology of existing SRs and the spectrum of quality. In addition to reconciling the evidence from the range of existing SRs, this presentation will provide recommendations for future obesity prevention research and reviews, as well as implications for policy and practice.

Sleep apnoea in children

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Sleep and metabolism are intimately linked, and sleep deprivation has a strong link to obesity. Obesity is also a known risk factor for obstructive sleep apnoea (OSA), which causes both sleep deprivation and exposure to intermittent hypoxia. The high incidence of sleep disorders amongst children with obesity means that all children presenting for weight management should be asked about their sleep habits, and symptoms of OSA (snoring, witnessed apnoea, daytime sleepiness). Studies demonstrate that links between obesity and sleep problems emerge during childhood, with OSA shown to have additional association with risks for cardiovascular disease including insulin resistance and poor cardiac response to stressors such as exercise. Management of the sleep issue can reverse the sequelae. While adenotonsillectomy may be the preferred treatment, anaesthetic risk for these children is increased, and adenotonsillectomy has lower treatment success in this population so CPAP (continuous positive airways pressure) is often the only adequate treatment although compliance has been a major barrier to the successful treatment of these children. Management of sleep hygiene has also been linked to improved weight loss. Consultation with a sleep physician and sleep studies may significantly improve the health outcomes for these children.

Time for a coffee - Nutrient composition of café chain menus

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A five-week (one week baseline and four weeks intervention), three-arm New Zealand-wide parallel randomised controlled trial commenced in August 2014. 1500 adult smartphone owners who regularly shop in a supermarket will be randomised in a 1:1:1 ratio to: 1) Traffic-light labels; 2) Health Star Rating labels; or 3) Nutrition Information Panel (control). Randomisation will be stratified by ethnicity and self-reported interest in healthy eating. All stages of the trial will be conducted remotely, online (screening) or via a bespoke smartphone application (questionnaires, randomisation, delivery of the intervention, data collection). Participants will view their allocated nutrition label via the application by scan the barcode of packaged food products using their smartphone camera. The allocated label instantly appears on the smartphone screen. Participants record all food and beverage purchases made throughout the study using the app (scanning product barcodes; photographing till receipts). The primary study outcome will be healthiness of all food purchases over the intervention period measured using mean Food Standards Australia New Zealand nutrient profiling score (difference between FOP label intervention and control arms). A number of secondary outcomes will also be evaluated.

Conclusion

This large, randomised, controlled trial will provide robust evidence of the effectiveness and potential cost-effectiveness of FOP labelling as means to improve population diets and health.

Trial registration Australian New Zealand Clinical Trials Registry (ACTRN12614000644662)
Do liver secreted factors link obesity to diabetes?

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Obesity is a risk factor for the development of secondary complications including dyslipidemia, non-alcoholic fatty liver disease, cardiovascular disease and type 2 diabetes. An accumulation of lipid in the liver, which is clinically known as hepatic steatosis, is a pathologic abnormality that is common in obese and type 2 diabetes patients. Hepatic steatosis occurs when fatty acid supply outweighs fatty acid demand and occurs in a time-course that usually precedes the induction of insulin resistance and type 2 diabetes. We hypothesised that the protein and lipid secretome is altered with the development of hepatic steatosis and that this altered secretome contributes to the development of insulin resistance. In this presentation, we describe how ‘omics’ approaches are used to delineate the hepatocyte protein and lipid secretome in health and obesity. Further, we report on the pre-clinical validation of several liver secreted factors that cause insulin resistance and disturbances in systemic metabolic homeostasis.

A map of community based obesity prevention initiatives in Australia following obesity funding 2009-2013

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To support healthy public policy and leadership at the population level, multi-component community-based initiatives (CBI) appear promising in preventing obesity, with several countries trialling this approach. In Australia all levels of government and non-government organisations have funded and facilitated a wide array of CBI aiming to prevent obesity, heterogeneous in their funding, timing, target audience and structure. This heterogeneity presents challenges for efficient collaboration and information-sharing between CBIs. The Collaboration of Community based Obesity Prevention Sites (CO-OPS) is a national knowledge translation and exchange initiative which aims to link research, policy and practice professionals to support best practice. CO-OPS established a central repository of CBI operating in Australia during 2013, to facilitate this knowledge exchange.

A comprehensive search of government, non-government and community websites was undertaken to identify currently operating CBI in Australia in 2013 using a targeted keyword search strategy. The search was supplemented with data accessed from available reports, personal communication and key informant interviews. Data were translated into an online interactive map, made publicly available for use by preventive health practitioners and other interested stakeholders.

In total 259 CBIs were identified. The location of CBI generally reflected population density, with the majority (84%) having a dual focus on physical activity and healthy eating. Few initiatives, (n=37) adopted a multi-strategy approach that combined policy implementation, built environment changes, social marketing and partnership building.

This comprehensive overview and dissemination of the location and key features of Australian CBIs may help to facilitate engagement and collaboration through knowledge exchange and information-sharing among geographically-disparate CBI practitioners, funders, communities and researchers. Together with the detailed analysis of CBI characteristics from the CO-OPS survey, evidence of current practice and potential for future improvement emerge.

An enhanced understanding of the location and key features of current CBIs highlights areas of strengths (eg dual focus) and opportunities for improvement (eg policy development) to maximise the efficiency and impact of CBI.
Conducted to determine the prevalence of overweight and obesity, inactivity and poor diet and associated care. Patients were asked about

Methods: Two-group pre-post design feasibility study. Patients who declined a 2-month group-based program were offered a 6-month telephone program. Outcomes (primary effectiveness outcome = objectively measured weight) were assessed at baseline, 2-months, and 6-months (telephone only). Changes within the telephone program were analysed by paired t-tests. Differences between the programs at 2-months were compared with linear regression models, adjusting for baseline values and confounders. The cost per healthy life year gained was calculated for both programs. Results: Fifty patients (19% of referrals) commenced the group-based program (60% female, 57.4 ± 13.5 years [mean ± SD]), with 66% completion at 2-months. Sixty-one patients (44% of eligible) commenced the telephone program (46% female; 49.3 ± 12.0 years), with 57% completion at 6-months. The telephone program achieved significant weight loss (−4.1 ± 5.0% body weight, p<0.05) at 6-months. Compared to the group-based program, the telephone program was associated with greater weight loss (mean difference [95%CI]: −2.0 [-3.4,−0.6] % body weight change; p=0.007) at 2-months. The cost per healthy life year gained was $33,000 and $85,000, for the telephone and group-based programs, respectively. Conclusions: The telephone-delivered weight management service was cost-effective, more effective for weight loss than usual (group-based) care, and reached participants who declined usual care. Exploring such alternative and broad-reaching service delivery models is important for the significant proportion of patients who remain unengaged with existing weight management services.

Characterisation of the Adiponectin Receptors: Cell-surface expression and signal transduction of AdipoR1 and AdipoR2 are palmitoylation-dependent

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The adiponectin axis is a major regulator of metabolic, cardiovascular and inflammatory tone. Current understanding of the adiponectin receptors, R1 and R2, is rudimentary constraining our ability to target these atypical seven trans-membrane receptors. Hence, we have started to characterise R1 and R2. We previously reported that R1 exhibits robust (60%) cell-surface expression (CSE) under steady-state conditions (no serum starvation) whilst R2 is undetectable and showed these differences were predicated by the non-conserved N-terminal, intracellular trunks. Here we hypothesised that (i) CSE of R1/R2 is regulated, (ii) R1/R2 are subject to palmitoylation and this regulates CSE/function (as in GPCRs). To address these hypotheses we have employed bioinformatics, cell-based and in vivo approaches. We demonstrate that (i) serum starvation increases R2 CSE and adiponectin stimulates internalisation of R1/R2 (all p<0.05). (ii) Bioinformatics analysis revealed a putative conserved ‘canonical’ palmitoylation site in the juxtamembrane region of R1(124) and R2(135), plus additional non-conserved sites. This was confirmed using mutagenesis/acyl-biotinyl exchange chemistry. Palmitoylation of R1(124) or R2(135) was shown to be required for efficient CSE of R1 and R2 and coupling to downstream signalling effectors including AMPK, AKT and ERK in cell lines and in vivo in mouse skeletal muscle respectively (all p<0.05). These results provide increasing evidence that CSE of R1 and R2 is under complex, differential regulation and is essential for coupling adiponectin to downstream signalling effectors. Further studies are required to elaborate the detailed molecular mechanisms that may provide novel therapeutic opportunities.

Preventative care strategies for common risk factors of chronic disease and musculoskeletal pain in patients waiting for specialist consultation

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Background: Overweight and obesity, physical inactivity, poor diet are primary risks of chronic disease. These behaviours have also been associated with increased risk of musculoskeletal conditions, such as low back pain and osteoarthritis. However, the provision of care to improve health risks in patient with musculoskeletal pain has not been studied.

Methods: A cross-sectional survey of 780 patients referred for specialist consultation for back, knee, hip, shoulder or neck pain was conducted to determine the prevalence of overweight and obesity, inactivity and poor diet and associated care. Patients were asked about
the willingness and preference for participation in risk modification interventions to improve their health risks.

Results: A high proportion of patients (85%) were overweight or obese (mean BMI 33.9, SD7.3), none participated in recommended levels of activity (mean leisure time activity: 65 minutes per week) or consume adequate serves or fruits and vegetables. While 93% of patients reported interest in improving these health risks, only 30% received advice about how to address them; none believed they could action the advice. Only 20% of patients were referred to a service to facilitate health risk modification. Most patients (55%) preferred telephone interventions as a mode of support.

Conclusion: There is a need to improve the implementation of strategies to address the high prevalence of overweight, inactivity and poor diet in patients referred for specialist consultation for musculoskeletal pain.

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Design and evaluation of a multi-component audit and feedback intervention for implementation of healthy food policy in school canteens

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Background: Uptake of healthy nutrition policies in school canteens nationally is poor, with many schools providing foods that are not recommended for regular sale and few providing sufficient healthy options. One promising intervention that has potential for achieving population-wide reach for school implementation of healthy nutrition policy in schools is audit and feedback.

Methods: We developed a multi-component audit and feedback intervention to provide routine service support to school canteens in rural and remote locations of the Hunter New England Local Health District. The intervention aims to increase the proportion of school canteen menus compliant with recommendations from a state-wide healthy canteen policy (Fresh Taste @ School). The interventions involves four canteen menu audits, each followed by two modes of feedback: a written feedback report and at least one telephone support call, conducted four times – approximately once per term for one year. An evaluation framework was designed to rigorously test the effectiveness of the intervention, with schools randomly allocated to receive the intervention immediately or in 12 months. To assess the difference in menu composition between groups detailed menu assessments are conducted by trained dieticians, who are blinded to group status, prior to and after the completion of the intervention.

Results: Seventy-four schools have been enrolled in the program. Baseline characterises of schools were comparable between groups. There majority of schools were government schools (80%) with 59% of all canteens reporting a profit in the preceding year. Under Fresh Tastes @ School classifications there was a mean of 7(SD6) items classified as banned or not recommended for regular sale. The majority of items (mean 30; SD14) were items that are recommended to not dominate the menu. The mean number of items encouraged for sale and which should fill the menu was 23(SD14).

Conclusion: A framework of delivery and robust evaluation for a remote support intervention for school canteens was developed. Follow up data will be available for presentation.

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Effectiveness of weight loss interventions – is there a difference between males and females: A Systematic review

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Effective strategies are required to reduce the prevalence of overweight and obesity however the effectiveness of current weight loss programs is variable. One contributing factor may be the difference in weight loss success between males and females. A systematic review was conducted to determine whether the effectiveness of weight loss interventions differs between males and females. Randomised controlled trials published up until March 2014 were included. Effect sizes (Hedge’s g) were used to examine the difference in weight loss between males and females. A total of 56 studies met eligibility criteria with 49 studies of higher quality included in the final data synthesis. Ten studies that directly compared weight loss in males and females reported a significant sex difference. Nine of these reported that males lost more weight than females however females also lost a significant amount of weight. Analysis of effect sizes found small differences in weight loss favouring males for both diet (g=0.323) and diet plus exercise (g=0.202) interventions. There is little evidence from this review to indicate that males and females should adopt different weight loss strategies. Current evidence supports moderate energy restriction in combination with exercise for weight loss in both males and females.

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Efficacy and safety of liraglutide 3.0 mg for weight management in overweight and obese adults: the SCALE Obesity and Prediabetes, a randomised, double-blind and placebo-controlled trial

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Liraglutide 3.0 mg improves body weight and cardiometabolic risk factors in overweight or obese adults without diabetes: the SCALE Obesity and Prediabetes randomised, double-blind, placebo-controlled 56-week trial

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Objective: Determine the effects of liraglutide with diet and exercise, on cardiometabolic risk factors in obese adults.

Design and intervention: Multicentre placebo-controlled double blind trial, with randomisation 2:1 to liraglutide 3 mg or placebo, stratified by pre-diabetes status. All participants received a structured diet (500 kcal/day deficit) and exercise program.

Participants: 3731 non-diabetic individuals (age >18 years, BMI ≥27 kg/m² with comorbidities, or ≥30 kg/m²) were randomised to either liraglutide 3.0 mg (n=2487) or placebo (n=1244).

Outcome measures (Week 56): Primary – weight loss; Secondary – waist circumference and other cardiometabolic risk factors. Data are estimated treatment differences (ETD) or relative difference (lipids) from model-adjusted data (ANCOVA/logistic regression) using the full

Table – Change from baseline to week 56, full analysis set, last observation carried forward

<table>
<thead>
<tr>
<th>Liraglutide (n=2432) Observed mean</th>
<th>Placebo (n=1220) Observed mean</th>
<th>Estimated treatment-difference/Odds ratio [95% CI]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight loss (%)*</td>
<td>-8.0</td>
<td>-2.6</td>
</tr>
<tr>
<td>5% responders (%)*</td>
<td>63.2</td>
<td>27.1</td>
</tr>
<tr>
<td>10% responders (%)*</td>
<td>33.1</td>
<td>10.6</td>
</tr>
<tr>
<td>Waist circumference (cm)</td>
<td>-8.2</td>
<td>-3.9</td>
</tr>
<tr>
<td>BMI (kg/m²)</td>
<td>-3.0</td>
<td>-1.0</td>
</tr>
</tbody>
</table>

*Co-primary endpoints tested hierarchically
**ANCOVA
***Logistic-regression
Conclusion

In girls, a higher vegetable protein intake was related to a higher BMI SDS [mean (95% CI), T1: 0.09 (-0.16, 0.35), T2: 0.12 (-0.14, 0.38), T3: 0.35 (0.10, 0.61); P for trend = 0.001] and FMI [mean (95% CI), T1: 14.33 (14.01, 14.65), T2: 14.44 (14.12, 14.77), T3: 14.60 (14.28, 14.92); P for trend = 0.01] adjusted for birth weight, maternal education level and maternal BMI. WHtR was lowest in girls with the moderate vegetable protein intake (P for trend = 0.04). There was no association between total/animal protein intake and body composition in girls. In boys, total/animal/vegetable protein intake was not associated with body composition.

Cross-sectional Association between Protein Intake and Body Composition among Children and Adolescents in South China

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Introduction

Several observational studies among western children and adolescents suggest that protein intake is associated with body composition. However, this issue in Chinese children remains to be determined. Our aim was to examine whether protein intake is associated with body composition among children and adolescents in South China.

Methods

1250 participants (49% boys) aged 6-16 years were cross-sectionally recruited. Daily intakes of total/animal/vegetable protein were obtained by 3-d 24h dietary recalls. Height, weight, waist circumference and skinfold thickness were measured to calculate the indices of body composition [body mass index SD score (BMI SDS), waist-to-height ratio (WHtR), percentage of body fatness (BF%), fat mass index (FMI) and fat free mass index (FFMI)]. The association between tertiles of total/animal/vegetable protein intake (T1-T3) and the BMI SDS, WHtR, BF%, FMI and FFMI was investigated using multiple linear regression analysis for girls and boys, respectively.

Results

In girls, a higher vegetable protein intake was related to a lower BMI SDS (95% CI), T1: 0.09 (-0.16, 0.35), T2: 0.12 (-0.14, 0.38), T3: 0.35 (0.10, 0.61); P for trend = 0.001] and FMI [mean (95% CI), T1: 14.33 (14.01, 14.65), T2: 14.44 (14.12, 14.77), T3: 14.60 (14.28, 14.92); P for trend = 0.01] adjusted for birth weight, maternal education level and maternal BMI. WHtR was lowest in girls with the moderate vegetable protein intake (P for trend = 0.04). There was no association between total/animal protein intake and body composition in girls. In boys, total/animal/vegetable protein intake was not associated with body composition.

Conclusion
Our results show that a higher vegetable protein intake might be related to a higher BMI SDS in girls from South China, which is primarily contributed to fat free mass.

Sex hormones, body composition and cardiometabolic health

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Testosterone concentrations are lower in older compared to younger men, and ageing is accompanied by an increasing prevalence of illness. There is ongoing debate whether changes in sex hormones are biomarkers or causal contributors to disease in ageing men. In this context the role of the testosterone metabolites dihydrotestosterone, a more potent androgen, and estradiol, a ligand for the estrogen receptor, remains unclear. Observational studies document associations of lower testosterone concentrations with higher body mass index, insulin resistance and diabetes risk. The relationship may be bidirectional, with reduced testosterone exposure contributing to adiposity and diabetes risk, while central obesity and insulin resistance impair endogenous testosterone production. Lower concentrations of testosterone or dihydrotestosterone, rather than estradiol, are associated with cardiovascular disease. Of note, in older men survival is predicted by optimal rather than high testosterone concentrations. Therefore, lower circulating androgens in men are robust biomarkers for poorer health outcomes. Testosterone therapy results in increased lean mass, higher bone mineral density and reduced fat mass in men with low-normal baseline concentrations. In men estradiol plays a major role in bone health. In addition, there is emerging evidence indicating that aromatisation of testosterone to estradiol regulates accumulation of subcutaneous and intraabdominal fat. However, completed randomised clinical trials of testosterone in men have not been powered for clinical outcomes related to incident diabetes or cardiovascular disease. Large scale randomised clinical trials are needed to clarify the utility of hormonal interventions to preserve health in the increasing population of ageing men. Pending such studies, middle-aged and older men should be encouraged to engage in healthy lifestyle behaviours, to preserve endogenous testosterone production as well as improve health outcomes.

Under 5 energize programme: Using the RE-AIM framework to evaluate reach, adoption and implementation

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The link between early life environment and long term health is well recognised1. Developing healthy food preferences and fundamental movement skills in young children will further protect against chronic disease in adulthood. Early childhood centres, where young children spend an average of 20 hours per week, provide an opportunistic environment for the translation of interventions based on evidence into improved health outcomes for children. The established (since 2004) Project Energize programme in primary schools has shown that application of the "Energize model" is associated with lower body size and increased fitness2. The model includes memoranda of understanding, stocktakes, needs analyses and action plans agreed with a designated Energizer who works with the school or centre. Under 5 Energize is a new Ministry of Health-funded programme involving 133 early childhood centres to improve maternal and child health through good nutrition and fundamental movement skill development. Evidence for effectiveness of translation of evidence into a public health programme can be evaluated using action research around five areas - reach, effectiveness, adoption, implementation and maintenance (RE-AIM)3. Progress is measured against contracted programme objectives and implementation against delivery objectives (number of visits over time, number of nutrition and physical activity sessions and review of six monthly centre driven action plans).

Under 5 Energize has reached 93% of targeted centres, 88% have signed up to the programme and 61% have adopted a nutrition and physical activity action plan since August 2013. The population reached is representative of the Waikato population and matches with the programme’s objectives and implementation against delivery objectives (number of visits over time, number of nutrition and physical activity sessions and review of six monthly centre driven action plans).


Muscle strength is reduced by an 8-week weight reducing diet in overweight and obese adults with pre-diabetes: a sub-study of the PREVIEW Study Australia

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Introduction Diet-induced weight loss is a first-line treatment for overweight and obesity, but it is often associated with loss of lean body mass. This raises questions about possible effects of diet-induced weight loss on muscle function, notably strength because of its correlations with mortality, and whether any such effects remain long term.  

Methods This clinical trial (NCT02030249) investigated the effects of an 8-week weight reducing meal replacement diet providing 3,390 kJ (810 kcal) per day on muscle strength in 77 overweight/obese (body mass index (BMI) ≥ 25 kg/m\textsuperscript{2}) pre-diabetic men and women aged 25-70 years. Handgrip strength was measured with a hydraulic hand dynamometer immediately after the weight reducing diet (8 weeks) and at 26 weeks (i.e. 4 months after completion of the diet).  

Results BMI at baseline was 37.0 ± 7.8 kg/m\textsuperscript{2}. The 8-week diet induced an average body weight loss of 11.6 ± 4.0 kg relative to baseline, and at 26 weeks weight was 12.4 ± 6.9 kg less than at baseline. Handgrip strength was significantly reduced at 8 weeks in both hands, with the effect being larger in the dominant (-1.8 ± 3.23 kg, \(p<0.005\)) than in the non-dominant hand (-0.84 ± 3.21 kg, \(p<0.05\)). Sex and age had no effect on these outcomes for handgrip strength. At the 26-week time point, handgrip strength was still reduced relative to baseline values in both the dominant and non-dominant hand.  

Conclusion Significant reductions in handgrip strength occurred after an 8-week weight reducing diet in pre-diabetic overweight and obese adults, and the effect had not dissipated at 4 months after completion of the diet. This highlights the need for long-term follow-up studies to determine whether any diet-induced reductions in muscle strength persist over time, as well as the possible long-term implications for balance and performing activities of daily living.

Technological support to enhance weight loss and weight loss maintenance among obese adults: A pilot randomised controlled trial

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Introduction: Short message service [SMS] text messaging and e-mail are emerging as cost-effective methods for improving weight management, however optimal frequency and timing are yet to be determined. This study combined a 3-month face-to-face cognitive-behavioural therapy (CBT) group program with technological support of varying types and intensity to examine changes in anthropometric, psychological and behavioural variables.  

Method: Sixty obese adults were randomised to CBT plus intensive technological support (two-way SMS and e-mail communication from 0-9 months) or CBT plus minimal technological support (one-way SMS support from 0-6 months). Assessments at baseline, 3-, 6-, 9-, and 15-months measured a range of outcomes including weight, BMI, waist circumference, binge-eating tendencies, weight self-efficacy, and weight-control cognitions and behaviours.  

Findings: Intention-to-treat analyses revealed participants in both conditions lost 4.9% of baseline weight by the end of the 3-month face-to-face program, continued to lose weight at 6-months (7.1%) and 9-months (8.8%), and maintained post-treatment gains at 15-months (7.9%). Results are comparable to traditional behavioural weight loss programs involving weekly face-to-face treatment for 24-weeks, which produce weight losses of 8-10%. Participants demonstrated significant reductions in binge-eating and frequency of problematic weight-control cognitions and behaviours, and increased confidence to abstain from non-hungry eating. No significant differences were observed between groups on any of the outcome variables.  

Conclusion: Technological support combined with CBT produced weight loss maintenance following face-to-face treatment. It was found that SMS support, which was the most cost effective and least intensive intervention (i.e., in terms of therapist time), was as effective as the more costly and intensive e-mail support, suggesting that daily SMS support is a cost-efficient way of enhancing weight outcomes.