

**A SELECTION OF TEN CURRENT READINGS ON TOPICS RELATED TO
NUTRITION AS MEDICINE**

Some available as free full-text and some requiring payment

Selection of readings made by A/Prof Goh Lee Gan

READING 1 – TYPE 2 DIABETES MELLITUS: SELF MANAGEMENT OF LIFESTYLE CHANGE

Koenigsberg MR(1), Corliss J(1). Diabetes Self-Management: Facilitating Lifestyle Change. Am Fam Physician. 2017 Sep 15;96(6):362-370.

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ABSTRACT

Healthy eating and increased physical activity can prevent or delay the onset of diabetes mellitus and facilitate diabetes management. Current guidelines recommend long-term weight loss of 5% to 7% of body weight and 150 minutes of at least moderate-intensity physical activity per week for most patients with prediabetes and diabetes.

Techniques to assess and facilitate adherence to these lifestyle changes can be practical in primary care. During office visits, physicians should assess and gradually encourage patients' readiness to work toward change.

Addressing patients' conviction and confidence can be effective in moving them toward action. Long-term goals are best separated into highly specific short-term outcome goals and achievable behavior targets.

Lifestyle goals and targets should be tailored to patients' preferences and progress while building confidence in small steps. Screening for diabetes-related attitudes, expectations, and quality of life, and addressing psychosocial factors, both favorable and unfavorable, can facilitate the likelihood of success.

Follow-up contact with patients helps maintain and expand progress by reviewing self-monitored goals, targets, and achievements; finding opportunities to encourage and empower; reviewing slips, triggers, and obstacles; and negotiating further customization of the plan.

READING 2 – TYPE 2 DIABETES MELLITUS: INTENSIVE LIFESTYLE CHANGE IN POORLY CONTROLLED HYPERGLYCEMIA

Sbroma Tomaro E(1), Pippi R(1), Reginato E(1), Aiello C(1), Buratta L(1), Mazzeschi C(1), Perrone C(1), Ranucci C(1), Tirimagni A(1), Russo A(1), Fatone C(1), Fanelli C(1), De Feo P(2). Intensive lifestyle intervention is particularly advantageous in poorly controlled type 2 diabetes. Nutr Metab Cardiovasc Dis. 2017 Aug;27(8):688-694. PubMed PMID: 28735815.

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ABSTRACT

BACKGROUND AND AIMS: It is unknown whether lifestyle change is effective in people with type 2 diabetes with inadequate glucose control. The aim of this study was to assess, in a group of people with type 2 diabetes, the impact of baseline values of glycosylated haemoglobin (HbA1c) on the effects of an intensive lifestyle intervention on metabolic, clinical and strength parameters.

METHODS AND RESULTS: 222 people with type 2 diabetes with mean \pm standard deviation baseline HbA1c of 7.50% \pm 1.27 (range 5.1-12.7%), were enrolled in a 3-month structured multidisciplinary lifestyle intervention. Anthropometric, biochemical, clinical and fitness measurements were collected at baseline, at the end of the lifestyle intervention program and at two-year follow-up visit. Significant improvements in glycometabolic control (HbA1c: $p \leq 0.0001$); anthropometric parameters (BMI $p \leq 0.0001$; waist circumference: $p \leq 0.0001$); and systemic blood pressure ($p \leq 0.0001$) were observed both at the end of the three month intensive lifestyle program and at the two-year follow up visit. In addition, defined daily doses of hypoglycaemic treatment significantly decreased ($p = 0.001$). Fitness measures exhibited significant increments in the whole sample at the end of the intensive intervention program ($p \leq 0.0001$). When patients were divided into tertiles considering the baseline value of HbA1c, the most marked improvements in HbA1c, blood glucose and triglycerides were observed in the group with inadequate glucose control (HbA1c $\geq 7.71\%$), both at the three-month and two-year follow-ups.

CONCLUSION: These results demonstrate that an intensive lifestyle intervention should be recommended for people with type 2 diabetes, particularly those with the most inadequate glycaemic control.

READING 3 – TYPE 2 DIABETES MELLITUS: EFFECT OF INTENSIVE LIFESTYLE CHANGE AND GLYCEMIC CONTROL

Johansen MY(1)(2), MacDonald CS(1)(2)(3), Hansen KB(1)(2), Karstoft K(1)(2), Christensen R(4)(5), Pedersen M(1)(2)(6), Hansen LS(1)(2), Zacho M(1)(2), Wedell-Neergaard AS(1)(2), Nielsen ST(1)(2), Iepsen UW(1)(2), Langberg H(1)(2)(3), Vaag AA(1)(2)(7), Pedersen BK(1)(2), Ried-Larsen M(1)(2)(8). Effect of an Intensive Lifestyle Intervention on Glycemic Control in Patients With Type 2 Diabetes: A Randomized Clinical Trial. JAMA. 2017 Aug 15;318(7):637-646. PubMed PMID: 28810024.

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ABSTRACT

Importance: It is unclear whether a lifestyle intervention can maintain glycemic control in patients with type 2 diabetes.

Objective: To test whether an intensive lifestyle intervention results in equivalent glycemic control compared with standard care and, secondarily, leads to a reduction in glucose-lowering medication in participants with type 2 diabetes.

Design, Setting, and Participants: Randomized, assessor-blinded, single-center study within Region Zealand and the Capital Region of Denmark (April 2015-August 2016). Ninety-eight adult participants with non-insulin-dependent type 2 diabetes who were diagnosed for less than 10 years were included. Participants were randomly assigned (2:1; stratified by sex) to the lifestyle group (n = 64) or the standard care group (n = 34).

Main Outcomes and Measures: Primary outcome was change in hemoglobin A1c (HbA1c) from baseline to 12-month follow-up, and equivalence was prespecified by a CI margin of $\pm 0.4\%$ based on the intention-to-treat population. Superiority analysis was performed on the secondary outcome reductions in glucose-lowering medication.

Results: Among 98 randomized participants (mean age, 54.6 years [SD, 8.9]; women, 47 [48%]; mean baseline HbA1c, 6.7%), 93 participants completed the trial. From baseline to 12-month follow-up, the mean HbA1c level changed from 6.65% to 6.34% in the lifestyle group and from 6.74% to 6.66% in the standard care group (mean between-group difference in change of -0.26% [95% CI, -0.52% to -0.01%]), not meeting the criteria for equivalence ($P = .15$). Reduction in glucose-lowering medications occurred in 47 participants (73.5%) in the lifestyle group and 9 participants (26.4%) in the standard care group (difference, 47.1 percentage points [95% CI, 28.6–65.3]). There were 32 adverse events (most commonly musculoskeletal pain or discomfort and mild hypoglycemia) in the lifestyle group and 5 in the standard care group.

Conclusions and Relevance: Among adults with type 2 diabetes diagnosed for less than 10 years, a lifestyle intervention compared with standard care resulted in a change in glycemic control that did not reach the criterion for equivalence, but was in a direction consistent with benefit. Further research is needed to assess superiority, as well as generalizability and durability of findings.

READING 4 – TYPE 2 DIABETES MELLITUS: PREVENTION IN WOMEN WITH PREVIOUS GESTATIONAL DIABETES MELLITUS

Moon JH(1)(2), Kwak SH(1)(2), Jang HC(1)(3). Prevention of type 2 diabetes mellitus in women with previous gestational diabetes mellitus. Korean J Intern Med. 2017 Jan;32(1):26-41. PubMed PMID: 28049284.

doi: 10.3904/kjim.2016.203. Free full text.

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ABSTRACT

Gestational diabetes mellitus (GDM), defined as any degree of glucose intolerance with onset or first recognition during pregnancy, is characterized by underlying maternal defects in the β -cell response to insulin during pregnancy.

Women with a previous history of GDM have a greater than 7-fold higher risk of developing postpartum diabetes compared with women without GDM. Various risk factors for postpartum diabetes have been identified, including maternal age, glucose levels in pregnancy, family history of diabetes, pre-pregnancy and postpartum body mass index, dietary patterns, physical activity, and breastfeeding. Genetic studies revealed that GDM shares common genetic variants with type 2 diabetes. A number of lifestyle interventional trials that aimed to ameliorate modifiable risk factors, including diet, exercise, and breastfeeding, succeeded in reducing the incidence of postpartum diabetes, weight retention, and other obesity-related morbidities.

The present review summarizes the findings of previous studies on the incidence and risk factors of postpartum diabetes and discusses recent lifestyle interventional trials that attempted to prevent postpartum diabetes.

READING 5 – SARCOPENIA: REVIEW OF AN INCREASINGLY PREVALENT DISEASE

Marty E (1), Liu Y (1), Samuel A (1), Or O (1), Lane J (2). A review of sarcopenia: Enhancing awareness of an increasingly prevalent disease. Bone. 2017 Dec; 105:276-286. PubMed PMID: 28931495.

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ABSTRACT

Sarcopenia is defined as an age associated decline in skeletal muscle mass. The pathophysiology of sarcopenia is multifactorial, with decreased caloric intake, muscle fiber denervation, intracellular oxidative stress, hormonal decline, and enhanced myostatin signaling all thought to contribute.

Prevalence rates are as high as 29% and 33% in elderly community dwelling and long-term care populations, respectively, with advanced age, low body mass index, and low physical activity as significant risk factors. Sarcopenia shares many characteristics with other disease states typically associated with risk of fall and fracture, including osteoporosis, frailty, and obesity. There is no current universally accepted definition of sarcopenia. Diagnosing sarcopenia with contemporary operational definitions requires assessments of muscle mass, muscle strength, and physical performance. Screening is recommended for both elderly patients and those with conditions that noticeably reduce physical function. Sarcopenia is highly prevalent in orthopedic patient populations and correlates with higher hospital costs and rates of falling, fracture, and mortality. As no muscle building agents are currently approved in the United States, resistance training and nutritional supplementation are the primary methods for treating sarcopenia.

Trials with various agents, including selective androgen receptor modulators and myostatin inhibitors, show promise as future treatment options. Increased awareness of sarcopenia is of great importance to begin reaching consensus on diagnosis and to contribute to finding a cure for this condition.

READING 6 – SARCOPENIA: HIGH-PROTEIN FOODS AND PHYSICAL ACTIVITY

Bradlee ML(1), Mustafa J(1), Singer MR(1), Moore LL(1). High-Protein Foods and Physical Activity Protect Against Age-Related Muscle Loss and Functional Decline. J Gerontol A Biol Sci Med Sci. 2017 Dec 12;73(1):88-94. PubMed PMID: 28549098.

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ABSTRACT

Background: Some clinical trials suggest that protein supplementation enhances the effects of resistance exercise on skeletal muscle mass (SMM); fewer studies examine the effects of diets rich in protein-source foods on SMM and functional status among community-dwelling adults.

Methods: Data from the Framingham Offspring study including diet (three-day records, exams 3 and 5), physical activity (exams 2 and 4), percent SMM (%SMM) (exams 6 and 7), and functional performance (exams 5 through 8) were used to evaluate independent and combined effects of physical activity and high-protein foods on adjusted mean %SMM (using analysis of covariance) and risk of functional decline (using Cox proportional hazard's models). Analyses were adjusted for such factors as age, education, height, smoking, and fruit and grain consumption).

Results: Higher intakes of protein-source foods (red meat, poultry, fish, dairy, and soy, nuts, seeds and legumes) were associated with higher %SMM over 9 years, particularly among women. Men and women with higher intakes of foods from animal sources had a higher % SMM regardless of activity; beneficial effects of plant-based protein foods were only evident in physically active adults. Active subjects with higher intakes of animal or plant protein-source foods had 35% lowest risks of functional decline. Among less active individuals, only those consuming more animal protein-source foods had reduced risks of functional decline (HR: 0.71; 95% CI: 0.50-1.01).

Conclusion: Higher intake of animal-protein foods, alone and especially in combination with a physically active lifestyle, was associated with preservation of muscle mass and functional performance in older adults.

READING 7 – SARCOPENIA: HEALTH OUTCOMES

Beudart C(1), Zaaria M(2), Pasleau F(3), Reginster JY(1), Bruyère O(1). Health Outcomes of Sarcopenia: A Systematic Review and Meta-Analysis. PLoS One. 2017 Jan 17;12(1):e0169548. PubMed PMID: 28095426.

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ABSTRACT

OBJECTIVE: The purpose of this study was to perform a systematic review to assess the short-, middle- and long-term consequences of sarcopenia.

METHODS: Prospective studies assessing the consequences of sarcopenia were searched across different electronic databases (MEDLINE, EMBASE, EBM Reviews, Cochrane Database of Systematic Reviews, EBM Reviews ACP Journal Club, EBM Reviews DARE and AMED). Only studies that used the definition of the European Working Group on Sarcopenia in Older People to diagnose sarcopenia were included. Study selection and data extraction were performed by two independent reviewers. For outcomes reported by three or more studies, a meta-analysis was performed. The study results are expressed as odds ratios (OR) with 95% CI.

RESULTS: Of the 772 references identified through the database search, 17 were included in this systematic review. The number of participants in the included studies ranged from 99 to 6658, and the duration of follow-up varied from 3 months to 9.8 years. Eleven out of 12 studies assessed the impact of sarcopenia on mortality. The results showed a higher rate of mortality among sarcopenic subjects (pooled OR of 3.596 (95% CI 2.96-4.37)). The effect was higher in people aged 79 years or older compared with younger subjects ($p = 0.02$). Sarcopenia is also associated with functional decline (pooled OR of 6 studies 3.03 (95% CI 1.80-5.12)), a higher rate of falls (2/2 studies found a significant association) and a higher incidence of hospitalizations (1/1 study). The impact of sarcopenia on the incidence of fractures and the length of hospital stay was less clear (only 1/2 studies showed an association for both outcomes).

CONCLUSION: Sarcopenia is associated with several harmful outcomes, making this geriatric syndrome a real public health burden.

READING 8 – DIABETES: EFFICIENCY OF LOW CARBOHYDRATE DIET

Meng Y(1), Bai H(2), Wang S(3), Li Z(4), Wang Q(5), Chen L(6). Efficacy of low carbohydrate diet for type 2 diabetes mellitus management: A systematic review and meta-analysis of randomized controlled trials. Diabetes Res Clin Pract. 2017 Sep; 131:124-131. PubMed PMID: 28750216.

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ABSTRACT

AIMS: The objective of this systematic review and meta-analysis is to assess the efficacy of Low Carbohydrate Diet (LCD) compared with a normal or high carbohydrate diet in patients with type 2 diabetes.

METHODS: We searched MEDLINE, EMBASE, and Cochrane Library database for randomized controlled trials. Researches which reported the change in weight loss, blood glucose, and blood lipid levels were included.

RESULTS: A total of 9 studies with 734 patients with diabetes were included. Pooled results suggested that LCD had a significantly effect on HbA1c level (WMD: -0.44; 95% CI: -0.61, -0.26; P=0.00). For cardiovascular risk factors, the LCD intervention significantly reduced triglycerides concentration (WMD: -0.33; 95% CI: -0.45, -0.21; P=0.00) and increased HDL cholesterol concentration (WMD: 0.07; 95% CI: 0.03, 0.11; P=0.00). But the LCD was not associated with decreased level of total cholesterol and LDL cholesterol. Subgroup analyses indicated that short term intervention of LCD was effective for weight loss (WMD: -1.18; 95% CI: -2.32, -0.04; P=0.04).

CONCLUSIONS: The results suggested a beneficial effect of LCD intervention on glucose control in patients with type 2 diabetes. The LCD intervention also had a positive effect on triglycerides and HDL cholesterol concentrations, but without significant effect on long term weight loss.

READING 9 – INSULIN ASSOCIATED WEIGHT GAIN

Brown A(1), Guess N(1)(2), Dornhorst A(3), Taheri S(3)(4)(5), Frost G(1). Insulin-associated weight gain in obese type 2 diabetes mellitus patients: What can be done? Diabetes Obes Metab. 2017 Dec; 19(12):1655-1668. PubMed PMID: 28509408.

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ABSTRACT

Insulin therapy (IT) is initiated for patients with type 2 diabetes mellitus when glycaemic targets are not met with diet and other hypoglycaemic agents. The initiation of IT improves glycaemic control and reduces the risk of microvascular complications.

There is, however, an associated weight gain following IT, which may adversely affect diabetic and cardiovascular morbidity and mortality. A 3 to 9 kg insulin-associated weight gain (IAWG) is reported to occur in the first year of initiating IT, predominantly caused by adipose tissue. The potential causes for this weight gain include an increase in energy intake linked to a fear of hypoglycaemia, a reduction in glycosuria, catch-up weight, and central effects on weight and appetite regulation. Patients with type 2 diabetes who are receiving IT often have multiple co-morbidities, including obesity, that are exacerbated by weight gain, making the management of their diabetes and obesity challenging. There are several treatment strategies for patients with type 2 diabetes, who require IT, that attenuate weight gain, help improve glycaemic control, and help promote body weight homeostasis.

This review addresses the effects of insulin initiation and intensification on IAWG, and explores its potential underlying mechanisms, the predictors for this weight gain, and the available treatment options for managing and limiting weight gain.

READING 10 – TYPE 2 DIABETES MELLITUS AND OSTEOPOROSIS: OPTIMAL TREATMENT

Paschou SA(1), Dede AD(2), Anagnostis PG(3), Vryonidou A(4), Morganstein D(2), Goulis DG(3). Type 2 Diabetes and Osteoporosis: A Guide to Optimal Management. J Clin Endocrinol Metab. 2017 Oct 1; 102(10):3621-3634.

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ABSTRACT

Context: Both type 2 diabetes (T2D) and osteoporosis are affected by aging and quite often coexist. Furthermore, the fracture risk in patients with T2D is increased.

The aim of this article is to review updated information on osteoporosis and fracture risk in patients with T2D, to discuss the effects of diabetes treatment on bone metabolism, as well as the effect of antiosteoporotic medications on the incidence and control of T2D, and to provide a personalized guide to the optimal management.

Evidence Acquisition: A systematic literature search for human studies was conducted in three electronic databases (PubMed, Cochrane, and EMBASE) until March 2017. Regarding recommendations, we adopted the grading system introduced by the American College of Physicians.

Evidence Synthesis: The results are presented in systematic tables. Healthy diet and physical exercise are very important for the prevention and treatment of both entities. Metformin, sulfonylureas, dipeptidyl peptidase-4 inhibitors, and glucagon-like peptide-1 receptor agonists should be preferred for the treatment of T2D in these patients, whereas strict targets should be avoided for the fear of hypoglycemia, falls, and fractures. Insulin should be used with caution and with careful measures to avoid hypoglycemia. Thiazolidinediones and canagliflozin should be avoided, whereas other sodium-dependent glucose transporter 2 inhibitors are less well-validated options.

Insulin therapy is the preferred method for achieving glycemic control in hospitalized patients with T2D and fractures. The treatment and monitoring of osteoporosis should be continued without important amendments because of the presence of T2D.

Conclusions: Patients with coexisting T2D and osteoporosis should be managed in an optimal way according to scientific evidence.