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- Sélection, parmi sept recommandations de bonne pratique, pour la prévention des maladies cardiovasculaires via les procédures Agree II et ADAPTE.
- Identification des références bibliographiques des recommandations internationales « National Stroke Foundation, Guidelines for the management of absolute cardiovascular disease risk, 2012 » et « Canadian Diabetes Association, Clinical practice guidelines for the prevention and management of diabetes in Canada, 2013 », à intégrer dans la matrice de recherche de l'étude SPICES.

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Abstract

Introduction:

Cardiovascular diseases (CVD) are the first cause of death worldwide. CVD risk factors are known and CVD primary prevention is possible. However, current main strategies are focused on medication and medical access is not sustainable, especially in low-income countries. Changes are necessary. SPICES aim was to implement non-pharmacologic CVD primary prevention recommendations in communities. A systematic literature review seeking to implementation was conducted. The ADAPTE process and its AGREE 2 tool allowed selection of efficient prevention interventions among the best international guidelines.

Method:

Seven guidelines were analysed with the AGREE 2 tool. Guidelines with a double overall assessment equal or superior to 5 were selected. Then, recommendations concerning CVD non-pharmacological primary prevention for communities with an A or B level of evidence were extracted from two retained guidelines. References supporting recommendations were extracted and gathered in a matrix if they were of high level of evidence (systematic review, randomized controlled trial, cohort study) and had a positive outcome.

Results:

Among the seven guidelines, six were retained. 53 references were selected among 22 recommendations.

Discussion:

An exhaustive CVD primary prevention international guidelines review and the extraction of their references were accomplished for SPICES. The choice of ADAPTE was creative. ADAPTE differed from PRISMA because of its implementation focus. Information bias and selection bias were limited by consensus between SPICES project members and by selection of high level of evidence guidelines.

Résumé

Introduction :

Les maladies cardiovasculaires (MCV) sont la première cause de décès dans le monde. Leurs facteurs de risque sont connus et une prévention primaire est possible. Cependant, les principales stratégies actuelles sont axées sur les médicaments et l'accès médical n'est pas suffisant, particulièrement dans les pays à faible revenus. Des changements sont nécessaires. SPICES visait à mettre en œuvre, à l'échelle locale, des recommandations non-pharmacologiques concernant la prévention cardiovasculaire (CV) primaire. Une revue systématique de la littérature pour une mise en œuvre fut réalisée. La méthode ADAPTE et son outil AGREE 2 ont permis une sélection d'interventions de prévention efficaces parmi les meilleures recommandations de bonne pratique (RBP) internationales.

Méthode :

Sept RBP ont été analysées avec l'outil AGREE 2. Les RBP avec une évaluation générale égale ou supérieure à 5 ont été sélectionnées. Ensuite, les recommandations avec un niveau de preuve de A ou B concernant la prévention CV primaire non-pharmacologique dans les collectivités ont été extraites des 2 RBP retenues. Les références de ces recommandations ont été recueillies dans une matrice si elles appartenaient à des études à haut niveau de preuve (revue systématique de la littérature, essai contrôlé randomisé, étude de cohorte) avec un résultat positif.

Résultats :

Parmi les sept RBP, six ont été retenues. 53 références ont été sélectionnées sur 22 recommandations.

Discussion :

Une revue exhaustive de la littérature internationale sur la prévention CV primaire et une extraction de leurs références ont été accomplies à travers SPICES. Le choix de la méthode ADAPTE était originale. ADAPTE différait de la méthode PRISMA mais était plus adaptée à notre objectif de mise en œuvre. Les biais d'information et de sélection ont été limités au maximum grâce aux consensus trouvés entre les membres du projet SPICES et à l'utilisation de RBP de haut niveau de preuve.

1 Introduction

1.1 Background

Cardiovascular diseases (CVD) are the first cause of death worldwide according to the World Health Organization (WHO). In 2015, 17,7 million deaths were attributable to CVD, that is 31 % of the mortality worldwide. 7,4 million are due to coronary heart disorders and 6,7 million to strokes (1). In Europe, 45% of deaths are due to CVD (2). In France, CVD are the second cause of mortality (and the first one for women) after cancers (3).

CVD are usually caused by a combination of risk factors. CVD Risk factors (CVDRF) are identified: tobacco use, unhealthy diet, obesity, physical inactivity, harmful use of alcohol, hypertension, diabetes and hyperlipidemia (1).

Primary cardiovascular prevention targets modifiable risk factors to prevent the occurrence of CVD in healthy individuals. Some initiatives in primary prevention were developed like smoking cessation programs or healthy diet promotion campaigns. However, in high-income countries, these programs did not yield results despite a high cost. Tobacco use in France increased between 2005 and 2010, and was stabilized at 32% of smokers of the population in 2007 (4). Another example of this failure was obesity increase in France. Percentage of obese people increased from 8.5% to 14.5% between 1997 and 2009 (5). In France, in 2007, CVD cost was estimated at 17,9 billion euros and was growing from year to year (6).

Three quarters of CVD deaths occurred in low- or middle-income countries (1). Control of CVDFR was a challenge for low-income countries. More than 77% of diabetics lived in low-income countries. By 2030, Africa diabetics population will exceed 42 million people (7). Nearly 80% of smokers worldwide lived in low- and middle-income countries (8). Due to a poor primary care network in low- and middle-income countries, people were detected at CVD disease state and died younger or become disabled, often in their most productive years. These preventable deaths and handicaped people contributed to poverty of families and were an economic loss at a macro-economic level (9). Furthermore, the failure of current CVDFR prevention plans in low-income countries arose from copying the high-income countries care model (an hospital- and specialist-centric care with a clinical and biological regular follow-up) to low-income countries, which was unsustainable because of human, technical and financial resources limitations (10).

Implementation of preventive programs in all countries was necessary. Cost for intervention concerning prevention and control of CVD was estimated under 4 % of healthcare costs in low-income countries and 1-2 % in high-income countries. The cost of implementing the OMS action plan was estimated at US$ 940.26 million for the eight-year period 2013–2020 (11).

1.2 The SPICES project

1.2.1 Introduction

This work has been undertaken within the SPICES project (Scaling-up Packages of Interventions for Cardiovascular disease prevention in selected sites in Europe and Sub-Saharian Africa). This project aimed to implement innovative non-pharmacological interventions in prevention of cardiovascular risk in Europe and Sub-Saharan Africa.

SPICES is an implementation study. According to WHO, implementation is a *"scientific inquiry into implementation issues. This type of study analyses health politics, clinical practice and care programs to understand why and how some health programs work and some other do not"*. Furthermore, it elaborates innovative interventions and evaluates different means to improve them. Researchers are interested in the political, social, economic, cultural and geographical context of populations. Researchers, field performers and populations work together to ensure successful implementation (12).

SPICES was a 5 years international program financed by a European funding called "Horizon 2020". Populations at moderate cardiovascular risk and with a difficult access to healthcare were targeted.

Three high-income countries and two low-income countries took part to the project: France (University of Brest), United Kingdom (University of Brighton and Nottingham Trent), Belgium (University of Antwerp), Uganda (University of Makerere) and South Africa (University of Limpopo).

SPICES was inspired by progresses realized in the treatment of HIV/AIDS in Sub-Saharan Africa and in the care of chronic diseases defined by the Innovative Care for Chronic

Conditions (ICCC) Framework, plan of WHO. The ICCC was created by WHO in 2002 to promote the management of chronic diseases. ICCC aims were:

- To adapt the health system currently focused on acute diseases which no longer met the needs of patients suffering from chronic diseases,
- To adapt health policies,
- To build an integrated health care into the community,
- To organize sectoral policies,
- To use healthcare professionals more effectively,
- To promote a healthcare system centered on the patient and his family,
- To improve prevention (13).

In France, the study will be conducted in the Pays Centre-Ouest Bretagne (Pays COB). This territory was affected by an insufficient medical demography with 8,5 general practitioners for 10 000 inhabitants against 10,4 for the national average (14). This is a low income region and with a high CVD prevalence (15). This project has multiple stages. A first observation stage in the five countries consisted in an evaluation of the current needs. A simultaneous structured literature review of the international guidelines was conducted, including this work. The following stages will be implementation of the best interventions (maybe skills delegation, information campaign, screening, etc.) and their evaluation.

1.2.2 The ADAPTE Process

This work belonged to the guidelines review focused on CVD prevention. Guidelines were selected beforehand by the university of Brest and Antwerp. The ADAPTE Process method and the ADAPTE Tool (Figure 1) were used.

Figure 1: The Adapte Process

The ADAPTE process provides a 24-steps systematic approach to adapt guidelines produced in one setting for a use in a different cultural and organizational context. It can be used for guidelines evaluation and for guidelines development (16).

The ADAPTE tool include three phases: the first one, the Set-up phase, is an inventory before starting the proper adaptation. The aim of the second phase, the Adaptation phase (step 7 to 18) is to define the health question, to select and evaluate useful guidelines for the project. The third phase, named finalization, aims at the creation of the final document.

SPICES project focused on set-up and adaptation phases of the ADAPTE method. Steps 1 to 10 were completed before this study.

1.2.2.1 Step 7:

A research question was first established to select guidelines. The PIPOH tool was used to define the overall research question and the search strategy for relevant guidelines.

1.2.2.2 ***The PIPOH*** result for our project:

- **P**atient population: People at low to moderate risk of cardiovascular disease,
- **I**nterventions of interest: Validated lifestyle interventions (smoking cessation, healthy diet and weight loss) for primary cardiovascular prevention, methods of delivery and strategies for implementation,
- **P**rofessionals targeted by the guideline: general practitioners, practice nurses, lay people, peers,
- **O**utcomes and endpoints: prevention of CVD and cardiovascular risk factors reduction (reduced CVD risk primary and secondary),
- **H**ealthcare setting and context: Guidelines applied to primary health care level and/or community level.

Considering the PIPOH tool, the overall research question was:

- *Which lifestyle interventions related to smoking cessation, healthy diet and weight loss are proven effective in reducing cardiovascular risk (primary /secondary outcomes) in primary prevention of cardiovascular diseases on primary health care and/or community level?*

- *Which strategies for implementation of these interventions are proven to be effective (outcome measures on implementation)?*

1.2.2.3 Step 8:

A systematic review of international (Netherlands, Europe, USA, Australia) and national (each participant country) guidelines have been conducted from July to October 2017.The search was conducted on two databases, G-I-N database (Guidelines International Network) and TRIP Database (Turning Research Into Practice). A specific search for national guidelines of the SPICES consortium was made. This search was conducted in June 2017 and started by consulting SPICES consortium partners.

1.2.2.4 Step 9 to 10:

Guidelines abstracts were analyzed for eligibility based on the following inclusion/exclusion criteria.

Inclusion criteria were:

- **Population**: guidelines were included if they focused on CVD primary prevention and/or management of CVD risk factors in adults in general population,
- **Date**: search was limited to guidelines published after 01/01/2012. Guidelines published before this date but revised and updated or found up-to-date were identified. If different versions of a same guideline were found, only the most recent revision was included,
- **Setting**: guidelines that are applicable to the primary health care level and community level only were included in this review,
- **Interventions**: guidelines focusing on non-pharmacological lifestyle interventions were included,
- **Country**: suitable international guidelines from WHO, USA, Australia and Europe were included. Relevant national guidelines of each participating country within the SPICES consortium were also included in the literature review,
- **Publication language**: guidelines published in English, French or Dutch were included only.

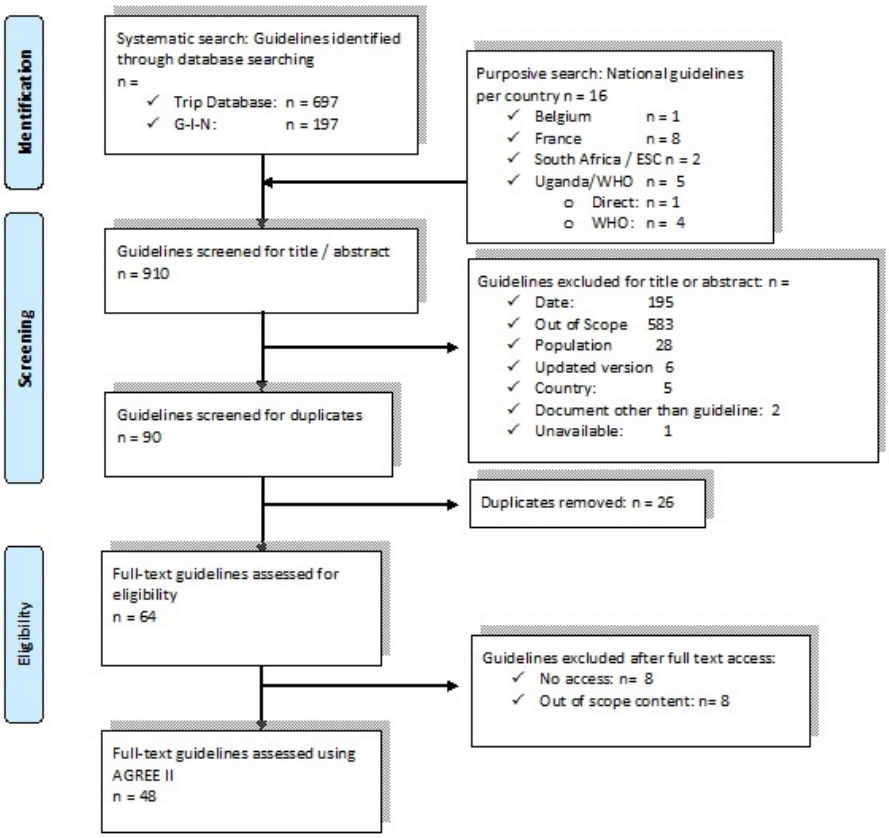
Exclusion criteria were:

- **Population**: Guidelines focusing exclusively on the following populations were excluded:
    - Specific population: geriatric or infantile only, socially deprived only,
    - Management of acute disease or destabilized chronic cardiovascular disease,
    - Diseases others than CVD,
    - Specific conditions: e.g. Type 1 Diabetes and familial hypercholesterolemia.
- **Interventions**: Exclusive focus on pharmacological or surgical interventions and on screening and cardiovascular risk assessment were excluded as considered out of scope for this project.
- **Full text availability**: no free full text availability was an exclusion criterion. Research team estimated that a clinical practice guideline should be freely available.

The selection of guidelines was double-blind realized by a member of the University of Antwerp and the University of Brest.

Figure 2 summarizes guidelines identification and selection process.

Figure 2: Guidelines identification and selection process**.**



Forty-eight guidelines were retained for the ADAPTE further step (Appendix A).

1.3 ADAPTE and AGREE 2 score

The use of AGREE 2 tool (Appraisal of Guidelines for Research & Evaluation*)* is the step 11 of the ADAPTE method. It consisted of assessment of guidelines quality and their selection for the matrix realization.

Interventions would then be extracted from the selected guidelines, to be used for the SPICES implementation study.

1.4 Research question

The research question of this study was:

- Among seven international guidelines retained by the previous ADAPTE steps and allocated to this thesis work, which guidelines addressing non-pharmacologic CVD primary prevention could be selected by the AGREE 2 tool?
- In retained guidelines of the previous step, which references underlying CVD recommendation could be included in the matrix destined to the SPICES project?

2 Method

The aim of this work was to carry on steps 11, 12 and 13 of the ADAPTE tool. Brest research group met once a month for tasks distribution and progresses and difficulties evaluation.
In the Brest SPICES team, the research group comprised two junior researchers, one senior researcher and six medical students. This part of the project occurred from November 2017 to January 2018.

2.1 Guidelines evaluation

2.1.1 Guidelines allocation

During a meeting of the Brest research group, each student chose one or two guidelines according to his focus. Remaining guidelines was secondly randomized among students following these criteria:

- The length of the guideline: if the first guideline or the next was short, the remaining ones were longer and vice-versa.

- Same guideline developers: each guideline developer used a specific structure and it was easier for the student to search for information when he was used to it.
- The number of guidelines: each student received 5-6 guidelines to score.

Seven guidelines were allocated to this study:

1. National Institute for Health and Care Excellence (NICE), Obesity (CG43), 2014 (17),
2. NICE, Behavior change: individual approaches (PH49), 2014 (18),
3. Canadian Diabetes Association, Clinical practice guidelines for the prevention and management of diabetes in Canada, 2013 (19),
4. U.S. Preventive Services Task Force, Screening for and management of obesity in adults, 2013 (20),
5. NICE, Preventing type 2 diabetes - population and community interventions (PH35), 2014 (21),
6. NICE, Obesity - working with local communities (PH42), 2012 (22),
7. National Stroke Foundation, Guidelines for the management of absolute cardiovascular disease risk, 2012 (23).

2.1.2 Agree 2 tool

AGREE 2 tool assesses guideline quality by evaluating the methodological rigor and transparency. It was developed to address the issue of variability in guideline quality.

AGREE 2 consists of 23 key items organized within 6 domains followed by two overall rating (Overall assessment*)*. Each domain captures a dimension of guideline quality:

- Domain 1. Scope and Purpose: evaluate objective, population and healthy questions,
- Domain 2. Stakeholder Involvement: concern guideline developers and the pertinence of the group selected,
- Domain 3. Rigor of Development: concern the research process,
- Domain 4. Clarity of Presentation: evaluate the language, structure and format used,
- Domain 5. Applicability: concern difficulties or facilitator elements for guideline application, improvement strategy and cost,
- Domain 6. Editorial Independence: evaluate if the views of the funding body do not influence the content of the guideline (24).

Each item is rated on a 7-point scale, 1 being the worst and 7 being the best possible quality.

Agree developers recommend a procedure to evaluate guidelines by each appraiser:

- Reading instruction contain on the AGREE notice before starting the score,
- Reading carefully guideline document in full and identify all information about the guideline development process (may be contained in separate documents),
- Scoring domains after domains,
- A final question: "would you recommend this guideline?" corresponding to a general evaluation,
- Defining an Overall Assessment (OA) (24).

Overall assessment (OA) is not the calculated average of item scores. There is no defined cut-off for good or poor quality, AGREE developers estimated that *"this decision should be made by the user and guided by the context in which AGREE II is being used"* (24).
After discussion with SPICES consortium, final inclusion was based on OA scores:

- All appraisers OA scores superior or equal to 5 (over 7): inclusion,
- All appraisers OA scores inferior to 5: exclusion,
- OA score around cut-off: exclusion (One OA score of 4 and one OA score of 5),
- Discrepant OA scores, i.e. difference of more than 1 point with at least one OA score being superior or equal to 5: discussion between appraisers and consensual decision (24).

Concerning this work, each screened guideline was evaluated independently by at least two researchers. Quality assessed with the AGREE 2 tool was realized from June to November 2017. I was the first appraiser.

2.1.3 Matrix creation

After the AGREE 2 evaluation, included guidelines were allocated to members of the SPICES's group and analyzed to describe effective interventions and their implementation for primary CVD prevention. References underlying recommendations were explored to find interventions. Matrix of interventions was created to resume data.

This analysis of guidelines is the step 13 of ADAPTE.

2.1.3.1 Allocation of included guidelines for extraction of the recommendations

Two guidelines were distributed to members of the SPICES's group. As far as possible, guidelines allocated belonged to recommendation offices on which the member had already worked on.
2 guidelines were allocated to this work:

- Canadian Diabetes Association, Clinical practice guidelines for the prevention and management of diabetes in Canada, 2013 (19),
- National Stroke Foundation, Guidelines for the management of absolute cardiovascular disease risk, 2012 (23).

2.1.3.2 Inclusion and exclusion criteria of the recommendations

Retained recommendations were:

- Non-pharmacological recommendations (diet, alcohol, smoking cessation, weight loss, hypertension care …),
- Recommendations with A or B or *Strong* level of evidence,
- Primary prevention or community care about CVD.

Excluded recommendations were:

- Recommendations focusing on secondary or tertiary CVD prevention,
- Pharmacological and surgical interventions recommendations,
- Diagnostic procedures recommendation,
- Recommendations without bibliographical references,
- Grade of recommendation less than B or *Strong*.

2.1.3.3 References selection

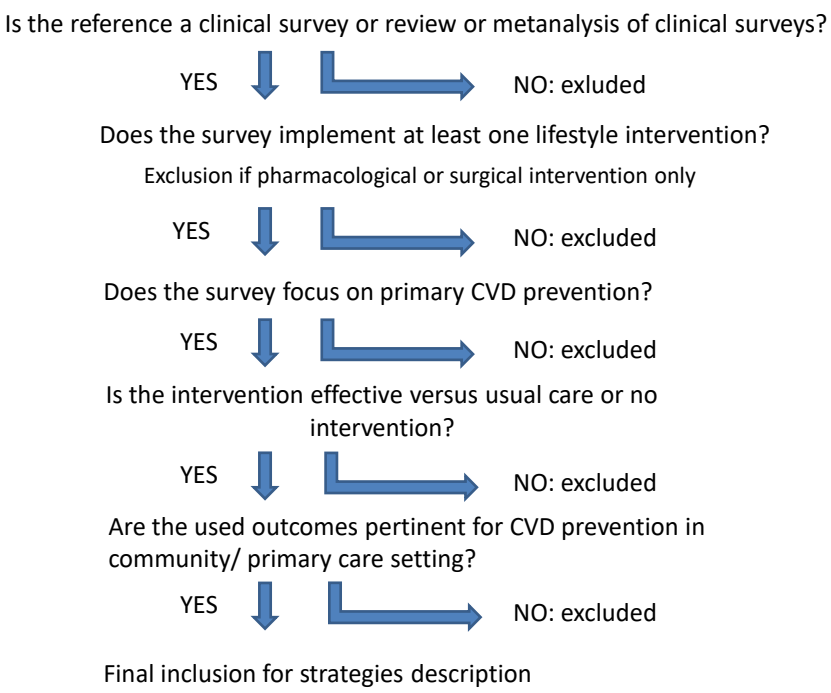
Once recommendations extracted, their references were collected. References were included after reading of their title and abstract. Duplicates were tracked and removed.

Included studies were:

- High level of evidence studies: Randomized controlled trials (RCTs), cohort interventional surveys, systematic reviews and meta-analysis of such surveys,
- Intervention about non-pharmacological CVD prevention in primary care,
- Free availability on the internet or accessible by hospital intranet.

Figure 3 shows the selection algorithm of references.

Figure n° 3: Selection criteria for references inclusion.



2.1.3.4 Matrix creation

The matrix was a spreadsheet with two entrances. Its aim was to classify recommendations extracted from guidelines and the references underlying them.

Table 1 shows the research group matrix.

Table 1: matrix of data extraction

Healthy lifestyle	Recommendation	Class/ level	References	Derived from first references	Intervention: yes/no	Survey type	Brief intervention	Inclusion/ exclusion

This thesis work stopped to the description of recommendations and extraction of references. The "derived from first references" columns were fulfilled in further steps of the SPICES project.

2.1.3.5 Removal of duplicates

Guidelines made some similar recommendations, frequently elaborated on the same references therefore, references could be found in different guidelines plus repeatedly in the same guideline. Duplicates were tracked and removed.

3 Results

3.1 Quality evaluation of guidelines

3.1.1 AGREE 2 score results

Table 2 shows OA of the first and second appraisers, global comments and final decision about guidelines (inclusion/exclusion).

The detailed item by item AGREE score of each guideline is available on appendix B.

Table 2: AGREE 2 score results

Guidelines	First appraiser evaluation	Second appraiser evaluation	Final decision
U.S. Preventive Services Task Force, Screening for and management of obesity in adults, 2013	OA score: 5	OA score: 5	OA score:67%
	Comment: good level of evidence (grade B). Rigour of development of this guideline well constructed.	Comment:	Yes –2 Yes, with modifications –0 No –0
			Inclusion
National Institute for Health and Care Excellence (NICE), Obesity (CG43), 2014	OA score: 5	OA score: 5	OA score: 67%
	Comment: No level of evidence like other guidelines of NICE. Good description of population and targets users. A lot of interesting appendix available on NICE.	Comment:	Yes –1 Yes, with modifications –1 No -0
			Inclusion
NICE, Behavior change: individual approaches (PH49), 2014	OA score: 5	OA score: 6	OA score: 75 %
	Comment: no grade of evidence. No link very clear between recommendation and evidence. Rigour of the	Comment:	Yes –1 Yes, with modifications –1 No –0

	method.		**Inclusion**
Canadian Diabetes Association, Clinical practice guidelines for the prevention and management of diabetes in Canada, 2013	OA score: 6	OA score: 5	OA score: 75%
	Comment: good guideline with interesting recommendations about diabetes but not always adapted to our study. Rigour of the method very important. Presentation clear.	Comment:	Yes -2 Yes, with modifications –0 No –0 **Inclusion**
NICE, Preventing type 2 diabetes - population and community interventions (PH35), 2014	OA score:6	OA score:4	OA score: 67%
	Comment: good guideline. Good procedure of development. Rich literature review. No grade of evidence like other guidelines of NICE.	Comment: it would be more a 4,5. This guideline is for national / regional stakeholder for health plan and political decisions: that's why recommendations are not specific. Main strength: literature review. Main limitation: recommendations are not linked to evidence nor graded. Seems like all evidence from UK studies. For SPICES: would it be helpful? in case this guideline is included we should check only for high quality studies (evidence included also case report)	Yes –1 Yes, with modifications –1 No –0 **Inclusion** **After discussion**
NICE, Obesity - working	OA score:4	OA score:5	OA score: 58%

with local communities (PH42), 2012	Comment: no grade of evidence like the other guidelines of NICE. Interest of this guideline in our study insufficient.	Comment:	Yes –0 Yes, with modifications –2 No –0 **Exclusion**
National Stroke Foundation, Guidelines for the management of absolute cardiovascular disease risk, 2012	OA score :6	OA score :7	OA score: 92%
	Comment: very good guideline. Method very interesting and well described. Presentation clear. A lot of recommendations and references useful in our study.	Comment: Very transparant, correct development process!	Yes –2 Yes, with modifications –0 No –0 **Inclusion**

3.1.2 Summary

On the 7 evaluated guidelines, 5 of them were included immediately, 1 was included after discussion and one was excluded.

3.2 Sample matrices

3.2.1 National Stroke Foundation, Guidelines for the management of absolute cardiovascular disease risk, 2012 (23)

3.2.1.1 Included/excluded recommendation

19 recommendations were listed in this guideline.

Three recommendations responded to inclusion criteria:

- Weight loss should be recommended for people who are overweight or obese (Grade B).
- All adults should be advised to participate in at least 30 minutes of moderate intensity (Grade B).
- All smokers should be advised to stop smoking (Grade A).

Sixteen recommendations were eliminated:

- 4 recommendations were diagnostic procedure recommendations.
- 10 recommendations were pharmacological intervention recommendations.
- 8 recommendations were grade C or D.

Appendix C shows included and excluded recommendation and reasons of inclusion or exclusion.

3.2.1.2 Selection of references

References of the 3 selected recommendations have been analyzed.

- The recommendation "Weight loss should be recommended for people who are overweight or obese" was based on 35 references.

12 references fulfilled inclusion criteria and were included. They were references 2, 4, 9, 10, 23, 25, 27, 28, 30, 31, 33, 34.

23 references were excluded.

Table 4 represents the justification and the number of the references excluded.

Table 4: references excluded and their justifications of the recommendation "Weight loss should be recommended for people who are overweight or obese".

Reason of the reference's exclusion	Number of the reference
Report	1
Not freely available on the internet	11, 14, 15 16, 18
New version replaces it	3, 35
Meta-analysis of observational cohort studies.	5, 6, 11, 12, 13, 14, 15, 24
Systematic review of cohort study	16
Observational cohorts	17, 18, 19, 20, 21
Secondary prevention	7, 32
Results not significant	8, 12, 22
Meta-analysis using a multivariate approach	26
Studies evaluating drugs versus non-phamacological treatments	29

- The recommendation "All adults should be advised to participate in at least 30 minutes of moderate intensity" was based on 16 references.

6 recommendations were included: references 37, 45, 46, 48, 50 and 51. 10 references were eliminated.

The table 5 represents the justification and the number of the references excluded.

Table 5: references excluded and their justifications of the recommendation "All adults should be advised to participate in at least 30 minutes of moderate intensity".

Reason of the reference's exclusion	Number of the reference
Definition of terms	36
Prospective cohort studies	38, 44
Meta-analysis of prospective cohort studies	39, 40, 41, 43
Not freely available on the internet	47
Narrative review	42, 49

- The recommendation "All smokers should be advised to stop smoking" was based on 22 references.

6 references were included: references 52, 54, 67, 68, 69, 70.

16 references were excluded.

The table 6 represents the justification and the number of the references excluded.

Table 6: references excluded and their justifications of the recommendation "All smokers should be advised to stop smoking".

Reason of the reference's exclusion	Number of the reference
Observational prospective cohort studies	53, 55, 56, 57, 58, 60
Case-control studies	59, 74
Retrospective study	61
Not available on the internet	62
Observational study	63
Pharmacological test	64, 65, 66
Secondary care	71
Population exclusion criteria	72, 73

3.2.1.3 Matrix part for *"National Stroke Foundation, Guidelines for the management of absolute cardiovascular disease risk, 2012"* (23)

Appendix D reports in a part of the matrix details for each included and excluded references of the selected recommendation with a short definition.

3.2.2 Canadian Diabetes Association, Clinical practice guidelines for the prevention and management of diabetes in Canada, 2013 (19)

3.2.2.1 Included/excluded recommendation

This guideline contained 251 recommendations.

19 recommendations met the inclusion criteria:

- Recommendation 11. The following quality improvement strategies should be used, alone or in combination, to improve glycemic control (grade A):
    - a) Promotion of self-management,
    - b) Team changes,
    - c) Disease (case) management,
    - d) Patient education,
    - e) Facilitated relay of clinical information,
    - f) Electronic patient registries,
    - g) Patient reminders,
    - h) Audit and feedback,
    - i) Clinician education,
    - j) Clinician reminders (with or without decision support).
- Recommendation 15. Telehealth technologies may be used as part of a disease management program to (grade A and B):
    - 1. Improve self-management in underserviced communities,
    - 2. Facilitate consultation with specialized teams as part of a shared-care model.
- Recommendation 16. People with diabetes should be offered timely diabetes education that is tailored to enhance self-care practices and behaviours (grade A).
- Recommendation 17. All people with diabetes who are able should be taught how to self-manage their diabetes (grade A).
- Recommendation 18. Self-Management Education (SME) that incorporates cognitive-behavioural educational interventions, such as problem solving, goal setting, and self-monitoring of health parameters, should be implemented for all individuals with diabetes (grade B).
- Recommendation 19. Interventions that increase patient participation and collaboration in healthcare decision making should be used by providers (grade B).

- Recommendation 20. For people with type 2 diabetes, SME interventions should be offered in small group and/or one-on-one settings, since both may be effective (grade A).
- Recommendation 21. In both type 1 and 2 diabetes, interventions that target families' ability to cope with stress (grade B).
- Recommendation 37. People with diabetes should accumulate a minimum of 150 minutes of moderate- to vigorous-intensity aerobic exercise each week, spread over at least 3 days of the week, with no more than 2 consecutive days without exercise (grade B for type 2 diabetes).
- Recommendation 38. People with diabetes (including elderly people) should perform resistance exercise at least twice a week and preferably 3 times per week in addition to aerobic exercise (grade B).
- Recommendation 39. People with diabetes should set specific physical activity goals, anticipate likely barriers to physical activity (e.g. weather, competing commitments), develop strategies to overcome these barriers and keep records of their physical activity (grade B).
- Recommendation 40. Structured exercise programs supervised by qualified trainers should be implemented when feasible for people with type 2 diabetes to improve glycemic control, CVD risk factors and physical fitness (grade B).
- Recommendation 42. People with diabetes should receive nutrition counselling by a registered dietitian to lower A1C levels and to reduce hospitalization rates (grade B for type 2 diabetes).
- Recommendation 43. Nutrition education is effective when delivered in either a small group or a one-on-one setting. Group education should incorporate adult education principles, such as hands-on activities, problem solving, role playing and group discussions (grade B).
- Recommendation 45. In overweight or obese people with diabetes, a nutritionally balanced, calorie-reduced diet should be followed to achieve and maintain a lower, healthier body weight (grade A).
- Recommendation 50. Dietary advice may emphasize choosing carbohydrate food sources with a low glycemic index to help optimize glycemic control (grade B).
- Recommendation 51. Alternative dietary patterns may be used in people with type 2 diabetes to improve glycemic control, (including):
    - Mediterranean-style dietary pattern (grade B)

    - Vegan or vegetarian dietary pattern (grade B)
    - Incorporation of dietary pulses (e.g. beans, peas, chick peas, lentils) (grade B)
    - Dietary Approaches to Stop Hypertension (DASH) dietary pattern (grade C).
- Recommendation 52. An intensive lifestyle intervention program combining dietary modification and increased physical activity may be used to achieve weight loss and improvements in glycemic control and cardiovascular risk factors (grade A).
- Recommendation 88. An interdisciplinary weight management program (including a nutritionally balanced, calorie-restricted diet; regular physical activity; education; and counselling) for overweight and obese people with, or at risk for, diabetes should be implemented to prevent weight gain and to achieve and maintain a lower, healthy body weight (grade A).

232 recommendations were eliminated:

- 194 recommendations were grade of evidence C or D.
- 39 recommendations were diagnostic recommendations.
- 114 recommendations were pharmacological recommendations.
- 1 recommendation concerned specialist care.
- 4 recommendations concerned follow-up organization of diabetes.
- 9 recommendations were education recommendations about non-cardiovascular prevention.
- 95 recommendations concerned population excluded.
- 7 recommendations were treatment objectives recommendation.
- 7 recommendations concerned secondary prevention.
- 10 recommendations concerned hypoglycemia prevention or treatment.
- 10 recommendations concerned diabetes ketoacidosis prevention or treatment.
- 1 recommendation concerned hyperosmolar hyperglycemic state treatment.
- 6 recommendations were surgical recommendations.
- 3 recommendations were psychological treatment or prevention.
- 2 recommendations were alternative medicine recommendations.
- 4 recommendations concerned the follow-up of renal dysfunction.
- 8 recommendations concerned retinopathy prevention or diagnostic.
- 5 recommendations concern neuropathy prevention or diagnostic.
- 5 recommendations concerned diabetes foot diagnostic, prevention or treatment.
- 4 recommendations concerned erectile dysfunction.

- 30 recommendations concerned fertility and pregnancy.

Appendix E reports on a table details for each included and excluded references of the selected recommendation with a short definition.

3.2.2.2 Selection of references

References were extracted from the 19 selected recommendations. 29 references were included, 4 were excluded because not corresponding to inclusion criteria and 9 were eliminated because corresponding to duplicate.

Recommendation 11 was based on 1 reference. The reference 1 was included.
Recommendation 15 was based on 2 references. The reference 2 and 3 were included.
Recommendation 16 was based on 3 references. The 3 references were included.
Recommendation 17 was based on 1 reference. The reference 7 was a duplicate of the recommendation 16.
Recommendation 18 was based on 4 references. The reference 8 was a duplicate of the recommendation 6 and was eliminated. The references 9, 10 and 11 met the inclusion criteria and were included.
Recommendation 19 was based on 1 reference. The reference 12 was a duplicate of the references 7 and 8 and was eliminated.
Recommendation 20 was based on 2 references. The reference 13 was included. The reference 14 was excluded because this study evaluated education of type 2 diabetes patients in both primary care and secondary care.
Recommendation 21 was based on 1 reference. The reference 15 explored a specific population and was eliminated.
Recommendation 37 was based on 3 references. The 3 references met the inclusion criteria and were included.
Recommendation 38 was based on 4 references. The 4 references were included.
Recommendation 39 was based on 2 references. The reference 23 was a systematic review of observational studies and was eliminated. The reference 24 met the inclusion criteria.
Recommendation 40 was based on 2 references. The references 25 and 26 were both duplicates and were eliminated.
Recommendation 42 was based on one single reference which was included.

Recommendation 43 was based on 2 references. The reference 28 was a duplicate of the reference 13 and was eliminated. The reference 29 was excluded because it was not available for free.

Recommendation 45 was based on 2 references. The reference 30 was a RCT and was included. The reference 31 was included.

Recommendation 50 was based on 4 references. The reference 32 fulfilled the inclusion criteria. The reference 33 was a cohort interventional study and was included. The reference 34 was a follow-up study and consequently eliminated. The reference 35 was included.

Recommendation 51 was based on 4 references which was included.

Recommendation 52 was based on a single reference. The reference 40 was eliminated because it was a duplicate of the reference 31.

The recommendation 88 was based on 2 references. The reference 41 was a duplicate of references 31 and 40 and was consequently eliminated. The reference 42 was a duplicate of the reference 30 and also excluded.

3.2.2.3 Matrix part for *« Canadian Diabetes Association, Clinical practice guidelines for the prevention and management of diabetes in Canada, 2013 »* (19)

Appendix F reports in a part of the matrix details for each included and excluded references of the selected recommendation with a short definition.

4 Discussion

4.1 Main results

7 guidelines were evaluated with the AGREE 2 tool. 6 were included. 2 were further analyzed.

3 recommendations of "National Stroke Foundation, Guidelines for the management of absolute cardiovascular disease risk, 2012" (25) and 24 references were included in the matrix. 19 recommendations of "Canadian Diabetes Association, Clinical practice guidelines for the prevention and management of diabetes in Canada, 2013" (21) were included and 29 references were included in the matrix.

4.2 Key points of the SPICES project and the method used

The SPICES project provided a comprehensive review of recommendations concerning CVD primary prevention in primary care worldwide. Our focus was original because it concerned non-pharmacological CV prevention in the community.

ADAPTE and AGREE 2 were important tools to know for future teaching and clinical practice. Practitioners' medical knowledge is based on recommendations learned during their medical studies and their continuous training in guidelines (25). However, this review highlighted the variable quality of studies on which the recommendations are based despite these guidelines were scored as being of a high level of evidence. These tools allowed to the medical student to understand the guidelines development process. Then, it enabled to assess the quality and limits of studies, to link easier recommendations to level of evidence and to facilitate their application to medical practice. These tools have a direct impact on the clinical practice and develop a critical eye on the reliability of the recommendations they use as health care professionals.

Guidelines recommendations are based on high level of evidence references but useful details for implementation in care practice are unfortunately not developed. For example, some elements like patient compliance should be taken into account in the implementation strategies despite it is not in the guidelines (26).

4.3 Originality of the method used in the SPICES project for the research of implementation strategy

Using the ADAPTE procedure to search implementation strategies for the SPICES project was new and original compared to conventional systematic review method.
According to the Cochrane society, "*a systematic review attempts to collate all empirical evidence that fits pre-specified eligibility criteria in order to answer a specific research question. It uses explicit, systematic methods that are selected with a view to minimizing bias, thus providing more reliable findings from which conclusions can be drawn and decisions made"* (27). The PRISMA method (Preferred Reporting Items of Systematic reviews and Meta-Analyses) is the current reference method. PRISMA ensure the clarity and transparency of reporting of systematic reviews (28). In the SPICES project, the PRISMA method would not have been adapted, as the aim of a meta-analysis is to get high level evidence to the

detriment of precision on the protocols put in place in each survey. These details are those relevant for SPICES.

Focusing on high level evidence guidelines was also innovative. Classically, systematic reviews strive to collect all relevant studies about a subject. In contrast, guidelines focus on implementable studies. HAS describe guidelines as *"methodically developed proposals to help the practitioner and the patient applying the most appropriate care in clinical circumstances"* (29). The aim of the Spices review was to respond to the needs of communities and to consider applicability of the studies that would be selected. We stated that guidelines would contain some implementation elements.

4.4 Limits and biases

4.4.1 Information biases

4.4.1.1 Related to the selected guidelines

Each selected guideline had specific structure and presentation. The references selection was difficult for some of them because level of evidence was not immediately linked to recommendations or to references. Furthermore, guidelines developers did not use a universal grading of evidence. 3 guidelines used the A, B, C, D grade system but 4 of them, which were developed by NICE organization, did not grade their recommendations but their references. These references were linked to research review questions and not directly to recommendations (17) (18) (21) (22). Some strategies needed to be in place. First, guidelines of same developers were assigned as much as possible to a same appraiser who developed his own expertise about structures of guidelines issued from same developers. Secondly, the references quality, linked to ungraded recommendations was evaluated and the recommendation was included if references level of evidence was high.

4.4.1.2 Related to participants of the SPICES project

Guidelines appraisers were one senior researcher, two junior researchers and six medical students. Guidelines were evaluated by an experimented researcher and a medical student. Merging the AGREE 2 scores might have been leaded by the opinions of the more experimented researchers. When a difference of opinion arose, the opinion tended to point to the argument of the experienced researcher. In order to limit this bias, each rating disagreement was discussed between the two appraisers with reassurance on taking into

account of the student's opinion. Furthermore, there were shy personalities inside the group who would not defend their opinion on the quality of guidelines. A special consideration on group animation to limit this bias was given.

Finally, most of the guidelines were English written. The variable English practice's level of the appraisers may have distorted the scoring and may have constituted a limit. In order to limit it, guidelines were scored by at least one good English speaker.

4.4.1.3 Related to the method

The use of the AGREE 2 tool was long and tedious. Also, it was becoming easier and easier to score guidelines. A difference of scoring could exist between comparable quality guidelines over the time because of experience. Important elements were easier found. In order to limit this, disagreements between appraisers were discussed when scores for the same guideline were divergent. For example, the guidelines "NICE, Preventing type 2 diabetes - population and community interventions (PH35), 2014" (21) received a score of 6 by the first appraiser and a score of 4 by the second. What emerged from the debate within the group was that the guideline was good on other items of AGREE 2 tool but its target population was different from the SPICES target users. After discussion, a consensus was reached on the score of 4,5 and the guideline has been included in our study because of its useful recommendations.

4.4.2 Selection bias

4.4.2.1 Related to the ADAPTE tool

HAS and other international learned societies recommend to use the ADAPTE tool for the creation of new guidelines taking advantage of pre-existing guidelines (30). In this study, we used this method for a different purpose. The SPICES project aimed to collect the best implement strategy in CVD primary prevention in primary care and communities. A risk has been taken not to be exhaustive and not to be up to date and to be confident on the quality of guideline reviews. Nevertheless, ADAPTE method was chosen because it guided the review to real life and implementation strategies.

Related to the method used for recommendations and reference selections a publication bias was possible. Indeed, this is the tendency to publish only studies with a positive result (31). Consequently, perhaps some studies evaluating the same interventions with inconclusive may

have been neglected by guidelines authors. The effectiveness of some intervention might be discussed. To limit this bias selection, we retained guidelines with a high level of evidence, presuming the literature review was good quality if items of AGREE 2 tool were high.
We choose the OA and a positive answer to the question "would you recommend this guideline?" as guidelines selection criteria. This score and the question answer are subjective despite the fact that AGREE 2 tool arise on 23 items rated from 1 to 7. Indeed, OA is not the calculated average of each item. This selection criterion could lead to a selection bias. The selection of some domains of AGREE 2 tool as selection criteria might have been more judicious. The domain 3 "Rigour of development" of the AGREE 2 tool could have been chosen as the guideline selection criterion. This could have been more representative of the guideline quality. For example, in this study, the guideline "NICE, Obesity - working with local communities (PH42), 2012" (22) had an OA of 58% and a score at the domain 3 of 72%. Maybe this study would likely have been included. The domain 5 "applicability" is also important in an implementation study. This domain is described in the AGREE 2 manual "*like pertaining to the likely barriers and facilitators to implementation, strategies to improve uptake, and resource implications of applying the guideline*". The study of W. Hoffman-Eβer (32) showed that "*Domains 3 and 5 have the strongest influence on the results of the 2 overall assessments, while the other domains have a varying influence".* Another important and widely underestimated item is the item 5 of the domain 2 considering the patients' views and preferences. Indeed, 4 guidelines of this study had a score inferior or equal to 3 whereas the patient is fully integrated in the implementation science (33).

Since its creation, AGREE 2 is more and more used by guidelines appraisers, and especially in the cardiovascular risk assessment (34) (35). However, AGREE 2 only evaluate guidelines and other quality appraisal tools needed to be invented to evaluate the quality of studies like systematic reviews. This is the case of the "Assessment of Multiple SysTemAtic Reviews" (AMSTAR) which was developed for the quality evaluation of randomized and non-randomized controlled trial systematic reviews (36). For example, in 2017, a systematic review about cardiovascular risk assessment in the primary prevention using the AMSTAR tool have been conducted and concluded there was no high level of evidence that using the global CV risk assessment reduce the CVD mortality or morbidity (37). However, in contrast to AGREE 2, the AMSTAR tool does not use implementation criteria in its scoring items and would not have been useful to our study if it has been used.

5 Conclusion

SPICES project is an implementation study which aim is to improve CVD primary prevention in primary care. The goal of this work was to select the most appropriate recommendations and their references in CVD prevention from high level of evidence guidelines.

Among seven allocated guidelines, two of them were studied for extraction of recommendations and their references:

- National Stroke Foundation, Guidelines for the management of absolute cardiovascular disease risk, 2012 (25),
- Canadian Diabetes Association, Clinical practice guidelines for the prevention and management of diabetes in Canada, 2013 (21).

In these two guidelines, 53 references have been selected from 22 recommendations.
The next step of the project will be the end of the fulfilling of the matrix and the implementation of the selected recommendations in selected population.

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7 Appendix

7.1 Appendix A: Selected guidelines to be scored with AGREE 2

Guidelines	Year	Organization	Country
1. Clinical practice guidelines for the management of overweight and obesity in adults, adolescents and children in Australia.	2014	National Health and Medical Research Council	Australia
2. Guidelines for the management of absolute CVD risk	2012	National Stroke Foundation	Australia
3. Globaal cardiovasculair risicobeheer aanbeveling voor goede medische praktijkvoering	2007		Belgium
4. Clinical practice guidelines for the prevention and management of diabetes in Canada	2013	Canadian Diabetes Association	Canada
5. Recommendations for prevention of weight gain and use of behavioral and pharmacologic interventions to manage overweight and obesity in adults in primary care	2015	Canadian Task Force	Canada
6. European Guidelines on cardiovascular disease prevention in clinical practice	2016	ESC	Europe
7. Arrêt de la consommation de tabac : du dépistage individuel au maintien de l'abstinence en premier recours	2017	HAS	France
8. Maintaining a healthy weight and preventing excess weight gain	2015	NICE	UK
9. Prevention of cardiovascular disease (PH25)	2010 updated 2015	NICE	UK
10. Behavior change: individual approaches (PH49)	2014	NICE	UK
11. Obesity (CG43)	2014	NICE	UK
12. Risk estimation and the prevention of cardiovascular disease 13.	2017	SIGN	UK
14. Preventing type 2 diabetes - population and community interventions (PH35)	2011 updated 2014	NICE	UK
15. Tobacco harm reduction (PH45)	2013	NICE	UK
16. Lipid modification: cardiovascular risk assessment and the modification of blood lipids for the primary and secondary prevention of cardiovascular disease. CG181	2014	NICE	UK
17. Physical activity and the environment (PH8)	2008 updated 2014	NICE	UK
18. Physical activity: brief advice for adults in primary care (PH44)	2013	NICE	UK
19. Screening for and management of obesity in adults	2012	U.S. preventive services task force	USA
20. Clinical practice guideline for screening and management of overweight and obesity.	2015	VA/DoD	USA
21. Behavioral counseling to promote a healthful diet and physical activity for cardiovascular disease prevention in adults with cardiovascular risk factors	2014	U.S. Preventive Services Task Force	USA
22. Team-based care to improve blood pressure control: recommendation of the Community Preventive Services Task Force.	2014	Community Preventive Services Task Force	USA

23. Hypertension evidence-based nutrition practice guideline.	2016	Academy of Nutrition and Dietetics	USA
24. Guideline on lifestyle management to reduce cardiovascular risk	2014	AHA/ACC	USA
25. Guideline for the management of overweight and obesity in adults	2014	AHA/ACC/TOS	USA
26. Clinical practice guideline for the management of dyslipideamia	2014	VADoD	USA
27. Clinical practice guideline for the diagnosis and management hypertension	2014	VADoD	USA
28. Prevention and Control of Non communicable Diseases: Guidelines for primary health care in low-resource settings	2012	WHO	WHO
29. Guidelines for the Management of Dyslipidemia	2016	Canadian Cardiovascular Society	Canada
30. Cardiovascular Disease - Primary Prevention	2014	Clinical Practice Guidelines and Protocols in British Columbia	Canada
31. Hypertension Diagnosis and management	2015	Clinical Practice Guidelines and Protocols in British Columbia	Canada
32. Prevention and management of cardiovascular disease risk in primary care	2015	Toward Optimized Practice (TOP)	Canada Alberta
33. Guidelines for the Management of Dyslipidaemias	2016	ESC/EAS	Europe
34. Guidelines on diabetes, pre-diabetes	2013	ESC	Europe
35. Guidelines for the management of arterial hypertension	2013	ESH/ ESC	Europe
36. Dépistage du tabagisme et prévention des maladies liées au tabac	2016	HAS	France
37. Principales dyslipidémies : stratégies de prise en charge	2017	HAS	France
38. Prise en charge de l'hypertension artérielle de l'adulte	2016	HAS	France
39. Cardiovasculair risicomanagement (M84)	2012		Netherlands
40. Guidelines for Management of Common Conditions	2012	Ministry of health Uganda	Uganda
41. Hypertension in adults: diagnosis and management CG 127	2015	NICE	UK
42. Obesity - working with local communities (PH42)	2012	NICE	UK
43. Preventing type 2 diabetes - risk identification and interventions for individuals at high risk (PH38)	2012	NICE	UK
44. Overweight and obese adults - lifestyle weight management (PH 53)	2014	NICE	UK
45. Guideline Summary: Screening and management of lipids.	2014	University of Michigan Health System	USA
46. Guideline Summary: Obesity prevention and management.	2014	University of Michigan Health System	USA
47. Tobacco treatment.	2012	University of Michigan Health System	USA
48. Behavioral and pharmacotherapy interventions for tobacco smoking cessation in adults, including pregnant women	2016	U.S. Preventive Services Task Force	USA

49. Combined diet and physical activity promotion programs	2015	Community Preventive Services Task Force	USA

7.2 Appendix B: Detailed AGREE 2 scores

Screening for and management of obesity in adults: U.S. Preventive Services Task Force recommendation statement			
AGREE items	**Appraiser 1**	**Appraiser 2**	**Calculates SCORE**
Domain 1. Scope and Purpose			**53%**
1. Overall Objective(s)	**Score: 6** To update the 2003 U.S. Preventive Services Task Force (USPSTF) recommendation statement on screening for obesity and overweight in adults. To review new evidence on the benefits and harms of screening and primary care–feasible or referable nonsurgical weight-loss interventions	**Score: 4**	
2. The health question(s)	**Score: 6** USPSTF recommends screening all adults for obesity. Clinicians should offer or refer patients with a body mass index (BMI) of 30 kg/m^2 or higher to intensive, multicomponent behavioral interventions.	**Score: 3** Not found	
3. The population	**Score: 3** Adults aged 18 years or older	**Score: 3**	
Domain 2. Stakeholder Involvement			**36%**
4. all relevant professional groups	**Score: 2** In appendix	**Score: 3**	
5. The views and preferences of the target population	**Score: 2** Not found	**Score: 2**	
6. The target users	**Score: 6** Group of health experts	**Score: 4** Advanced Practice Nurses Allied Health Personnel Dietitians Nurses Physician Assistants Physicians Psychologists/Non-physician Behavioral Health Clinicians	
Domain 3. Rigour of Development			**68%**
7. Systematic methods were used to search for evidence.	**Score: 7** Literature reviews of weight-loss intervention published since 2003	**Score: 6** Key Question 1: No trials could be identified comparing screening with not screening for adult obesity. Key Question 2: 32 articles (15 trials) Key Question 3: 98 articles (58 trials) Key Question 4: 60 articles (38 trials)	

8. The criteria for selecting the evidence	**Score: 6** Adults aged 18 years and older. Overweight is defined as a BMI of 25 to 29.9 kg/m^2, and obesity is defined as a BMI of 30 kg/m^2 or higher. USPSTF reviewed the current state of the evidence and identified new evidence that addresses previously identified gaps. The USPSTF reviewed new evidence on the benefits and harms of screening and primary care–feasible or referable weight-loss interventions. The focus of this update was on nonsurgical interventions. In primary care.	**Score: 5**	
9. The strengths and limitations of the body of evidence	**Score: 6**	**Score: 6**	
10. The methods for formulating the recommendations	**Score: 7**	**Score:5**	
11. The health benefits, side effects, and risks	**Score: 6** Benefits and risk of obesity well described	**Score: 6**	
12. Explicit link between the recommendations and the supporting evidence.	**Score:6** References in tables linked to recommendations	**Score: 6**	
13. Externally reviewed by experts prior to publication	**Score: 2**	**Score: 5**	
14. procedure for updating	**Score: 1** This is an update	**Score: 2**	
Domain 4. Clarity of Presentation			**72%**
15. The recommendations are specific and unambiguous	**Score: 6** Screening all adults for obesity. Grade B	**Score: 5** Screening for obesity. Referral to or offering patients with a body mass index (BMI) of 30 kg/m2 or higher intensive multicomponent behavioral interventions	
16. Options for management of the condition or health issue	**Score: 5**	**Score: 6**	
17. Key recommendations	**Score: 6** Figure available	**Score: 4**	
Domain 5. Applicability			**65%**
18. facilitators and barriers	**Score: 5**	**Score: 6**	
19. advice and/or tools	**Score: 6**	**Score: 6**	
20. Potential resource implications of applying	**Score: 5**	**Score: 2**	
21. The guideline presents monitoring and/or auditing criteria	**Score: 3**	**Score: 6**	
Domain 6. Editorial Independence			**79%**
22. Views of the funding body have not influenced the content	**Score: 7**	**Score: 5**	
23. Competing interests	**Score: 6** Recommendations made by the USPSTF are independent of the U.S. government. The USPSTF is an independent, voluntary body. The U.S. Congress mandates that the Agency for Healthcare Research and Quality support the operations of the USPSTF.	**Score: 5**	

Obesity prevention (CG43)			
AGREE items	**Appraiser 1**	**Appraiser 2**	**Calculates SCORE**
	Domain 1. Scope and Purpose		**75%**
1. Overall Objective(s)	**Score: 7** This guideline covers preventing children, young people and adults becoming overweight or obese. It outlines how the NHS, local authorities, early years' settings, schools and workplaces can increase physical activity levels and make dietary improvements among their target populations.	**Score: 5**	
2. The health question(s)	**Score: 7** This is the first national guidance on the prevention of overweight and obesity in adults and children in England and Wales. The guidance aims to: -stem the rising prevalence of obesity and diseases associated with it. -increase the effectiveness of interventions to prevent overweight and obesity. -improve the care provided to adults and children at risk of overweight and obesity.	**Score: 4**	
3. The population	**Score: 4** This guidance covers adults and children aged 2 years or older, either a healthy weight, overweight or obese. This includes adults and children with established comorbidities, and those with or without risk factors for other medical conditions. The following special groups are considered, where there is good evidence of effectiveness of interventions targeted at these groups: black and minority ethnic groups, lower socioeconomic groups vulnerable groups, including older people and women of child-bearing age **Group excluded:** Children aged less than 2years and the medical management of related medical conditions. However, links will be made to other appropriate NICE guidance, such as that for type 2 diabetes and eating disorders	**Score: 6**	
	Domain 2. Stakeholder Involvement		**75%**
4. all relevant professional groups	**Score: 4** See appendix A and B	**Score: 5**	
5. The views and preferences of the target population	**Score: 7** Advice, treatment and care should take into account people's needs and preferences. People should have the opportunity to make informed decisions about their care and treatment, in partnership with their health professionals.	**Score: 5**	
6. The target users	**Score: 7** Commissioners and providers Employers Local authorities Primary care trusts Healthcare professionals Head teachers and chairs of governors Children, young people and adults, and their families and careers	**Score: 5**	

Domain 3. Rigour of Development			**71%**
7. Systematic methods were used to search for evidence.	**Score: 3** See full guidelines section 2 methods	**Score: 6**	
8. The criteria for selecting the evidence	**Score: 2** Not clearly define	**Score: 6**	
9. The strengths and limitations of the body of evidence	**Score: 3** People choose whether or not to change their lifestyle or agree to treatment. Assessing their readiness to make changes affects decisions on when or how to offer any intervention. Barriers to lifestyle change should be explored. Possible barriers include: lack of knowledge about buying and cooking food, and how diet and exercise affect health the cost and availability of healthy foods and opportunities for exercise safety concerns, for example about cycling lack of time personal tastes the views of family and community members low levels of fitness, or disabilities low self-esteem and lack of assertiveness. Advice needs to be tailored for different groups. This is particularly important for people from black and minority ethnic groups, vulnerable groups (such as those on low incomes) and people at life stages with increased risk for weight gain (such as during and after pregnancy, at the menopause or when stopping smoking).	**Score: 6**	
10. The methods for formulating the recommendations	**Score: 5**	**Score:6**	
11. The health benefits, side effects, and risks	**Score: 6**	**Score: 6**	
12. Explicit link between the recommendations and the supporting evidence.	**Score:4** Not clear	**Score: 6**	
13. Externally reviewed by experts prior to publication	**Score: 6** In appendix	**Score: 6**	
14. procedure for updating	**Score: 7** NICE clinical guidelines are updated as needed so that recommendations take into account important new information. We check for new evidence 2 and 4 years after publication, to decide whether all or part of the guideline should be updated. If important new evidence is published at other times, we may decide to do a more rapid update of some recommendations. Sections 1.2 and 1.1.7 were updated in 2014 and section 1.1.1 was updated in 2015.	**Score: 6**	
Domain 4. Clarity of Presentation			**81%**
15. The recommendations are specific and unambiguous	**Score: 6** Presentation of recommendation according targets users	**Score: 6**	
16. Options for management of the condition or health issue	**Score: 5**	**Score: 6**	
17. Key recommendations	**Score: 6**	**Score: 6**	
Domain 5. Applicability			**75%**
18. facilitators and barriers	**Score: 2**	**Score: 6**	

	Not found		
19. advice and/or tools	**Score: 6**	**Score: 6**	
20. Potential resource implications of applying	**Score: 6**	**Score: 6**	
21. The guideline presents monitoring and/or auditing criteria	**Score: 6**	**Score: 6**	
Domain 6. Editorial Independence			**83%**
22. Views of the funding body have not influenced the content	**Score: 6**	**Score: 6**	
23. Competing interests	**Score: 6**	**Score: 6**	

Behaviour change: individual approaches (PH49)			
AGREE items	**Appraiser 1**	**Appraiser 2**	**Calculates SCORE**
Domain 1. Scope and Purpose			**67%**
1.Overall Objective(s)	**Score: 6** See the chapter "What is this guidance about?"	**Score: 5**	
2. The health question(s)	**Score: 6** The key questions were established as part of the scope. They formed the starting point for the reviews of evidence and were used by the PDG to help develop the recommendations. The overarching questions were: 1. Which interventions are an effective and cost effective way of changing someone's behaviour and then helping them to sustain that change? 2. Which specific behavior change techniques (and combinations of behaviour change techniques) are effective and cost effective at helping individuals change and then sustain the new behaviour in the long term (for at least 6 months following the intervention)? 3. Which behaviour change techniques are only effective for specific behaviours, such as helping people to quit alcohol or smoking? Which techniques can be used to tackle a range of behaviours? 4. What characteristics and competencies are needed to deliver behaviour change interventions and techniques effectively? 5. How do the effects of individual interventions/behaviour change techniques vary across different population groups? 6. Which theories explain when, why and how behaviour change is maintained?	**Score: 6**	
3. The population	**Score: 2**	**Score: 5**	
Domain 2. Stakeholder Involvement			**58%**
4. all relevant professional groups	**Score: 6** See the chapter "member of the Programm Development Group (PDG) and the NICE project	**Score: 6**	

	team".		
5. The views and preferences of the target population	**Score: 1**	**Score: 5** Community member	
6. The target users	**Score: 6** Commissioners, managers, training and education organisations, service providers and practitioners with public health as part of their remit working within local authorities, the NHS, and the wider public, private, voluntary and community sectors. The guidance may also be of interest to policy makers, researchers, individuals, groups or organisations wishing to work in partnership with health and social care and other service providers. In addition, it may be of interest to people who want to change their behaviour (for example, to stop smoking), their families and other members of the public.	**Score: 3**	
Domain 3. Rigour of Development			**74%**
7. Systematic methods were used to search for evidence.	**Score: 6** 1. Draft scope released for consultation 2. Stakeholder meeting about the draft scope 3. Stakeholder comments used to revise the scope 4. Final scope and responses to comments published on website 5. Evidence reviews and economic reports undertaken and submitted to PDG 6. PDG produces draft recommendations 7. Draft guidance (and evidence) released for consultation 8. PDG amends recommendations 9. Final guidance published on website 10. Responses to comments published on website	**Score: 6**	
8. The criteria for selecting the evidence	**Score: 6** Studies were included in the effectiveness reviews if they: • covered individual-level interventions aimed at behaviour change in relation to at least 1 of the following: alcohol, diet, physical activity, sexual behaviour and smoking • were published by NICE (review 1) • were randomised controlled trials or systematic reviews published from 2003 onwards in English (review 2). Studies were excluded from both reviews if they focused on: • people younger than 16 years • community-level interventions or population-level interventions • national policy, fiscal and legislative measures. Studies were included in review 3 if they described the skills or training needed to deliver behaviour change interventions in relation to at least 1 of the following: alcohol, diet, physical activity, sexual behaviour or smoking. Studies were excluded if they focused on: • community- or population-level interventions • clinical or pharmacological methods with no public health or health promotion	**Score: 6**	

	• elementpsychiatric interventions delivered as part of the therapeutic process for people with a mental health problem.		
9. The strengths and limitations of the body of evidence	**Score: 6**	**Score: 6**	
10. The methods for formulating the recommendations	**Score: 6** See the chapter "how the PDG formulated the recommendations".	**Score: 6**	
11. The health benefits, side effects, and risks	**Score: 5** See the chapter "considerations".	**Score: 5**	
12. Explicit link between the recommendations and the supporting evidence.	**Score: 5** Not clear.	**Score: 6**	
13. Externally reviewed by experts prior to publication	**Score: 3**	**Score: 6**	
14. procedure for updating	**Score: 6** This guidance will be reviewed 3 years after publication to determine whether all or part of it should be updated. Information on the progress of any update will be posted at the NICE website.	**Score: 6**	
Domain 4. Clarity of Presentation			**75%**
15. The recommendations are specific and unambiguous	**Score: 6** No grade of evidence.	**Score: 5** No grades; practical but clear and useful.	
16. Options for management of the condition or health issue	**Score: 6**	**Score: 5** Less relevant point - but recommendations are clear, no real choices but steps.	
17. Key recommendations	**Score: 6**	**Score: 5**	
Domain 5. Applicability			**71%**
18. facilitators and barriers	**Score: 6**	**Score: 6**	
19. advice and/or tools	**Score: 5**	**Score: 6** Via links in the guideline.	
20. Potential resource implications of applying	**Score: 5**	**Score: 6** Seperate recommendations.	
21. The guideline presents monitoring and/or auditing criteria	**Score: 3**	**Score: 5**	
Domain 6. Editorial Independence			**42%**
22. Views of the funding body have not influenced the content	**Score: 1** Not found	**Score: 6**	
23. Competing interests	**Score: 1** Not found	**Score: 6**	

Canadian Diabetes Association 2013 clinical practice guidelines for the prevention and management of diabetes in Canada : Introduction

AGREE items	Appraiser 1	Appraiser 2	Calculates SCORE
Domain 1. Scope and Purpose			**69%**
1.Overall Objective(s)	**Score: 7** Every 5 years, since 1992, the Clinical&Scientific Section (C&SS) of the Canadian Diabetes Association has published comprehensive, evidence-based recommendations for healthcare professionals to consider in the prevention and management of diabetes in Canada.	**Score: 5** yes- see introduction	
2. The health question(s)	**Score: 6**	**Score: 5**	

3. The population	**Score: 4** Not clearly define, we just know it concern diabetes population	**Score: 4**	
Domain 2. Stakeholder Involvement			**69%**
4. all relevant professional groups	**Score: 6** 120 volunteers, including health professionals from family medicine, endocrinology, internal medicine, infectious disease, neurology, nephrology, cardiology, urology, psychology, obstetrics, ophthalmology, pediatrics, nursing, dietetics, pharmacy, exercise physiology and others, as well as people with diabetes, participated in the guideline development process.	**Score: 6**	
5. The views and preferences of the target population	**Score: 3** Not found	**Score: 4**	
6. The target users	**Score: 7** Primary care physicians and other healthcare professionals who care for people with diabetes or those at risk of diabetes	**Score: 5**	
Domain 3. Rigour of Development			**83%**
7. Systematic methods were used to search for evidence.	**Score: 7** See the chapter methods	**Score: 7**	
8. The criteria for selecting the evidence	**Score: 7** See the table 1 of the chapter methods	**Score: 6**	
9. The strengths and limitations of the body of evidence	**Score: 3**	**Score: 6**	
10. The methods for formulating the recommendations	**Score: 6**	**Score:6**	
11. The health benefits, side effects, and risks	**Score: 5** Each recommendation are linked to a references	**Score: 6**	
12. Explicit link between the recommendations and the supporting evidence.	**Score:6** See the chapter methods	**Score: 7**	
13. Externally reviewed by experts prior to publication	**Score: 7** See the chapter "External Peer Review and Independent Methodological Review" in methods	**Score: 6**	
14. procedure for updating	**Score: 7** A process to update the full guidelines will commence within 5 years and will be published in 2018. Updates to individual chapters may be published sooner in the event of significant changes in evidence supporting the recommendations. The Executive and Steering Committees of the 2013 revision will continue to remain intact to deliberate any potential updates to individual chapters until such time as the Executive and Steering Committees for the 2018 revision have been created.	**Score: 4**	
Domain 4. Clarity of Presentation			**81%**
15. The recommendations	**Score: 7**	**Score: 6**	

are specific and unambiguous	Well described for each recommendation		
16. Options for management of the condition or health issue	**Score: 5**	**Score: 6**	
17. Key recommendations	**Score: 5**	**Score: 6**	
Domain 5. Applicability			**60%**
18. facilitators and barriers	**Score: 4**	**Score: 4**	
19. advice and/or tools	**Score: 4**	**Score: 4**	
20. Potential resource implications of applying	**Score: 6**	**Score: 6**	
21. The guideline presents monitoring and/or auditing criteria	**Score: 4**	**Score: 5**	
Domain 6. Editorial Independence			**83%**
22. Views of the funding body have not influenced the content	**Score: 7**	**Score: 6**	
23. Competing interests	**Score: 5** See the chapter "Disclosure of Duality of Interest" in methods	**Score: 6**	

Preventing type 2 diabetes - population and community interventions (PH35)

AGREE items	Appraiser 1	Appraiser 2	Calculates SCORE
Domain 1. Scope and Purpose			**86%**
2. Overall Objective(s)	**Score:7** This guideline covers preventing type 2 diabetes in adult populations and communities who are at high risk. It aims to promote a healthy diet and physical activity at community and population level, and recommends how to tailor services for people in ethnic communities and other groups who are particularly at risk of type 2 diabetes.	**Score: 6**	
2. The health question(s)	**Score: 7**	**Score: 7** Key questions available. Appendix B	
3. The population	**Score: 6** The referral was divided into two separate pieces of guidance. The first (this guidance) originally set out to address the prevention of 'pre-diabetes' among adults aged 18–74 in communities at high risk of developing type 2 diabetes. The second set out to focus on preventing the progression from 'pre-diabetes' to type 2 diabetes.	**Score: 4** People with risk factors for DM2, but since the guideline is more for national plan is a bit unclear	
Domain 2. Stakeholder Involvement			**67%**
4. all relevant professional groups	**Score: 7** Directors and commissioners GPs, practice nurses, dietitians and public health nutritionists and other health professionals Practitioners involved in physical activity interventions and community engagement Members of the public	**Score: 5** Missing paramedical	
5. The views and preferences of the target population	**Score: 2**	**Score: 3**	
6. The target users	**Score: 7**	**Score: 6**	
Domain 3. Rigour of Development			**64%**
7. Systematic methods were used to search for evidence.	**Score: 7** In appendix B	**Score: 6**	

8. The criteria for selecting the evidence	**Score: 6** In appendix B	**Score: 6**	
9. The strengths and limitations of the body of evidence	**Score: 1** No evidence tables No grade of evidence	**Score: 4** Quality of studies is evaluated during the review of evidence but no grade of evidence linked to recommendations	
10. The methods for formulating the recommendations	**Score: 7** In appendix	**Score: 5**	
11. The health benefits, side effects, and risks	**Score: 3**	**Score: 3** Costs are considered	
12. Explicit link between the recommendations and the supporting evidence.	**Score:6**	**Score: 3** A lot of recommendations don't have a direct reference	
13. Externally reviewed by experts prior to publication	**Score: 5**	**Score: 4**	
14. procedure for updating	**Score: 6** Last one on January 2018	**Score: 5**	
Domain 4. Clarity of Presentation			**67%**
15. The recommendations are specific and unambiguous	**Score: 7**	**Score: 4** Because they are national programmes they are not specific (but hard to do better)	
16. Options for management of the condition or health issue	**Score: 5**	**Score: 4**	
17. Key recommendations	**Score: 5** Recommendations descripted one by one grouped together in section, not in a summary box	**Score: 5**	
Domain 5. Applicability			**50%**
18. facilitators and barriers	**Score: 4**	**Score: 3**	
19. advice and/or tools	**Score: 5**	**Score: 4**	
20. Potential resource implications of applying	**Score: 5**	**Score: 6** Specific paper: costing statement	
21. The guideline presents monitoring and/or auditing criteria	**Score: 4**	**Score: 1**	
Domain 6. Editorial Independence			**8%**
22. Views of the funding body have not influenced the content	**Score: 1** Not clear	**Score: 3** Found by NHS?	
23. Competing interests	**Score: 1** Not found	**Score: 1**	

Obesity - working with local communities (PH42)			
AGREE items	**Appraiser 1**	**Appraiser 2**	**Calculates SCORE**
Domain 1. Scope and Purpose			**72%**
1. Overall Objective(s)	**Score: 6** This guideline covers how local communities, with support from local organizations and networks, can help prevent people from becoming overweight or obese or help them lose weight. It aims to support sustainable and community-wide action to achieve this.	**Score: 5**	
2. The health question(s)	**Score: 7**	**Score: 6** The key questions were established as part of the scope. They formed the starting point for consideration of the reviews of evidence and were used by the	

		PDG to help develop the recommendations. The key questions were: - What are the essential elements of a local, community-wide approach to preventing obesity that is sustainable, effective and cost effective? - What barriers and facilitators may influence the delivery and effectiveness of a local, community-wide approach (including for specific groups)? - Who are the key leaders, actors and partners and how do they work with each other? - What factors need to be considered to ensure local, community-wide approaches are robust and sustainable? - What does effective monitoring and evaluation look like? - Can the cost effectiveness of local, community-wide obesity interventions be established and, if so, what is the best method to use?	
3. The population	**Score: 3** Not clearly defined. We only know that it is address to overweight and obese adults and children.	**Score: 5**	
Domain 2. Stakeholder Involvement			**75%**
4. all relevant professional groups	**Score: 6** Appendix A	**Score: 5**	
5. The views and preferences of the target population	**Score: 4**	**Score: 6**	
6. The target users	**Score: 6** Policy makers, commissioners, managers and practitioners in local authorities, the NHS and the wider public, private, voluntary and community sectors. Academic organizations involved in community-wide interventions to prevent and manage obesity. Members of the public	**Score: 6**	
Domain 3. Rigour of Development			**72%**
7. Systematic methods were used to search for evidence.	**Score: 6** See appendix B	**Score: 6** A number of databases were searched in July 2010 for interventions published in English from 1990 onwards. See the review for details. General health and topic-specific websites and other sources of grey literature were also searched	
8. The criteria for selecting the evidence	**Score: 5** Studies were included in the effectiveness review	**Score: 6**	

	if they: • demonstrated core features of a whole-system approach (as identified in review 1) to preventing obesity or smoking • covered whole populations or communities and reported on outcome measures or other indicators for an intervention • used comparative study designs • were published from 1990 onwards in English. Studies were excluded if they: • did not report on the outcomes listed • only presented a single component of an intervention or strategy • did not focus on obesity prevention, improving physical activity or diet, or smoking prevention.		
9. The strengths and limitations of the body of evidence	**Score: 4** No grade	**Score: 6**	
10. The methods for formulating the recommendations	**Score: 5** See appendix B	**Score:6** 1. Draft scope released for consultation 2. Stakeholder meeting about the draft scope 3. Stakeholder comments used to revise the scope 4. Final scope and responses to comments published on website 5. Evidence reviews and economic modelling undertaken and submitted to PDG 6. PDG produces draft recommendations 7. Draft guidance (and evidence) released for consultation 8. PDG amends recommendations 9. Final guidance published on website 10. Responses to comments published on website	
11. The health benefits, side effects, and risks	**Score: 6**	**Score: 5**	
12. Explicit link between the recommendations and the supporting evidence.	**Score:6** Appendix C	**Score: 6**	
13. Externally reviewed by experts prior to publication	**Score: 1**	**Score: 6**	
14. procedure for updating	**Score: 5**	**Score: 6** This guidance will be reviewed 3 years after publication to determine whether all or part of it should be updated. Information on the progress of any update will be posted on the NICE website.	
Domain 4. Clarity of Presentation			**78%**
15. The recommendations	**Score: 7**	**Score: 6**	

are specific and unambiguous			
16. Options for management of the condition or health issue	**Score: 7**	**Score: 5**	
17. Key recommendations	**Score: 5**	**Score: 4**	
Domain 5. Applicability			**73%**
18. facilitators and barriers	**Score: 3** One review was undertaken to define a 'whole-system approach' (review 1) and one review of qualitative data was undertaken to consider the barriers and facilitators to such an approach (review 3).	**Score: 6**	
19. advice and/or tools	**Score: 6**	**Score: 6**	
20. Potential resource implications of applying	**Score: 6**	**Score: 6**	
21. The guideline presents monitoring and/or auditing criteria	**Score: 5**	**Score: 5**	
Domain 6. Editorial Independence			**42%**
22. Views of the funding body have not influenced the content	**Score: 1** Not found	**Score: 6**	
23. Competing interests	**Score: 1** Not found	**Score: 6**	

Guidelines for the management of absolute cardiovascular disease risk			
AGREE items	**Appraiser 1**	**Appraiser 2**	**Calculates SCORE**
Domain 1. Scope and Purpose			**92%**
1.Overall Objective(s)	**Score: 7** CVD remains the leading cause of mortality in Australia. These guidelines have been developed to consolidate a number of evidence-based guidelines for conditions with similar risk factors and management approaches, and provide clear guidance to prevent first-ever CVD events.	**Score: 7**	
2. The health question(s)	**Score: 7** **See appendix 2**	**Score: 7**	
3. The population	**Score: 5** Australian adults aged 45 years and over (35 years for A&TSI peoples) who have no previous history of CVD.	**Score: 6**	
Domain 2. Stakeholder Involvement			**86%**
4. all relevant professional groups	**Score: 7** See appendix 1	**Score: 7**	
5. The views and preferences of the target population	**Score: 5**	**Score: 6** The Corresponding Group had 22 members with wide representation across all of the previously identified groups and also broad representation across the lifestyle issues such as smoking, physical activity, nutrition, depression and alcohol. + public consultation (appendix 2)	
6. The target users	**Score: 6** General practitioners, Aboriginal health workers, other primary care health professionals and physicians.	**Score: 6**	
Domain 3. Rigour of Development			**84%**
7. Systematic methods were used to search for evidence.	**Score: 6** See appendix 2	**Score: 6**	

8. The criteria for selecting the evidence	**Score: 6** See appendix 2	**Score: 7**	
9. The strengths and limitations of the body of evidence	**Score: 6**	**Score: 6** Appendix 2 (Grade of recommendation)	
10. The methods for formulating the recommendations	**Score: 7** Evidence table very clear	**Score: 7**	
11. The health benefits, side effects, and risks	**Score: 5**	**Score: 6**	
12. Explicit link between the recommendations and the supporting evidence.	**Score: 6** Evidence close to recommendation in evidence table	**Score: 6**	
13. Externally reviewed by experts prior to publication	**Score: 4**	**Score: 6**	
14. procedure for updating	**Score: 6** To maintain currency these guidelines will be reviewed and updated by 2016/7.	**Score: 7**	
Domain 4. Clarity of Presentation			**97%**
15. The recommendations are specific and unambiguous	**Score: 7**	**Score: 6**	
16. Options for management of the condition or health issue	**Score: 7**	**Score: 7** e.g. different diet types	
17. Key recommendations	**Score: 7**	**Score: 7** In tables: "Evidence based recommendation"	
Domain 5. Applicability			**95%**
18. facilitators and barriers	**Score: 7** See appendix 2	**Score: 7**	
19. advice and/or tools	**Score: 6**	**Score: 7** Yes: practice points + strategic framework...	
20. Potential resource implications of applying	**Score: 6** See appendix 3	**Score: 7**	
21. The guideline presents monitoring and/or auditing criteria	**Score: 7**	**Score: 7** Appendix 4: Assessment and management summary (targets clearly defined in table)	
Domain 6. Editorial Independence			**96%**
22. Views of the funding body have not influenced the content	**Score: 7** The EWG was responsible for the content of the guidelines with independence from the funding source. A DOHA representative formed part of the Advisory Committee to oversee the process of the guidelines development.	**Score: 6**	
23. Competing interests	**Score: 7** A policy regarding disclosure and management of potential conflicts of interest (COI) was implemented. All Advisory Committee and EWG members completed COI forms and a COI register was maintained and updated regularly. COI were managed in the following manner: • Open disclosure of all COI to all members of the committee and public declaration of all COI in guidelines. • If the COI is deemed significant, individuals may be restricted from involvement in discussions and decisions	**Score: 7**	

	on related topics. This is determined by the chair of the relevant committee and has occurred once. • If the COI is considered exclusionary, the individual will be excluded from membership of the relevant committee or from employment in the guidelines team. This will be determined by the chair of the relevant committee and the CEO of the NSF, the lead agency for this project. This level of COI has been experienced and the relevant member resigned from the committee. A copy of the Conflict of Interest Policy can be supplied on request.		

7.3 Appendix C: included and excluded recommendations of "National Stroke Foundation, Guidelines for the management of absolute cardiovascular disease risk, 2012".

Recommendation	Comments	Decision (inclusion/exclusion)
1. Weight loss should be recommended for people who are overweight or obese.	- Grade B - Lifestyle intervention	Inclusion
2. All adults should be advised to participate in at least 30 minutes of moderate intensity activity on most days or preferably every day of the week.	- Grade B - Lifestyle intervention	Inclusion
4. All smokers should be advised to stop smoking.	- Grade A - Lifestyle intervention	Inclusion
4. Adults with any of the following conditions do not require absolute cardiovascular risk assessment using the Framingham Risk Equation because they are already known to be at clinically determined high risk of CVD: - Diabetes and age >60 years, - Diabetes with microalbuminuria (>20 mcg/min or UACR >2.5 mg/mmol for males, >3.5 mg/mmol for females), - Moderate or severe CKD (persistent proteinuria or eGFR <45 mL/min/1.73 m2), - A previous diagnosis of familial hypercholesterolaemia, - SBP ≥180 mmHg or DBP ≥110 mmHg, - Serum TC >7.5 mmol/L.	- Grade D - Diagnostic procedure recommendation	Exclusion
5. Absolute CVD risk assessment, using the Framingham Risk Equation to predict risk of a cardiovascular event over the next five years, should be performed for all adults aged 45–74 years who are not known to have CVD or to be at clinically determined high risk.	- Diagnostic procedure recommendation	Exclusion
6. In Aboriginal and Torres Strait Islander adults aged 35–74 years who are not known to have CVD or to be at clinically determined high risk, absolute cardiovascular risk over the next five years should be calculated using the Framingham Risk Equation. Although the Framingham Risk Equation might underestimate risk in this population, available evidence suggests that this approach will provide an estimate of minimum cardiovascular risk.	- Grade D - Diagnostic procedure recommendation	Exclusion
7. In adults with diabetes aged 60 years or less who are not known to have CVD or to be at clinically determined high risk, absolute cardiovascular risk over the next five years should be assessed using the Framingham Risk Equation. Although the Framingham Risk Equation might underestimate risk in this population, available evidence suggests that this approach will provide an estimate of minimum cardiovascular risk.	- Grade C - Diagnostic procedure recommendation	Exclusion
8. In adults who are overweight or obese and who are not known to have CVD or to be at clinically determined high risk, absolute cardiovascular risk over the next five years should be assessed using the Framingham Risk Equation. The results should be interpreted with	- Grade D - Diagnostic procedure recommendation	Exclusion

the awareness that its predictive value has not been specifically assessed in this population.		
9. Aspirin or other antiplatelet therapy is not routinely recommended for primary prevention of CVD.	- Pharmacological intervention recommendation	Exclusion
10. Adults at high absolute risk of CVD should be simultaneously treated with lipid and blood pressure-lowering pharmacotherapy in addition to lifestyle intervention unless contraindicated or clinically inappropriate.	- Pharmacological intervention recommendation	Exclusion
11. Treatment should begin with any one of the following agents: • ACE inhibitor • Angiotensin receptor blocker • Calcium channel blocker • Low dose thiazide or thiazide-like diuretic.	- Pharmacological intervention recommendation	Exclusion
12. If monotherapy does not sufficiently reduce blood pressure add a second agent from a different pharmacological class.	- Pharmacological intervention recommendation	Exclusion
13. Statins should be used as first-line therapy.	- Pharmacological intervention recommendation	Exclusion
14. If LDL-C levels are not sufficiently reduced on maximally tolerated dose of statin, one or more of the following may be added: • ezetimibe • bile acid binding resin • nicotinic acid.	- Grade C and D - Pharmacological intervention recommendation	Exclusion
15. Where statins cannot be tolerated at all, one or more of the following can be used: • ezetimibe • bile acid binding resin • nicotinic acid.	- Grade D - Pharmacological intervention recommendation	Exclusion
16. If triglyceride levels remain elevated, treatment with one of the following may be considered: • fenofibrate (especially if HDL is below target) • nicotinic acid • fish oil.	- Grade C - Pharmacological intervention recommendation	Exclusion
17. Blood pressure-lowering therapy in people with diabetes should preferentially include an ACE inhibitor or angiotensin receptor blocker.	- Pharmacological intervention recommendation	Exclusion
18. If monotherapy does not sufficiently reduce blood pressure add one of the following: • Calcium channel blocker • Low-dose thiazide or thiazide-like diuretic.	- Grade B and C - Pharmacological intervention recommendation	Exclusion
19. Blood pressure-lowering therapy in people with CKD should begin with an ACE inhibitor or angiotensin receptor blocker.	- Pharmacological intervention recommendation	Exclusion

7.1 Appendix D: matrix part of "National Stroke Foundation, Guidelines for the management of absolute cardiovascular disease risk, 2012".

Recommendation	References	Survey type	Intervention: yes/no	Intervention description	Inclusion/exclusion
Weight loss should be recommended for people who are overweight or obese.	1.Australian Institute of Health and Welfare 2008. Australia's health 2008. Cat. no. AUS 99. Canberra: AIHW	Report	no	Report on Australian health	Exclusion
	2.Brunner EJ, Rees K, Ward K, Burke M, Thorogood M. Dietary advice for reducing cardiovascular risk. Cochrane Database Syst Rev. 2007(4):CD002128	Meta-analysis of RCT	Yes	38 trials with 46 intervention arms (comparisons) comparing dietary advice with no advice. Dietary advice reduced total serum cholesterol by 0.16 mmol/L (95% CI 0.06 to 0.25) and LDL cholesterol by 0.18 mmol/L (95% CI 0.1 to 0.27) after 3-24 months. Mean HDL cholesterol levels and triglyceride levels were unchanged. Dietary advice reduced blood pressure by 2.07 mmHg systolic (95% CI 0.95 to 3.19) and 1.15 mmHg diastolic (95% CI 0.48 to 1.85) and 24-hour urinary sodium excretion by 44.2 mmol (95% CI 33.6 to 54.7) after 3-36 months	Inclusion
	3.National Health and Medical Research Council. Dietary guidelines for Australian adults. Canberra: NHMRC, 2003.			Not available because has been replace by a new version	Exclusion
	4.Hooper L, Summerbell CD, Higgins JP, Thompson RL, Clements G, Capps N, et al. Reduced or modified dietary fat for preventing cardiovascular disease. Cochrane Database Syst Rev. 2001(3):CD002137	Meta-analysis of RCT	Yes	27 trials. No significant effect of reduction dietary fat on total mortality, trend towards protection from CV mortality, significant protection from CV events.	Inclusion
	5.Bouzan C, Cohen JT, Connor WE, Kris-Etherton PM, Gray GM, Konig A, et al. A quantitative analysis of fish consumption and stroke risk. Am J Prev Med. 2005 Nov;29(4):347-52.	Qualitative literature review of prospective observational cohort and case-control study	No	5 prospective cohort studies, 1 case-control study. Fish consumption confers substantial relative risk reduction compared to no fish consumption (12% for the linear model), with the possibility that additional consumption confers incremental benefits (central estimate of 2.0% per serving per week).	Exclusion
	6.He K, Song Y, Daviglus ML, Liu K, Van Horn L, Dyer AR, et al. Accumulated evidence on fish consumption and coronary heart disease mortality: a meta-analysis of cohort studies. Circulation. 2004 Jun 8;109(22):2705-11.	Meta-analysis of observational studies	No	11 studies, 13 cohorts. Fish consumption vs no fish consumption. RRs for CHD mortality were 0.89 for fish intake 1 to 3 times per month, 0.85 for once per week, 0.77 for 2 to 4 times per week, and 0.62 for 5 or more times per week. Each 20-g/d increase in fish intake was related to a 7% lower risk of CHD mortality (*P* for trend=0.03).	Exclusion
	7.Wang C, Harris WS, Chung M, Lichtenstein AH, Balk EM, Kupelnick B, et al. n-3 Fatty acids from fish or fish-oil supplements, but not alpha-linolenic acid, benefit	Meta-analysis of RCT, cohort studies and case-control	Yes	46 studies. Primary and secondary prevention. N-3 FAs from fish or fish-oil supplements, but not of alpha-linolenic acid, reduces the rates of all-cause	Exclusion

	cardiovascular disease outcomes in primary- and secondary-prevention studies: a systematic review. Am J Clin Nutr. 2006 Jul;84(1):5-17.			mortality, cardiac and sudden death, and possibly.	
	8.Hooper L, Thompson RL, Harrison RA, Summerbell CD, Ness AR, Moore HJ, et al. Risks and benefits of omega 3 fats for mortality, cardiovascular disease, and cancer: systematic review. BMJ. 2006 Apr 1;332(7544):752-60.	Meta-analysis of RCT and cohort studies	Yes	48 trials and 41 cohort studies. Non significant effect of long and shorter chain omega 3 on mortality and CV events	Exclusion
	9.He FJ, MacGregor GA. Effect of modest salt reduction on blood pressure: a meta-analysis of randomized trials. Implications for public health. J Hum Hypertens. 2002 Nov;16(11):761-70.	Meta-analysis of RCT	Yes	17 trials in hypertensives (n=734) and 11 trials in normotensives (n=2220). Median reduction in 24-h urinary sodium excretion: 78 mmol (equivalent to 4.6 g of salt/day) in hypertensives and 74 mmol in normotensives. Pooled estimates of blood pressure fall: 4.96/2.73+/-0.40/0.24 mmHg in hypertensives (P<0.001 for both systolic and diastolic) and 2.03/0.97+/-0.27/0.21 mmHg in normotensives (P<0.001 for both systolic and diastolic).	Inclusion
	10.Hooper L, Bartlett C, Davey SG, Ebrahim S. Advice to reduce dietary salt for prevention of cardiovascular disease. Cochrane Database Syst Rev. 2004(1):CD003656	Meta-analysis of RCT	Yes	11 trials. Restriction dietary sodium vs control group. Reduction of blood pressure in restriction sodium group and easier stop of antihypertensive medication	Inclusion
	11.Dauchet L, Amouyel P, Dallongeville J. Fruit and vegetable consumption and risk of stroke: a meta-analysis of cohort studies. Neurology. 2005 Oct 25;65(8):1193-7.	Meta-analysis of cohort studies	No	7 studies. Fruit and vegetable consumption decrease the risk of stroke. Not available for free.	Exclusion
	12.Dauchet L, Amouyel P, Hercberg S, Dallongeville J. Fruit and vegetable consumption and risk of coronary heart disease: a meta-analysis of cohort studies. J Nutr. 2006 Oct;136(10):2588-93.	Meta-analysis of observational cohort studies	No	9 studies. Risk of CHD decreased by 4% [RR (95% CI): 0.96 (0.93–0.99), $P = 0.0027$] for each additional portion per day of fruit and vegetable intake and by 7% [0.93 (0.89–0.96), $P < 0.0001$] for fruit intake. Association between vegetable intake and CHD risk was heterogeneous ($P = 0.0043$), more marked for cardiovascular mortality [0.74 (0.75–0.84), $P < 0.0001$] than for fatal and nonfatal myocardial infarction [0.95 (0.92–0.99), $P = 0.0058$]	Exclusion
	13.He FJ, Nowson CA, Lucas M, MacGregor GA. Increased consumption of fruit and vegetables is related to a reduced risk of coronary heart disease: meta-analysis of cohort studies. J Hum Hypertens. 2007 Sep;21(9):717-28.	Meta-analysis of observational cohort studies	No	12 studies. RR of coronary heart disease =0.93 in group eating 3-5 fruits/day vs 0.83 in group eating more than 5 fruits	Exclusion
	14.He FJ, Nowson CA, MacGregor GA. Fruit and vegetable consumption and stroke: meta-analysis of cohort studies. Lancet. 2006 Jan 28;367(9507):320-6.	Meta-analysis of observational cohort studies	No	8 studies. RR of stroke = 0.89 in group eating 3-5 fruits/day vs 0.74 in group with more than 5 fruits. Not completely available for free.	Exclusion
	15.Elwood PC, Givens DI, Beswick AD, Fehily AM, Pickering JE, Gallacher J. The survival advantage of milk and dairy consumption: an overview of evidence from cohort	Meta-analysis of cohort studies	No	15 studies. Relative risk of stroke and/or heart disease decrease in high milk consumption group. Not completely available for free.	Exclusion

	studies of vascular diseases, diabetes and cancer. J Am Coll Nutr. 2008 Dec;27(6):723S-34S.				
	16.Anderson JW, Hanna TJ, Peng X, Kryscio RJ. Whole grain foods and heart disease risk. J Am Coll Nutr. 2000 Jun;19(3 Suppl):291S-9S.	Systematic review of cohort study		Not completely available for free	Exclusion
	17.Bazzano LA, He J, Ogden LG, Loria CM, Whelton PK. Dietary fiber intake and reduced risk of coronary heart disease in US men and women: the National Health and Nutrition Examination Survey I Epidemiologic Follow-up Study. Arch Intern Med. 2003 Sep 8;163(16):1897-904.	Prospective cohort study	No	Higher intake of dietary fiber, particularly water-soluble fiber, reduces the risk of CHD	Exclusion
	18.Jacobs DR, Jr., Meyer HE, Solvoll K. Reduced mortality among whole grain bread eaters in men and women in the Norwegian County Study. Eur J Clin Nutr. 2001 Feb;55(2):137-43.	Prospective cohort study	No	Not completely available for free.	Exclusion
	19.Liu S, Manson JE, Stampfer MJ, Rexrode KM, Hu FB, Rimm EB, et al. Whole grain consumption and risk of ischemic stroke in women: A prospective study. JAMA. 2000 Sep 27;284(12):1534-40.	Observational prospective cohort study	No	75,521 US women. 52 confirmed incident cases of ischemic stroke occurred. We observed an inverse association between whole grain intake and ischemic stroke risk. The age-adjusted relative risks (RRs) from the lowest to highest quintiles of whole grain intake were 1.00 (referent), 0.68 (95% confidence interval [CI], 0.49-0.94), 0.69 (95% CI, 0.51-0.95), 0.49 (95% CI, 0.35-0.69), and 0.57 (95% CI, 0.42-0.78; *P* = .003 for trend).	Exclusion
	20.Mozaffarian D, Kumanyika SK, Lemaitre RN, Olson JL, Burke GL, Siscovick DS. Cereal, fruit, and vegetable fiber intake and the risk of cardiovascular disease in elderly individuals. JAMA. 2003 Apr 2;289(13):1659-66.	Prospective cohort study	No	Cereal fiber consumption inversely associated with incident CVD (P for trend =.02), with 21% lower risk (hazard ratio [HR], 0.79; 95% confidence interval [CI], 0.62-0.99) in the highest quintile of intake, compared with the lowest quintile. In similar analyses, neither fruit fiber intake (P for trend =.98) nor vegetable fiber intake (P for trend =.95) were associated with incident CVD	Exclusion
	21.Steffen LM, Jacobs DR, Jr., Stevens J, Shahar E, Carithers T, Folsom AR. Associations of whole-grain, refined-grain, and fruit and vegetable consumption with risks of all-cause mortality and incident coronary artery disease and ischemic stroke: the Atherosclerosis Risk in Communities (ARIC) Study. Am J Clin Nutr. 2003 Sep;78(3):383-90.	Prospective cohort study	No	Relative hazards of death for quintiles 2-5 of fruit and vegetable intake: 1.08 (95% CI: 0.88, 1.33), 0.94 (0.75, 1.17), 0.87 (0.68, 1.10), and 0.78 (0.61, 1.01), respectively; P for trend = 0.02. Inverse association between fruit and vegetable intake and CAD observed among African Americans but not among whites (P for interaction = 0.01). Risk of ischemic stroke not significantly related to whole-grain, refined-grain, or fruit and vegetable consumption	Exclusion
	22.Kelly SA, Summerbell CD, Brynes A, Whittaker V, Frost G. Wholegrain cereals for coronary heart disease. Cochrane	Meta-analysis of RCT	Yes	10 trials. Include adults with CVD or at least 1 risk factor. Non significant effect of wholegrain diet on	Exclusion

	Database Syst Rev. 2007(2):CD005051.			CVD.	
	23.Kelly S, Frost G, Whittaker V, Summerbell C. Low glycaemic index diets for coronary heart disease. Cochrane Database Syst Rev. 2004(4):CD004467.	Meta-analysis of RCT	Yes	15 trials. Low glycaemic index diet does not reduce coronary heart disease and CV risk factor at short-term. 12-months evaluation recommended.	Inclusion
	24.Sofi F, Cesari F, Abbate R, Gensini GF, Casini A. Adherence to Mediterranean diet and health status: meta-analysis. BMJ. 2008;337:a1344	Meta-analysis of cohort studies	No	8 cohorts. Mediterranean diet = reduced risk of mortality, CV mortality, cancer and Parkinson's and Alzheimer's disease	Exclusion
	25.Harland JI, Haffner TA. Systematic review, meta-analysis and regression of randomized controlled trials reporting an association between an intake of circa 25 g soya protein per day and blood cholesterol. Atherosclerosis. 2008 Sep;200(1):13-27.	Meta-analysis of RCT	Yes	30 trials. 25g soya protein in diet of adults with normal or mild hypercholesterolemia diminishes total and LDL cholesterol.	Inclusion
	26.Castro IA, Barroso LP, Sinnecker P. Functional foods for coronary heart disease risk reduction: a meta-analysis using a multivariate approach. Am J Clin Nutr. 2005 Jul;82(1):32-40.	Meta-analysis using a multivariate approach known as principal component analysis	Yes	Phytosterols and soluble fibers had a hypocholesterolemic effect, whereas n-3 fatty acids lowered triacylglycerol and increased total, LDL, and HDL cholesterol.	Exclusion
	27.Flores-Mateo G, Navas-Acien A, Pastor-Barriuso R, Guallar E. Selenium and coronary heart disease: a meta-analysis. Am J Clin Nutr. 2006 Oct;84(4):762-73	Meta-analysis of observational studies and RCT	Both	25 observational studies, 6 RCT. In randomized trials, pooled relative risk in a comparison of supplements containing selenium with placebo: 0.89 (0.68, 1.17).	Inclusion
	28.Dickinson HO, Mason JM, Nicolson DJ, Campbell F, Beyer FR, Cook JV, et al. Lifestyle interventions to reduce raised blood pressure: a systematic review of randomized controlled trials. J Hypertens. 2006 Feb;24(2):215-33.	Meta-analysis of RCT	Yes	105 trials. Statistically significant effects found for improved diet, aerobic exercise, alcohol and sodium restriction, and fish oil supplements: mean reductions in systolic blood pressure of 5.0 mmHg [95% confidence interval (CI): 3.1-7.0], 4.6 mmHg (95% CI: 2.0-7.1), 3.8 mmHg (95% CI: 1.4-6.1), 3.6 mmHg (95% CI: 2.5-4.6) and 2.3 mmHg (95% CI: 0.2-4.3), respectively, with corresponding reductions in diastolic blood pressure	Inclusion
	29.Avenell A, Broom J, Brown TJ, Poobalan A, Aucott L, Stearns SC, et al. Systematic review of the long-term effects and economic consequences of treatments for obesity and implications for health improvement. Health Technol Assess. 2004 May;8(21):iii-iv, 1-182.	Systematic review (SR) of RCT, epidemiological SR and economic SR	Both	SR of obesity treatments, SR on effects of weight loss on mortality and/or morbidity, SR on costs and outcomes of treatment	Exclusion
	30.Hession M, Rolland C, Kulkarni U, Wise A, Broom J. Systematic review of randomized controlled trials of low-carbohydrate vs. low-fat/low-calorie diets in the management of obesity and its comorbidities. Obes Rev. 2009 Jan;10(1):36-50.	Meta-analysis of RCT	Yes	13 trials. Low-carbohydrate/high-protein diets more effective at 6 months and as effective, as low-fat diets in reducing weight and CVD disease risk up to 1 year.	Inclusion
	31.Shaw K, Gennat H, O'Rourke P, Del Mar C. Exercise for overweight or obesity. Cochrane Database Syst Rev. 2006(4):CD003817.	Meta-analysis of RCT	Yes	43 studies. Physical exercise efficient in weight loss, particularly combined with dietary change and improve CV risk factors	Inclusion
	32.Witham MD, Avenell A. Interventions to achieve long-	Systematic review	Yes	9 trials. Patient with CVD. Interventions modestly	Exclusion

	term weight loss in obese older people: a systematic review and meta-analysis. Age Ageing. 2010 Mar;39(2):176-84.	and meta-analysis of RCT		significant in elderly people to reduce weight, not significant about CVD risk factor	
	33.Whelton PK, Appel LJ, Espeland MA, Applegate WB, Ettinger WH, Jr., Kostis JB, et al. Sodium reduction and weight loss in the treatment of hypertension in older persons: a randomized controlled trial of nonpharmacologic interventions in the elderly (TONE). TONE Collaborative Research Group. JAMA. 1998 Mar 18;279(11):839-46.	RCT	yes	875 men and women aged 60 to 80 years. Obese participants with reduced intake of sodium, weight loss or both vs usual care and nonobese with reduced intake of sodium vs usual care. Reduced intake sodium and weight loss = nonpharmacologic treatment efficient on hypertension on elderlies	Inclusion
	34.Neter JE, Stam BE, Kok FJ, Grobbee DE, Geleijnse JM. Influence of weight reduction on blood pressure: a meta-analysis of randomized controlled trials. Hypertension. 2003 Nov;42(5):878-84.	Meta-analysis of RCT	Yes	35 trials. Weight reduction of -5.1 kg = -4.44 mmHg of systolic and -3.57 of diastolic blood pressure with diet and/or physical activity	Inclusion
	35. Mulrow CD, Chiquette E, Angel L, Cornell J, Summerbell C,Anagnostelis B et al. Dieting to reduce body weight for controlling hypertension in adults. The Cochrane Library, Issue 2, 2004.Chichester; JohnWiley.			Update available on the internet, old version does not exist anymore	Exclusion
All adults should be advised to participate in at least 30 minutes of moderate intensity activity on most days or preferably every day of the week.	36.Caspersen CJ, Powell KE, Christenson GM. Physical activity, exercise, and physical fitness: definitions and distinctions for health-related research. Public Health Rep. 1985 Mar-Apr;100(2):126-31.	Not a study (only definition)			Exclusion
	37.Dunstan DW, Barr EL, Healy GN, Salmon J, Shaw JE, Balkau B, et al. Television viewing time and mortality: the Australian Diabetes, Obesity and Lifestyle Study (AusDiab). Circulation. 2010 Jan 26;121(3):384-91.	RCT	Yes	Hazard ratios for each 1-hour increment in television viewing time per day were 1.11 (95% confidence interval [CI], 1.03 to 1.20) for all-cause mortality, 1.18 (95% CI, 1.03 to 1.35) for CVD mortality, and 1.09 (95% CI, 0.96 to 1.23) for cancer mortality. Compared with a television viewing time of <2 h/d, fully adjusted hazard ratios for all-cause mortality were 1.13 (95% CI, 0.87 to 1.36) for > or =2 to <4 h/d and 1.46 (95% CI, 1.04 to 2.05) for > or =4 h/d. For CVD mortality, corresponding hazard ratios were 1.19 (95% CI, 0.72 to 1.99) and 1.80 (95% CI, 1.00 to 3.25).	Inclusion
	38.Katzmarzyk PT, Church TS, Craig CL, Bouchard C. Sitting time and mortality from all causes, cardiovascular disease, and cancer. Med Sci Sports Exerc. 2009 May;41(5):998-1005	Observational prospective cohort study	No	Higher risk of mortality across higher levels of sitting time from all causes (hazard ratios (HR): 1.00, 1.00, 1.11, 1.36, 1.54; P for trend <0.0001) and CVD (HR:1.00, 1.01, 1.22, 1.47, 1.54; P for trend <0.0001) but not cancer.	Exclusion
	39.Hamer M, Chida Y. Walking and primary prevention: a meta-analysis of prospective cohort studies. Br J Sports Med. 2008 Apr;42(4):238- 43.	Meta-analysis of prospective cohort studies	No	Hazard ratio of CVD in the highest walking category compared with the lowest was 0.69, (95% CI 0.61 to 0.77, p<0.001), and 0.68 (0.59 to 0.78, p<0.001) for all-cause mortality	Exclusion
	40.Lollgen H, Bockenhoff A, Knapp G. Physical activity and all-cause mortality: an updated meta-analysis with different	Meta-analysis of prospective cohort	No	38 studies. Highly active men had a 22% lower risk of all-cause mortality (RR=0.78; 95% CI: 0.72 to	Exclusion

	intensity categories. Int J Sports Med. 2009 Mar;30(3):213-24	studies		0.84) compared to mildly active men. For women, the relative risk was 0.69 (95% CI: 0.53 to 0.90).	
	41.Nocon M, Hiemann T, Muller-Riemenschneider F, Thalau F, Roll S, Willich SN. Association of physical activity with all-cause and cardiovascular mortality: a systematic review and meta-analysis. Eur J Cardiovasc Prev Rehabil. 2008 Jun;15(3):239-46	SR and meta-analysis of cohort studies	No	33 studies. Physical activity associated with a risk reduction of 35% (95% confidence interval, 30-40%) in CV mortality. All-cause mortality reduced by 33% (95% confidence interval, 28-37%).	Exclusion
	42.Shiroma EJ, Lee IM. Physical activity and cardiovascular health: lessons learned from epidemiological studies across age, gender, and race/ethnicity. Circulation. 2010 Aug 17;122(7):743-52.	Narrative review	No		Exclusion
	43.Woodcock J, Franco OH, Orsini N, Roberts I. Non-vigorous physical activity and all-cause mortality: systematic review and meta-analysis of cohort studies. Int J Epidemiol. 2010 Jul 14	SR and meta-analysis of cohort studies	No	22 studies. 2.5 h/week compared with no activity was associated with a reduction in mortality risk of 19%, 7 h/week of moderate activity compared with no activity reduced the mortality risk by 24%.	Exclusion
	44.Hu G, Tuomilehto J, Silventoinen K, Barengo N, Jousilahti P. Joint effects of physical activity, body mass index, waist circumference and waist-to-hip ratio with the risk of cardiovascular disease among middle-aged Finnish men and women. Eur Heart J. 2004 Dec;25(24):2212-9.	Prospective study	No	Physical activity and normal weight can reduce the risk of CVD.	Exclusion
	45.Pal S, Cheng C, Egger G, Binns C, Donovan R. Using pedometers to increase physical activity in overweight and obese women: a pilot study. BMC Public Health. 2009;9:309	RCT	Yes	Pedometer user vs group control. Pedometer group significantly increased their steps/day by 36%, control group's physical activity levels remained unchanged. No significant difference in weight or body fat composition in the pedometer group vs the control group. Significant decrease in systolic blood pressure in the pedometer group (112.8 +/- 2.44 mm Hg) vs the control group (117.3 +/- 2.03 mm Hg)	Inclusion
	46.Pazoki R, Nabipour I, Seyednezami N, Imami SR. Effects of a community-based healthy heart program on increasing healthy women's physical activity: a randomized controlled trial guided by Community-based Participatory Research (CBPR). BMC Public Health. 2007;7:216.	RCT	Yes	Intervention group: 8-week lifestyle modification program for increasing their physical activity.	Inclusion
	47.Pedersen MT, Blangsted AK, Andersen LL, Jorgensen MB, Hansen EA, Sjogaard G. The effect of worksite physical activity intervention on physical capacity, health, and productivity: a 1-year randomized controlled trial. J Occup Environ Med. 2009 Jul;51(7):759-70.	RCT	Yes	Not available for free on the internet	Exclusion
	48.Racette SB, Deusinger SS, Inman CL, Burlis TL, Highstein GR, Buskirk TD, et al. Worksite Opportunities for Wellness (WOW): effects on cardiovascular disease risk factors after 1 year. Prev Med. 2009 Aug-Sep;49(2-3):108-14.	RCT	Yes	123 participants. Assessments + physical activity and favorable dietary patterns vs. assessments only for 1 year. Improvements ($P \leq 0.05$) observed at both worksites for fitness, blood pressure, and total-, HDL-, and LDL-cholesterol.	Inclusion

	49.Carroll S, Dudfield M. What is the relationship between exercise and metabolic abnormalities? A review of the metabolic syndrome. Sports Med. 2004;34(6):371-418.	Narrative review	No		Exclusion
	50.Orozco LJ, Buchleitner AM, Gimenez-Perez G, Roque IFM, Richter B, Mauricio D. Exercise or exercise and diet for preventing type 2 diabetes mellitus. Cochrane Database Syst Rev. 2008(3):CD003054.	Meta-analysis of RCT	Yes	8 trials with exercise plus diet (2241 participants) and a standard recommendation arm. Two studies with a diet only and exercise only arm. exercise plus diet interventions reduced the risk of diabetes compared with standard recommendations (RR 0.63, 95% CI 0.49 to 0.79).	Inclusion
	51.Thomas DE, Elliott EJ, Naughton GA. Exercise for type 2 diabetes mellitus. Cochrane Database Syst Rev. 2006;3:CD002968.	Meta-analysis of RCT	Yes	14 RCT. Exercise against no exercise in type 2 diabetes. Exercise intervention significantly improved glycaemic control as indicated by a decrease in glycated haemoglobin levels of 0.6% (-0.6 % HbA1c, 95% confidence interval (CI) -0.9 to -0.3; P < 0.05).	Inclusion
All smokers should be advised to stop smoking.	52.Anthonisen NR, Skeans MA, Wise RA, Manfreda J, Kanner RE, Connett JE. The effects of a smoking cessation intervention on 14.5-year mortality: a randomized clinical trial. Ann Intern Med. 2005 Feb 15;142(4):233-9.	RCT	Yes	3 groups. Intensive smoking cessation program vs usual care. 14.5 years follow-up. All-cause mortality significantly lower in special intervention group than in usual care group	Inclusion
	53.Doll R, Peto R, Boreham J, Sutherland I. Mortality in relation to smoking: 50 years' observations on male British doctors. BMJ. 2004 Jun 26;328(7455):1519.	Prospective study	No	Male British doctors during 50 years. Cessation at age 60, 50, 40, or 30 years gained about 3, 6, 9, or 10 years of life expectancy. Smokers born in 1900s died younger than those born in 1920s. due to prevention	Exclusion
	54.Ellingsen I, Hjermann I, Abdelnoor M, Hjerkinn EM, Tonstad S. Dietary and antismoking advice and ischemic heart disease mortality in men with normal or high fasting triacylglycerol concentrations: a 23-y follow-up study. Am J Clin Nutr. 2003 Nov;78(5):935-40.	RCT	Yes	Lifestyle intervention group vs group control for during 5 years. Observation 23 years later. High triacylglycerol = 8.13 % of deaths in intervention group vs 14.2% in group control. No detectable effect of intervention in normal triacylglycerol group	Inclusion
	55.Huhtasaari F, Lundberg V, Eliasson M, Janlert U, Asplund K. Smokeless tobacco as a possible risk factor for myocardial infarction: a population-based study in middle-aged men. J Am Coll Cardiol. 1999 Nov 15;34(6):1784-90.	Prospective cohort study	No	Smokers vs non-smokers. CVD not increasing in smokers group but low fatal cases	Exclusion
	56.Jacobs EJ, Thun MJ, Apicella LF. Cigar smoking and death from coronary heart disease in a prospective study of US men. Arch Intern Med. 1999 Nov 8;159(20):2413-8.	Prospective cohort study	No	CV deaths higher in less 74 years cigar smokers (RR 1.30). Deaths rate not increased over 75 years people (RR 0.93)	Exclusion
	57.Kawachi I, Colditz GA, Stampfer MJ, Willett WC, Manson JE, Rosner B, et al. Smoking cessation in relation to total mortality rates in women. A prospective cohort study. Ann Intern Med. 1993 Nov 15;119(10):992-1000.	Prospective cohort study	No	Multivariate RR for total mortality compared with never smokers = 1.87 for current smokers and 1.29 for former smokers. Higher risk of deaths when started young. 24% reduction in risk for CVD mortality within 2 years of quitting.	Exclusion
	58.Prescott E, Scharling H, Osler M, Schnohr P. Importance of	Prospective cohort	No	3-5 grams of tobacco smokers or not inhaling the	Exclusion

	light smoking and inhalation habits on risk of myocardial infarction and all cause mortality. A 22 year follow up of 12 149 men and women in The Copenhagen City Heart Study. J Epidemiol Community Health. 2002 Sep;56(9):702-6.	study		smoke have significant increased risk of CVD and all causes mortality, particularly among women.	
	59.Sauer WH, Berlin JA, Strom BL, Miles C, Carson JL, Kimmel SE. Cigarette yield and the risk of myocardial infarction in smokers. Arch Intern Med. 2002 Feb 11;162(3):300-6.	Case-control study	No	Case: smokers with first myocardial infarction. Smoking higher-yield cigarettes associated with an increased risk of CVD, and there is a dose-response relationship between total tar consumption per day and CVD.	Exclusion
	60.Wannamethee SG, Shaper AG, Whincup PH, Walker M. Smoking cessation and the risk of stroke in middle-aged men. JAMA. 1995 Jul 12;274(2):155-60.	Prospective cohort study	No	Smokers: nearly fourfold RR of stroke compared with never smokers. Ex—cigarette smokers: lower risk than current smokers, excess risk compared with never smokers. Those who switched to pipe or cigar smoking showed a significantly increased risk similar to that of current light smokers. Primary pipe or cigar smokers: increased risk but the number of subjects involved was small	Exclusion
	61.Oberg M, Jaakkola MS, Woodward A, Peruga A, Pruss-Ustun A. Worldwide burden of disease from exposure to second-hand smoke: a retrospective analysis of data from 192 countries. Lancet. 2011 Jan 8;377(9760):139-46.	Retrospective study	No	Second-hand smoke caused 379,000 deaths from ischaemic heart disease, 165,000 from lower respiratory infections, 36,900 from asthma, and 21,400 from lung cancer in 2004. 1% of worldwide mortality caused by second-hand smoke	Exclusion
	62.Ockene IS, Miller NH. Cigarette smoking, cardiovascular disease, and stroke: a statement for healthcare professionals from the American Heart Association. American Heart Association Task Force on Risk Reduction. Circulation. 1997 Nov 4;96(9):3243-7.			Not available on internet.	Exclusion
	63.Unal B, Critchley J, Capewell S. Impact of smoking reduction on coronary heart disease mortality trends during 1981-2000 in England and Wales. Tob Induc Dis. 2003;1(3):185.	Observational study	No	Smoking prevalence decline in 2000 compared to 1981	Exclusion
	64.Stead LF, Perera R, Bullen C, Mant D, Lancaster T. Nicotine replacement therapy for smoking cessation. Cochrane Database of Systematic Reviews. 2008;Issue 1:Art. No.: CD000146. DOI: 10.1002/14651858.CD000146.pub3	Meta-analysis of RCT	Yes	Effect of NRT vs placebo on smoking cessation and difference of effect between different form of NRT to stop tobacco	Exclusion
	65.Hughes JR, Stead LF, Lancaster T. Antidepressants for smoking cessation. Cochrane database of systematic reviews. 2007;Issue 1:CD000031.	Meta-analysis of RCT	Yes	Effect of antidepressant medications in aiding long-term smoking cessation. 53 trials	Exclusion
	66.Cahill K, Stead LF, Lancaster T. Nicotine receptor partial agonists for smoking cessation. Cochrane database of systematic reviews. 2011;Issue 2:Art. No.: CD006103. DOI: 10.1002/14651858.	Meta-analysis of RCT	Yes	Medication vs placebo	Exclusion

	CD006103.pub5.				
	67.Lancaster T, Stead LF. Individual behavioural counselling for smoking cessation. Cochrane Database of Systematic Reviews. 2005;Issue 2:Art. No.: CD001292. DOI: 10.1002/14651858.CD001292.	SR of RCT	Yes	Behavioral therapy for smoking cessation: The relative risk (RR) for smoking cessation at long-term follow up was 1.39, 95% confidence interval (CI) 1.24 to 1.57	Inclusion
	68.Stead LF, Lancaster T. Group behaviour therapy programmes for smoking cessation. Cochrane Database of Systematic Reviews. 2005;Issue 2:Art No: CD001007 DOI: 101002/14651858CD001007pub2.	SR of RCT	yes	Behavioral therapy for smoking cessation: OR 2.04, 95% confidence interval (CI) 1.60 to 2.60).	Inclusion
	69.Rice VH, Stead LF. Nursing interventions for smoking cessation. Cochrane Database of Systematic Reviews. 2008;Issue 1:Art. No.: CD001188.pub2. DOI: 10.1002/14651858.CD001188.pub2.	SR of RCT	Yes	Nursing intervention to a control or to usual care found the intervention to significantly increase the likelihood of quitting (RR 1.28, 95% CI 1.18 to 1.38). 42 trials	Inclusion
	70.Sinclair HK, Bond CM, Stead LF. Community pharmacy personnel interventions for smoking cessation. Cochrane database of systematic reviews 2004;Issue 1:CD003698.	SR of RCT	Yes	2 trials. One study showed a significant difference in self-reported cessation rates at 12 months: 14.3% versus 2.7% ($p < 0.001$); the other study showed a positive trend at each follow-up with 12.0% versus 7.4% ($p = 0.09$) at nine months.	Inclusion
	71.Stead LF, Bergson G, Lancaster T. Physician advice for smoking cessation. Cochrane Database of Systematic Reviews. 2008;Issue 2:Art. No.: CD000165. DOI: 10.1002/14651858.CD000165.pub3.	SR and meta-analysis of RCT	yes	41 trials. In primary and secondary care.	Exclusion
	72.Stead LF, Perera R, Lancaster T. Telephone counselling for smoking cessation. Cochrane Database of Systematic Reviews. 2006;Issue 3:Art. No.: CD002850. DOI: 10.1002/14651858.CD002850.pub2.	SR of randomized or quasi-randomized controlled trial	Yes	Teenagers and pregnant woman also included	Exclusion
	73.Civljak M, Sheikh A, Stead LF, Car J. Internet-based interventions for smoking cessation. Cochrane Database of Systematic Reviews. 2010;Issue 9:Art. No.: CD007078. DOI: 10.1002/14651858. CD007078.pub3.	SR of RCT and quasi-randomized controlled trial	yes	20 studies. Internet intervention. Teenagers also included	Exclusion
	74.Yusuf S, Hawken S, Ounpuu S, Dans T, Avezum A, Lanas F, et al. Effect of potentially modifiable risk factors associated with myocardial infarction in 52 countries (the INTERHEART study): case-control study. Lancet. 2004 Sep 11-17;364(9438):937-52.	Case-control study	No	Smoking (odds ratio 2.87 for current vs never, PAR 35.7% for current and former vs never) significantly related to acute myocardial infarction	Exclusion

7.2 Appendix E: references included and excluded from "Canadian Diabetes Association, Clinical practice guidelines for the prevention and management of diabetes in Canada, 2013".

Recommendations	Comments	Decision (inclusion/exclusion)
1.Diabetes should be diagnosed by any of the following criteria: – Fasting Plasma Glucose (FPG) > or =7.0 mmol/L – Glycated hemoglobin (A1C) > or =6.5% (for use in adults in the absence of factors that affect the accuracy of A1C and not for use in those with suspected type 1 diabetes) – 2-hour Plasma Glucose (2hPG) in a 75 g Oral Glucose Tolerance Test (OGTT) > or =11.1 mmol/L – Random Plasma Glucose (PG) > or =11.1 mmol/L	– Grade B and D – Diagnostic recommendation	Exclusion
2.In the absence of symptomatic hyperglycemia, if a single laboratory test result is in the diabetes range, a repeat confirmatory laboratory test (FPG, A1C, 2hPG in a 75 g OGTT) must be done on another day. It is preferable that the same test be repeated (in a timely fashion) for confirmation, but a random PG in the diabetes range in an asymptomatic individual should be confirmed with an alternate test. In the case of symptomatic hyperglycemia, the diagnosis has been made and a confirmatory test is not required before treatment is initiated. In individuals in whom type 1 diabetes is likely (younger or lean or symptomatic hyperglycemia, especially with ketonuria or ketonemia), confirmatory testing should not delay initiation of treatment to avoid rapid deterioration. If results of two different tests are available and both are above the diagnostic cutpoints, the diagnosis of diabetes is confirmed.	– Grade D – Diagnostic recommendation	Exclusion
3.Prediabetes (defined as a state which places individuals at high risk of developing diabetes and its complications) is diagnosed by any of the following criteria: – Impaired Fasting Glucose (IFG) [Fasting Plasma Glucose (FPG) 6.1-6.9 mmol/L], – Impaired Glucose Tolerance (IGT) (2hPG in a 75 g OGTT 7.8-11.0 mmol/L), – A1C 6.0%-6.4% (for use in adults in the absence of factors that affect the accuracy of A1C and not for use in suspected type 1 diabetes).	– Grade A and B – Diagnostic recommendation	Exclusion
4.All individuals should be evaluated annually for type 2 diabetes risk on the basis of demographic and clinical criteria.	– Grade D – Diagnostic recommendation	Exclusion
5.Screening for diabetes using FPG and/or A1C should be performed every 3 years in individuals > or =40 years of age or at high risk using a risk calculator. More frequent and/or earlier testing with either FPG and/or A1C or 2hPG in a 75 g OGTT should be considered in those at very high risk using a risk calculator or in people with additional risk factors for diabetes. These risk factors include: – First-degree relative with type 2 diabetes, – Member of high-risk population (e.g. Aboriginal, African, Asian, Hispanic or South Asian descent), – History of prediabetes (IGT, IFG, or A1C 6.0%-6.4%), – History of gestational diabetes mellitus, – History of delivery of a macrosomic infant, – Presence of end organ damage complications associated with diabetes: • Microvascular (retinopathy, neuropathy, nephropathy), • Macrovascular (coronary, cerebrovascular, peripheral), – Presence of vascular risk factors: • HDL cholesterol <1.0 mmol/L in males, <1.3 mmol/L in females, • Triglycerides > or =1.7 mmol/L, • Hypertension, • Overweight, • Abdominal obesity, – Presence of associated diseases: • Polycystic ovary syndrome, • Acanthosis nigricans, • Obstructive sleep apnea, • Psychiatric disorders (bipolar disorder, depression,	– Grade D – Diagnostic recommendation	Exclusion

schizophrenia), • HIV infection, – Use of drugs associated with diabetes: • Glucocorticoids, • Atypical antipsychotics, • Highly Active Antiretroviral Therapy (HAART), • Other, – Other secondary causes.		
6.Testing with 2hPG in a 75 g OGTT should be undertaken in individuals with FPG 6.1-6.9 mmol/L and/or A1C 6.0%-6.4% in order to identify individuals with IGT or diabetes.	– Grade D – Diagnostic recommendation	Exclusion
7.Testing with 2hPG in a 75 g OGTT may be undertaken in individuals with FPG 5.6-6.0 mmol/L and/or A1C 5.5%-5.9% and > or =1 risk factor(s) in order to identify individuals with IGT or diabetes.	– Grade D – Diagnostic recommendation	Exclusion
8.A structured program of lifestyle modification that includes moderate weight loss and regular physical activity should be implemented to reduce the risk of type 2 diabetes in individuals with IGT and IFG and A1C 6.0%-6.4%.	– Grade D for A1C 6.0%-6.4%, grade A for people with IGT and B for people with IFG – Lifestyle recommendation	Exclusion
9.In individuals with IGT, pharmacological therapy with metformin or acarbose may be used to reduce the risk of type 2 diabetes.	– Grade A – Pharmacology recommendation	Exclusion
10.Diabetes care should be proactive, incorporate elements of the chronic care model (CCM), and be organized around the person living with diabetes who is supported in self-management by an interprofessional team with specific training in diabetes.	– Grade C – Follow-up recommendation	Exclusion
11.The following quality improvement strategies should be used, alone or in combination, to improve glycemic control: a) Promotion of self-management b) Team changes c) Disease (case) management d) Patient education e) Facilitated relay of clinical information f) Electronic patient registries g) Patient reminders h) Audit and feedback i) Clinician education j) Clinician reminders (with or without decision support)	– Grade A – Follow-up recommendation	Inclusion
12.Diabetes care management by an interprofessional team with specific training in diabetes and supported by specialist input should be integrated within diabetes care delivery models in the primary care and specialist care settings.	– Grade A and D – Specialist care – Follow-up recommendation	Exclusion
13.The role of the diabetes case manager should be enhanced, in cooperation with the collaborating physician, including interventions led by a nurse, pharmacist or dietitian, to improve coordination of care and facilitate timely diabetes management changes.	– Grade A and B – Follow-up organization recommendation	Exclusion
14.As part of a collaborative, shared care approach within the CCM, an interprofessional team with specialized training in diabetes, and including a physician diabetes expert, should be used in the following groups: a) Children with diabetes. b) Type 1 diabetes . c) Women with diabetes who require preconception counselling and women with diabetes in pregnancy. d) Individuals with complex (multiple diabetes-related complications) type 2 diabetes who are not reaching targets.	– Grade C and D – Population excluded – Follow-up recommendation	Exclusion
15.Telehealth technologies may be used as part of a disease management program to: 1. Improve self-management in underserviced communities. 2. Facilitate consultation with specialized teams as part of a shared-care model.	– Grade A and B – Follow-up organization recommendation	Inclusion
16.People with diabetes should be offered timely diabetes education that is tailored to enhance self-care practices and behaviours.	– Grade A – Education recommendation	Inclusion
17.All people with diabetes who are able should be taught how to self-manage their diabetes.	– Grade A – Education recommendation	Inclusion

18.Self-Management Education (SME) that incorporates cognitive-behavioural educational interventions, such as problem solving, goal setting, and self-monitoring of health parameters, should be implemented for all individuals with diabetes.	– Grade B – Education recommendation	Inclusion
19.Interventions that increase patient participation and collaboration in healthcare decision making should be used by providers.	– Grade B – Education recommendation	Inclusion
20.For people with type 2 diabetes, SME interventions should be offered in small group and/or one-on-one settings, since both may be effective.	– Grade A – Education recommendation	Inclusion
21.In both type 1 and 2 diabetes, interventions that target families' ability to cope with stress or diabetes-related conflict should be included in educational interventions when indicated.	– Grade B – Education recommendation	Inclusion
22.Technologically based home blood glucose monitoring systems may be integrated into SME interventions in order to improve glycemic control.	– Grade C – Education recommendation	Exclusion
23.Culturally appropriate SME, which may include peer or lay educators, may be used to increase diabetes-related knowledge and self-care behaviours and to decrease A1C.	– Grade B – Education recommendation – Concern minority population	Exclusion
24.Adding literacy- and numeracy-sensitive materials to a comprehensive diabetes management and education program may be used to improve knowledge, self-efficacy and A1C outcomes for patients with low literacy.	– Grade C – Education recommendation	Exclusion
25.Glycemic targets should be individualized based on age, duration of diabetes, risk of severe hypoglycemia, presence or absence of cardiovascular disease, and life expectancy.	– Grade D – Treatment objectives recommendation	Exclusion
26.Therapy in most individuals with type 1 or type 2 diabetes should be targeted to achieve an A1C < or = 7.0% in order to reduce the risk of microvascular and, if implemented early in the course of disease, macrovascular complications.	– Grade A and B – Treatment objectives recommendation	Exclusion
27.An A1C < or =6.5% may be targeted in some patients with type 2 diabetes to further lower the risk of nephropathy and retinopathy, but this must be balanced against the risk of hypoglycemia.	– Grade A – Treatment objectives recommendation	Exclusion
28.Less stringent A1C targets (7.1%-8.5% in most cases) may be appropriate in patients with type 1 or type 2 diabetes with any of the following: a) Limited life expectancy, b) High level of functional dependency, c) Extensive coronary artery disease at high risk of ischemic events, d) Multiple comorbidities, e) History of recurrent severe hypoglycemia, f) Hypoglycemia unawareness, g) Longstanding diabetes for whom it is difficult to achieve an A1C < or =7.0% despite effective doses of multiple antihyperglycemic agents, including intensified basal-bolus insulin therapy.	– Grade D – Treatment objectives recommendation	Exclusion
29.In order to achieve an A1C < or =7.0%, people with diabetes should aim for: – FPG or preprandial PG target of 4.0-7.0 mmol/L and a 2-hour PPG target of 5.0-10.0 mmol/L. – If an A1C target < or = 7.0% cannot be achieved with a PPG target of 5.0-10.0 mmol/L, further PPG lowering to 5.0-8.0 mmol/L should be.	– Grade B and D – Treatment objectives recommendation	Exclusion
30.For most individuals with diabetes, A1C should be measured every 3 months to ensure that glycemic goals are being met or maintained. Testing at least every 6 months should be performed in adults during periods of treatment and lifestyle stability when glycemic targets have been consistently achieved.	– Grade D – Education recommendation	Exclusion
31.For individuals using insulin more than once a day, SMBG should be used as an essential part of diabetes self-management and should be undertaken at least 3 times per day and include both pre- and postprandial measurements. In those with type 2 diabetes on once-daily insulin in addition to oral antihyperglycemic agents, testing at least once a day at variable times is recommended.	– Grade D – Education recommendation	Exclusion
32.For individuals with type 2 diabetes not receiving insulin therapy, SMBG recommendations should be individualized depending on type of antihyperglycemic agents, level of glycemic control and risk of hypoglycemia. – When glycemic control is not being achieved, SMBG should be instituted and should include periodic pre- and postprandial measurements and training of healthcare providers and patients on methods to modify lifestyle	– Grade B and D – Education recommendation	Exclusion

and medications in response to SMBG values. – If achieving glycemic targets or receiving medications not associated with hypoglycemia, infrequent SMBG is appropriate.		
33.In many situations, for all individuals with diabetes, more frequent testing should be undertaken to provide information needed to make behavioural or treatment adjustments required to achieve desired glycemic targets and avoid risk of hypoglycemia.	– Grade D – Education recommendation	Exclusion
34.In people with type 1 diabetes, real-time continuous glucose monitoring may be used to improve glycemic control and reduce hypoglycemia.	– Grade B – Education recommendation for type 1 diabetes	Exclusion
35.In order to ensure accuracy of BG meter readings, meter results should be compared with laboratory measurement of simultaneous venous FPG at least annually and when indicators of glycemic control do not match meter readings.	– Grade D – Education recommendation	Exclusion
36.Individuals with type 1 diabetes should be instructed to perform ketone testing during periods of acute illness accompanied by elevated BG, when preprandial BG levels remain >14.0 mmol/L or in the presence of symptoms of DKA. Blood ketone testing methods may be preferred over urine ketone testing, as they have been associated with earlier detection of ketosis and response to treatment.	– Grade B and D – Diagnostic recommendation for type 1 diabetes	Exclusion
37.People with diabetes should accumulate a minimum of 150 minutes of moderate-to vigorous-intensity aerobic exercise each week, spread over at least 3 days of the week, with no more than 2 consecutive days without exercise.	– Grade B for type 2 diabetes, grade C for type 1 – Lifestyle recommendation	Inclusion
38.People with diabetes (including elderly people) should perform resistance exercise at least twice a week and preferably 3 times per week in addition to aerobic exercise. Initial instruction and periodic supervision by an exercise specialist are recommended.	– Grade B for the recommendation excepted grade C for "Initial instruction and periodic supervision by an exercise specialist are recommended." – Lifestyle recommendation	Inclusion
39.People with diabetes should set specific physical activity goals, anticipate likely barriers to physical activity (e.g. weather, competing commitments), develop strategies to overcome these barriers and keep records of their physical activity.	– Grade B – Lifestyle recommendation	Inclusion
40.Structured exercise programs supervised by qualified trainers should be implemented when feasible for people with type 2 diabetes to improve glycemic control, CVD risk factors and physical fitness.	– Grade B – Lifestyle recommendation	Inclusion
41.People with diabetes with possible CVD or microvascular complications of diabetes who wish to undertake exercise that is substantially more vigorous than brisk walking should have medical evaluation for conditions that might increase exercise-associated risk. The evaluation would include history, physical examination (including funduscopic exam, foot exam, and neuropathy screening), resting ECG and, possibly, exercise ECG stress testing.	– Grade D – Secondary prevention	Exclusion
42.People with diabetes should receive nutrition counselling by a registered dietitian to lower A1C levels and to reduce hospitalization rates.	– Grade B for type 2 diabetes, D for type 1 and C for the reduction of hospitalization rate. – Education recommendation	Inclusion
43.Nutrition education is effective when delivered in either a small group or a one-on-one setting. Group education should incorporate adult education principles, such as hands-on activities, problem solving, role playing and group discussions.	– Grade B – Education recommendation	Inclusion
44.Individuals with diabetes should be encouraged to follow Eating Well with Canada's Food Guide in order to meet their nutritional needs.	– Grade D – Lifestyle recommendation	Exclusion
45.In overweight or obese people with diabetes, a nutritionally balanced, calorie-reduced diet should be followed to achieve and maintain a lower, healthier body weight.	– Grade A – Lifestyle recommendation	Inclusion
46.In adults with diabetes, the macronutrient distribution as a percentage of total energy can range from 45% to 60% carbohydrate, 15% to 20% protein and 20% to 35% fat to allow for individualization of nutrition therapy based on preferences and treatment goals.	– Grade D – Lifestyle recommendation	Exclusion
47.Adults with diabetes should consume no more than 7% of total daily energy from saturated fats and should limit intake of trans fatty acids to a minimum.	– Grade D – Lifestyle recommendation	Exclusion
48.Added sucrose or added fructose can be substituted for other carbohydrates as part of mixed meals up to a maximum of 10% of total daily energy intake, provided	– Grade C – Lifestyle recommendation	Exclusion

adequate control of BG and lipids is maintained.		
49.People with type 2 diabetes should maintain regularity in timing and spacing of meals to optimize glycemic control.	– Grade D – Lifestyle recommendation	Exclusion
50.Dietary advice may emphasize choosing carbohydrate food sources with a low glycemic index to help optimize glycemic control.	– Grade B – Lifestyle intervention	Inclusion
51.Alternative dietary patterns may be used in people with type 2 diabetes to improve glycemic control, (including): a. Mediterranean-style dietary pattern. b. Vegan or vegetarian dietary pattern. c. Incorporation of dietary pulses (e.g. beans, peas, chick peas, lentils). d. Dietary Approaches to Stop Hypertension (DASH) dietary pattern.	– Grade B for Mediterranean-style dietary pattern, vegan or vegetarian dietary pattern, incorporation of dietary pulses (e.g. beans, peas, chick peas, lentils), and C for dietary approaches to stop hypertension dietary pattern – Education recommendation	Inclusion
52.An intensive lifestyle intervention program combining dietary modification and increased physical activity may be used to achieve weight loss and improvements in glycemic control and cardiovascular risk factors.	– Grade A – Lifestyle intervention	Inclusion
53.People with type 1 diabetes should be taught how to match insulin to carbohydrate quantity and quality or should maintain consistency in carbohydrate quantity and quality.	– Grade C and D – Pharmacological recommendation	Exclusion
54.People using insulin or insulin secretagogues should be informed of the risk of delayed hypoglycemia resulting from alcohol consumed with or after the previous evening's meal and should be advised on preventive actions such as carbohydrate intake and/or insulin dose adjustments and increased BG monitoring.	– Grade C and D – Pharmacological recommendation	Exclusion
55.To achieve glycemic targets in adults with type 1 diabetes, basal-bolus insulin regimens or CSII as part of an intensive diabetes management regimen should be used.	– Grade A – Pharmacological recommendation	Exclusion
56.Rapid-acting bolus insulin analogues, in combination with adequate basal insulin, should be used instead of regular insulin to minimize the occurrence of hypoglycemia, improve A1C and achieve postprandial glucose targets.	– Grade B – Pharmacological recommendation	Exclusion
57.Rapid-acting insulin analogues (aspart or lispro) should be used with CSII in adults with type 1 diabetes.	– Grade B – Pharmacological recommendation	Exclusion
58.A long-acting insulin analogue (detemir, glargine) may be used as the basal insulin to reduce the risk of hypoglycemia including nocturnal hypoglycemia.	– Grade B, C and D – Pharmacological recommendation – Hypoglycemia prevention	Exclusion
59.All individuals with type 1 diabetes should be counselled about the risk and prevention of insulin-induced hypoglycemia, and risk factors for severe hypoglycemia should be identified and addressed.	– Grade D – Pharmacological recommendation – Hypoglycemia prevention	Exclusion
60.In individuals with hypoglycemia unawareness, the following strategies may be used to reduce the risk of hypoglycemia and to attempt to regain hypoglycemia awareness: a. Increased frequency of SMBG, including periodic assessment during sleeping hours. b. Less stringent glycemic targets with avoidance of hypoglycemia for up to 3 months. c. A psychobehavioural intervention program (blood glucose awareness training).	– Grade C and D – Hypoglycemia prevention	Exclusion
61.In people with type 2 diabetes, if glycemic targets are not achieved using lifestyle management within 2 to 3 months, antihyperglycemic agent therapy should be initiated. Metformin may be used at the time of diagnosis, in conjunction with lifestyle management. i. If A1C > or = 8.5%, antihyperglycemic agents should be initiated concomitantly with lifestyle management, and consideration should be given to initiating	– Grade A and D – Pharmacological recommendation	Exclusion

combination therapy with 2 agents, one of which may be insulin. ii. Individuals with symptomatic hyperglycemia and metabolic decompensation should receive an initial antihyperglycemic regimen containing insulin.		
62.Metformin should be the initial drug used.	– Grade D – Pharmacological recommendation	Exclusion
63.Other classes of antihyperglycemic agents, including insulin, should be added to metformin, or used in combination with each other, if glycemic targets are not met, and these adjustments to and/or additions of antihyperglycemic agents should be made in order to attain target A1C within 3 to 6 months.	– Grade D – Pharmacological recommendation	Exclusion
64.Choice of pharmacological treatment agents should be individualized, taking into consideration: – Patient characteristics: • Degree of hyperglycemia, • Presence of comorbidities, • Patient preference and ability to access treatments. – Properties of the treatment: • Effectiveness and durability of lowering BG, • Risk of hypoglycemia, • Effectiveness in reducing diabetes complications, • Effect on body weight, • Side effects, • Contraindications.	– Grade D – Pharmacological recommendation	Exclusion
65.When basal insulin is added to antihyperglycemic agents, long-acting analogues (detemir or glargine) may be used instead of intermediate acting NPH to reduce the risk of nocturnal and symptomatic hypoglycemia.	– Grade A – Pharmacological recommendation	Exclusion
66.When bolus insulin is added to antihyperglycemic agents, rapid-acting analogues may be used instead of regular insulin to improve glycemic control and to reduce the risk of hypoglycemia.	– Grade B and D – Pharmacological recommendation	Exclusion
67.All individuals with type 2 diabetes currently using or starting therapy with insulin or insulin secretagogues should be counseled about the prevention, recognition and treatment of drug-induced hypoglycemia.	– Grade D – Pharmacological recommendation – Hypoglycemia treatment	Exclusion
68.Mild to moderate hypoglycemia should be treated by the oral ingestion of 15 g carbohydrate, preferably as glucose or sucrose tablets or solution. These are preferable to orange juice and glucose gels. Patients should retest BG in 15 minutes and re-treat with another 15 g carbohydrate if the BG level remains <4.0 mmol/L . Note: This does not apply to children	– Grade B and D – Hypoglycemia treatment	Exclusion
69.Severe hypoglycemia in a conscious person should be treated by oral ingestion of 20 g carbohydrate, preferably as glucose tablets or equivalent. BG should be retested in 15 minutes and then re-treated with another 15 g glucose if the BG level remains <4.0 mmol/L.	– Grade D – Hypoglycemia treatment	Exclusion
70.Severe hypoglycemia in an unconscious individual a. With no IV access: 1 mg glucagon should be given subcutaneously or intramuscularly. Caregivers or support persons should call for emergency services and the episode should be discussed with the diabetes healthcare team as soon as possible. b. With IV access: 10-25 g (20-50 cc of D50W) of glucose should be given intravenously over 1-3 minutes.	– Grade D – Hypoglycemia treatment	Exclusion
71.For individuals at risk of severe hypoglycemia, support persons should be taught how to administer glucagon by injection.	– Grade D – Hypoglycemia treatment	Exclusion
72.Once the hypoglycemia has been reversed, the person should have the usual meal or snack that is due at that time of the day to prevent repeated hypoglycemia. If a meal is >1 hour away, a snack (including 15 g carbohydrate and a protein source) should be consumed.	– Grade D – Hypoglycemia treatment	Exclusion
73.Patients receiving antihyperglycemic agents that may cause hypoglycemia should	– Grade D	Exclusion

be counselled about strategies for prevention, recognition and treatment of hypoglycemia related to driving and be made aware of provincial driving regulations.	– Hypoglycemia treatment and prevention	
74.In adult patients with Diabetic Kéto-Acidosis (DKA), a protocol should be followed that incorporates the following principles of treatment: 1) fluid resuscitation, 2) avoidance of hypokalemia, 3) insulin administration, 4) avoidance of rapidly falling serum osmolality, 5) search for precipitating cause.	– Grade D – Diabetic ketoacidosis treatment	Exclusion
75.In adult patients with Hyperosmolar Hyperglycemic State (HHS), a protocol should be followed that incorporates the following principles of treatment: 1) fluid resuscitation, 2) avoidance of hypokalemia, 3) avoidance of rapidly falling serum osmolality, 4) search for precipitating cause 5) possibly insulin to further reduce hyperglycemia	– Grade D – Hyperosmolar hyperglycemic State treatment	Exclusion
76.Point-of-care capillary beta-hydroxybutyrate may be measured in the hospital in patients with type 1 diabetes with capillary glucose >14.0 mmol/L to screen for DKA, and a beta-hydroxybutyrate >1.5 mmol/L warrants further testing for DKA.	– Grade B – Diagnostic of DKA recommendation	Exclusion
77.In individuals with DKA, IV 0.9% sodium chloride should be administered initially at 500 mL/h for 4 hours, then 250 mL/h for 4 hours with consideration of a higher initial rate (1e2 L/h) in the presence of shock. For persons with a HHS, IV fluid administration should be individualized based on the patient's needs.	– Grade B and D – Diabetic ketoacidosis treatment	Exclusion
78.In individuals with DKA, an infusion of short-acting IV insulin of 0.10 U/kg/h should be used. The insulin infusion rate should be maintained until the resolution of ketosis as measured by the normalization of the plasma anion gap. Once the plasma glucose concentration reaches 14.0 mmol/L, IV dextrose should be started to avoid hypoglycemia.	– Grade B and D – Diabetic ketoacidosis treatment	Exclusion
79.Provided that their medical conditions, dietary intake and glycemic control are acceptable, people with diabetes should be maintained on their prehospitalization oral antihyperglycemic agents or insulin regimens.	– Grade D – Pharmacological recommendation	Exclusion
80.For hospitalized patients with diabetes treated with insulin, a proactive approach that includes basal, bolus and correction (supplemental) insulin, along with pattern management, should be used to reduce adverse events and improve glycemic control, instead of the reactive sliding-scale insulin approach that uses only short- or rapid-acting insulin.	– Grade D – Pharmacological recommendation	Exclusion
81.For the majority of noncritically ill patients treated with insulin, preprandial BG targets should be 5.0 to 8.0 mmol/L in conjunction with random BG values <10.0 mmol/L, as long as these targets can be safely achieved.	– Grade D – Pharmacological recommendation	Exclusion
82.For most medical/surgical critically ill patients with hyperglycemia, a continuous IV insulin infusion should be used to maintain glucose levels between 8 and 10 mmol/L.	– Grade D – Pharmacological recommendation	Exclusion
83.To maintain intraoperative glycemic levels between 5.5 and 10.0 mmol/L for patients with diabetes undergoing CABG, a continuous IV insulin infusion protocol administered by trained staff should be used.	– Grade C – Pharmacological recommendation	Exclusion
84.Perioperative glycemic levels should be maintained between 5.0 and 10.0 mmol/L for most other surgical situations, with an appropriate protocol and trained staff to ensure the safe and effective implementation of therapy and to minimize the likelihood of hypoglycemia.	– Grade D – Pharmacological recommendation	Exclusion
85.In hospitalized patients, hypoglycemia should be avoided. – Protocols for hypoglycemia avoidance, recognition and management should be implemented with nurse-initiated treatment, including glucagon for severe hypoglycemia when IV access is not readily available. – Patients at risk of hypoglycemia should have ready access to an	– Grade D – Pharmacological recommendation	Exclusion

appropriate source of glucose (oral or IV) at all times, particularly when NPO or during diagnostic procedures.		
86.Healthcare professional education, insulin protocols and order sets may be used to improve adherence to optimal insulin use and glycemic control.	– Grade C – Pharmacological recommendation	Exclusion
87.Measures to assess, monitor and improve glycemic control within the inpatient setting should be implemented, as well as diabetes-specific discharge planning.	– Grade D – Pharmacological recommendation	Exclusion
88.An interdisciplinary weight management program (including a nutritionally balanced, calorie-restricted diet; regular physical activity; education; and counselling) for overweight and obese people with, or at risk for, diabetes should be implemented to prevent weight gain and to achieve and maintain a lower, healthy body weight.	– Grade A – Lifestyle recommendation	Inclusion
89.In overweight or obese adults with type 2 diabetes, the effect of antihyperglycemic agents on body weight should be taken into account.	– Grade D – Pharmacological recommendation	Exclusion
90.Adults with type 2 diabetes and class II or III obesity (BMI > or =35.0 kg/m2) may be considered for bariatric surgery when lifestyle interventions are inadequate in achieving healthy weight goals.	– Grade D – Surgical recommendation	Exclusion
91.Individuals with diabetes should be regularly screened for subclinical psychological distress and psychiatric disorders (e.g. depressive and anxiety disorders) by interview or with a standardized questionnaire	– Grade B – Diagnostic recommendation	Exclusion
92.Psychosocial interventions should be integrated into diabetes care plans, including – Motivational interventions, – Stress management strategies, – Coping skills training, – Family therapy, – Case management.	– Grade B and D – Psychological recommendation	Exclusion
93.Antidepressant medication should be used to treat acute depression and for maintenance treatment to prevent recurrence of depression. Cognitive behaviour therapy (CBT) alone or in combination with antidepressant medication may be used to treat depression in individuals with diabetes.	– Grade A and B – Pharmacological recommendation	Exclusion
94.Antipsychotic medications (especially atypical/second generation) can cause adverse metabolic changes. Regular metabolic monitoring is recommended for patients with and without diabetes who are treated with such medications.	– Grade A and D – Pharmacological recommendation	Exclusion
95.People with diabetes should receive an annual influenza immunization to reduce the risk of complications associated with influenza.	– Grade D – Pharmacological recommendation	Exclusion
96.Pneumococcal immunization should be offered to people with diabetes. A single dose is recommended for those >18 years of age. A 1-time revaccination is recommended for those >65 years of age (if the original vaccine was given when they were <65 years of age) with at least 5 years between administration.	– Grade D – Pharmacological recommendation	Exclusion
97.Individuals with type 1 diabetes and ESRD who are being considered for kidney transplantation should also be considered for simultaneous pancreas transplantation.	– Grade D – Surgical recommendation	Exclusion
98.Individuals with type 1 diabetes with preserved renal function, or who have undergone successful kidney transplantation but have persistent metabolic instability characterized by severe glycemic lability and/or severe hypoglycemia despite best efforts to optimize glycemic control, may be considered for pancreas or islet allotransplantation.	– Grade D – Surgical recommendation	Exclusion
99.Individuals undergoing total pancreatectomy for benign pancreatic disease may be considered for islet autotransplantation but only in the context of an experienced islet transplantation centre.	– Grade D – Surgical recommendation	Exclusion
100.Natural health products are not recommended for glycemic control for individuals with diabetes as there is insufficient evidence, at this time, regarding efficacy and safety.	– Grade D – Alternative medicine recommendation	Exclusion
101.Healthcare providers should ask about the use of natural health products.	– Grade D – Alternative medicine	Exclusion

	recommendation	
102.All individuals with diabetes (type 1 or type 2) should follow a comprehensive, multifaceted approach to reduce cardiovascular risk, including: – Achievement and maintenance of healthy body weight – Healthy diet – Regular physical activity – Smoking cessation – Optimal glycemic control (usually A1C < or =7%) – Optimal blood pressure control (<130/80 mm Hg) – Additional vascular protective medications in the majority of adult patients.	– Grade A for type 2 diabetes aged >40 years with microalbuminuria, grade D of the rest – Both lifestyle and pharmacological recommendation	Exclusion
103.Statin therapy should be used to reduce cardiovascular risk in adults with type 1 or type 2 diabetes with any of the following features: a. Clinical macrovascular disease b. Age > or =40 years c. Age <40 years and 1 of the following: – Diabetes duration >15 years and age >30 years – Microvascular complications – Warrants therapy based on the presence of other risk factors according to the 2012 Canadian Cardiovascular Society Guidelines for the Diagnosis and Treatment of Dyslipidemia.	– Grade A and D – Pharmacological recommendation	Exclusion
104.Angiotensin-Converting Enzyme (ACE) inhibitor or Angiotensin Receptor Blocker (ARB), at doses that have demonstrated vascular protection, should be used to reduce cardiovascular risk in adults with type 1 or type 2 diabetes with any of the following: a. Clinical macrovascular disease b. Age > or =55 years c. Age <55 years and microvascular complication	– Grade A and D – Pharmacological recommendation	Exclusion
105.Acetylsalicylic Acid (ASA) should not be routinely used for the primary prevention of cardiovascular disease in people with diabetes. ASA may be used in the presence of additional cardiovascular risk factors.	– Grade A and D – Pharmacological recommendation	Exclusion
106.Low-dose ASA therapy (81-325 mg) may be used for secondary prevention in people with established cardiovascular disease	– Grade D – Pharmacological recommendation	Exclusion
107.Clopidogrel 75 mg may be used in people unable to tolerate ASA.	– Grade D – Pharmacological recommendation	Exclusion
108.A baseline resting ECG should be performed in individuals with any of the following : – Age >40 years – Duration of diabetes >15 years and age >30 years – End organ damage (microvascular, macrovascular) – Cardiac risk factors	– Grade D – Diagnostic recommendation	Exclusion
109.A repeat resting ECG should be performed every 2 years in patients with diabetes.	– Grade D – Diagnostic recommendation	Exclusion
110.People with diabetes should undergo investigation for Coronary Artery Disease (CAD) by exercise ECG stress testing as the initial test in the presence of the following: – Typical or atypical cardiac symptoms (e.g. unexplained dyspnea, chest discomfort) – Signs or symptoms of associated diseases • Peripheral arterial disease (abnormal ankle-brachial index) • Carotid bruits • Transient ischemic attack • Stroke – Resting abnormalities on ECG (e.g. Q waves)	– Grade C and D – Diagnostic recommendation	Exclusion
111.Pharmacological stress echocardiography or nuclear imaging should be used in individuals with diabetes in whom resting ECG abnormalities preclude the use of exercise ECG stress testing (e.g. left bundle branch block or ST-T abnormalities). In addition, individuals who require stress testing and are unable to exercise should undergo pharmacological stress echocardiography or nuclear imaging.	– Grade D – Diagnostic recommendation	Exclusion
112.Individuals with diabetes who demonstrate ischemia at low exercise capacity (<5	– Grade D	Exclusion

metabolic equivalents [METs]) on stress testing should be referred to a cardiac specialist.	– Diagnostic recommendation	
113.A fasting (8-hour fast) lipid profile (TC, HDL-C, TG, and calculated LDL-C) or nonfasting lipid profile (apo B, non-HDL-C calculation) should be measured at the time of diagnosis of diabetes. If lipid-lowering treatment is not initiated, repeat testing is recommended yearly. More frequent testing (every 3-6 months) should be performed after treatment for dyslipidemia is initiated.	– Grade D – Diagnostic recommendation	Exclusion
114.For patients with indications for lipid-lowering therapy, treatment should be initiated with a statin, to achieve LDL-C < or =2.0 mmol/L.	– Grade C – Pharmacological recommendation	Exclusion
115.In patients achieving goal LDL-C with statin therapy, the routine addition of fibrates or niacin for the sole purpose of further reducing CV risk should not be used.	– Grade A – Pharmacological recommendation	Exclusion
116.For individuals not at LDL-C target despite statin therapy as described above, a combination of statin therapy with second-line agents may be used to achieve the LDL-C goal.	– Grade D – Pharmacological recommendation	Exclusion
117.For those who have serum TG >10.0 mmol/L, a fibrate should be used to reduce the risk of pancreatitis while also optimizing glycemic control and implementing lifestyle interventions (e.g. weight loss, optimal dietary strategies, reduction of alcohol).	– Grade D – Pharmacological recommendation	Exclusion
118.Persons with diabetes mellitus should be treated to attain Systolic Blood presseure (SBP) <130 mm Hg and Diastolic Blood Pressure (DBP) <80 mm Hg. (These target Blood Pressure (BP) levels are the same as the BP treatment thresholds). Combination therapy using 2 first-line agents may also be considered as initial treatment of hypertension if SBP is 20 mmHg above target or if DBP is 10 mm Hg above target. However, caution should be exercised in patients in whom a substantial fall in BP is more likely or poorly tolerated (e.g. elderly patients, patients with autonomic neuropathy).	– Grade C – Pharmacological recommendation	Exclusion
119.For persons with cardiovascular or kidney disease, including microalbuminuria, or with cardiovascular risk factors in addition to diabetes and hypertension, an ACE inhibitor or an ARB is recommended as initial therapy.	– Grade A – Pharmacological recommendation – Secondary prevention	Exclusion
120.For persons with diabetes and hypertension not included in the above recommendation, appropriate choices include (in alphabetical order): ACE inhibitors, ARBs, dihydropyridine Calcium Channel Blockers (CCB), and thiazide/thiazide-like diuretics.	– Grade A – Pharmacological recommendation	Exclusion
121.If target BP levels are not achieved with standard dose monotherapy, additional antihypertensive therapy should be used. For persons in whom combination therapy with an ACE inhibitor is being considered, a dihydropyridine CCB is preferable to hydrochlorothiazid.	– Grade A and D – Pharmacological recommendation	Exclusion
122.Patients with Acute Coronary Syndrom (ACS) should be screened for diabetes with a fasting blood glucose, A1C or 75 g OGTT prior to discharge from hospital.	– Grade D – Diagnostic recommendation	Exclusion
123.All patients with diabetes and ACS should receive the same treatments that are recommended for patients with ACS without diabetes since they benefit equally.	– Grade D – Pharmacological recommendation	Exclusion
124.Patients with diabetes and ACS undergoing Percutaneous Coronary Intervention (PCI) should receive antiplatelet therapy with prasugrel (if clopidogrel naïve, <75 years of age, weight >65 kg, and no history of stroke) or ticagrelor, rather than clopidogrel, to further reduce recurrent ischemic events. Patients with diabetes and non-STE ACS and higher risk features destined for a selective invasive strategy should receive ticagrelor rather than clopidogrel.	– Grade A and B – Pharmacological recommendation	Exclusion
125.Patients with diabetes and non-STE ACS and high-risk features should receive an early invasive strategy rather than a selective invasive approach to revascularization to reduce recurrent coronary events, unless contraindicated.	– Grade B – Surgical recommendation	Exclusion
126.In patients with diabetes and STE ACS, the presence of retinopathy should not be a contraindication to fibrinolysis.	– Grade B – Pharmacological recommendation	Exclusion
127.In-hospital management of diabetes in ACS should include strategies to avoid both hyperglycemia and hypoglycemia: – Blood glucose should be measured on admission and monitored throughout the hospitalization. – Patients with acute MI and blood glucose >11.0 mmol/L on admission may receive glycemic control in the range of 7.0 to 10.0 mmol/L, followed by strategies to achieve recommended glucose targets long term. Insulin	– Grade C and D – Pharmacological recommendation	Exclusion

therapy may be required to achieve these targets. A similar approach may be taken in those with diabetes and admission blood glucose < or =11.0 mmol/L. – An appropriate protocol should be developed and staff trained to ensure the safe and effective implementation of this therapy and to minimize the likelihood of hypoglycemia.		
128.Patients with ischemic stroke or transient ischemic attack (TIA) should be screened for diabetes with a fasting plasma glucose, A1C or 75 g oral glucose tolerance test soon after admission to hospital.	– Grade D – Diagnostic recommendation – Secondary prevention	Exclusion
129.All patients with diabetes and ischemic stroke or TIA should receive the same treatments that are recommended for patients with ischemic stroke or TIA without diabetes since they benefit equally.	– Grade D – Pharmacological recommendation – Secondary prevention	Exclusion
130.Individuals with diabetes and heart failure should receive the same heart failure therapies as those identified in the evidence-based Canadian Cardiovascular Society heart failure recommendations	– Grade D – Pharmacological recommendation – Secondary prevention	Exclusion
131.In people with diabetes and heart failure and an estimated glomerular filtration rate <60 mL/min, or if combined renin-angiotensin-aldosterone blockade is employed: – Starting doses of angiotensin-converting enzyme inhibitors or angiotensin receptor II antagonists (angiotensin receptor blockers) should be halved. – Serum electrolytes and creatinine, blood pressure and body weight, as well as heart failure symptoms and signs, should be monitored within 7-10 days of any initiation or titration of therapy. – Dose-up titration should be more gradual (with monitoring of blood pressure, serum potassium and creatinine). – The target drug doses should be the same as those identified in the evidence-based Canadian Cardiovascular Society recommendations on heart failure (http://www.ccsguidelineprograms.ca), if well tolerated.	– Grade D – Secondary prevention – Pharmacological recommendation	Exclusion
132.Beta blockers should be prescribed when indicated for systolic heart failure, as they provide similar benefits in people with diabetes compared with people without diabetes.	– Grade B – Secondary prevention – Pharmacological recommendation	Exclusion
133.In adults, screening for chronic kidney disease (CKD) in diabetes should be conducted using a random urine albumin-to-creatinin ratio(ACR) and a serum creatinine converted into an eGFR. Screening should commence at diagnosis of diabetes in individuals with type 2 diabetes and 5 years after diagnosis in adults with type 1 diabetes and repeated yearly thereafter. A diagnosis of CKD should be made in patients with a random urine ACR > or =2.0 mg/mmol and/or an eGFR<60 mL/min on at least 2 of 3 samples over a 3-month period.	– Grade D – Diagnostic recommendation	Exclusion
134.All patients with diabetes and CKD should receive a comprehensive, multifaceted approach to reduce cardiovascular risk.	– Grade A – Pharmacological recommendation	Exclusion
135.Adults with diabetes and CKD with either hypertension or albuminuria should receive an angiotensin-converting enzyme (ACE) inhibitor or an angiotensin 2 receptor block (ARB) to delay progression of CKD.	– Grade A and D – Pharmacological recommendation	Exclusion
136.People with diabetes on an ACE inhibitor or an ARB should have their serum creatinine and potassium levels checked at baseline and within 1 to 2 weeks of initiation or titration of therapy and during times of acute illness.	– Grade D – Diagnostic recommendation	Exclusion
137.Adults with diabetes and CKD should be given a “sick day” medication list that outlines which medications should be held during times of acute illness.	– Grade D – Pharmacological recommendation	Exclusion
138.Combination of agents that block the renin-angiotensin-aldosterone system (ACE inhibitor, ARB, direct renine inhibitor DRI) should not be routinely used in the management of diabetes and CKD.	– Grade A – Pharmacological recommendation	Exclusion
139.People with diabetes should be referred to a nephrologist or internist with an expertise in CKD in the following situations: a. Chronic, progressive loss of kidney function b. ACR persistently >60 mg/mmol c. eGFR<30 mL/min d. Unable to remain on renal-protective therapies due to adverse effects such as hyperkalemia or >30% increase in serum creatinine within 3 months of starting an ACE inhibitor or ARB	– Grade D – Follow-up of renal dysfunction recommendation	Exclusion

e. Unable to achieve target BP (could be referred to any specialist in hypertension).		
140.In individuals > or =15 years of age with type 1 diabetes, screening and evaluation for retinopathy by an expert professional should be performed annually starting 5 years after the onset of diabetes.	– Grade A – Diagnostic recommendation	Exclusion
141.In individuals with type 2 diabetes, screening and evaluation for diabetic retinopathy by an expert professional should be performed at the time of diagnosis of diabetes and annually thereafter. The interval for follow-up assessments should be tailored to the severity of the retinopathy. In those with no or minimal retinopathy, the recommended interval is 1-2 years.	– Grade A – Diagnostic of retinopathy recommendation	Exclusion
142.Screening for diabetic retinopathy should be performed by experienced professionals, either in person or through interpretation of retinal photographs taken through dilated pupils.	– Grade A – Diagnostic of retinopathy recommendation	Exclusion
143.To prevent the onset and delay the progression of diabetic retinopathy, people with diabetes should be treated to achieve optimal control of blood glucose and BP.	– Grade A – Retinopathy prevention recommendation	Exclusion
144.Though not recommended for CVD prevention or treatment, fenofibrate, in addition to statin therapy, may be used in patients with type 2 diabetes to slow the progression of established retinopathy.	– Grade A – Pharmacological recommendation	Exclusion
145.Patients with sight-threatening diabetic retinopathy should be assessed by a general ophthalmologist or retina specialist. Laser therapy and/or vitrectomy and/or pharmacological intervention should be used.	– Grade A – Diagnostic of retinopathy recommendation – Surgical and pharmacological recommendation	Exclusion
146.Visually disabled people should be referred for low-vision evaluation and rehabilitation.	– Grade D – Diagnostic of retinopathy recommendation	Exclusion
147.In people with type 2 diabetes, screening for peripheral neuropathy should begin at diagnosis of diabetes and occur annually thereafter. In people with type 1 diabetes, annual screening should commence after 5 years' postpubertal duration of diabetes.	– Grade D – Diagnostic of neuropathy recommendation	Exclusion
148.Screening for peripheral neuropathy should be conducted by assessing loss of sensitivity to the 10-g monofilament or loss of sensitivity to vibration at the dorsum of the great toe.	– Grade A – Diagnostic of neuropathy recommendation	Exclusion
149.People with diabetes should be treated with intensified glycemic control to prevent the onset and progression of neuropathy.	– Grade A and B – Neuropathy prevention recommendation	Exclusion
150.The following agents may be used alone or in combination for relief of painful peripheral neuropathy: a. Anticonvulsants (pregabalin, gabapentin,y valproatey). b. Antidepressants (amitriptyline,y duloxetine, venlafaxiney). c. Opioid analgesics (tapentadol ER, oxycodone ER, tramadol). d. Topical nitrate spray.	– Grade A and B – Pharmacological recommendation – Neuropathy treatment	Exclusion
151.In people with diabetes, foot examinations by healthcare providers should be an integral component of diabetes management to identify persons at risk for ulceration and lower-extremity amputation and should be performed at least annually and at more frequent intervals in those at high risk. Assessment by healthcare providers should include the assessment of skin changes, structural abnormalities (e.g. range of motion of ankles and toe joints, callus pattern, bony deformities), skin temperature, evaluation for neuropathy and PAD, ulcerations and evidence of infection.	– Grade C and D – Diabetes foot diagnostic recommendation	Exclusion
152.People at high risk of foot ulceration and amputation should receive foot care education (including counselling to avoid foot trauma), professionally fitted footwear and early referrals to a healthcare professional trained in foot care management if foot complications occur.	– Prevention of diabetes foot – Grade C	Exclusion
153.Individuals who develop a foot ulcer should be managed by a multidisciplinary healthcare team with expertise in the management of foot ulcers to prevent recurrent foot ulcers and amputation .	– Grade C – Prevention of diabetes foot	Exclusion
154.There is currently insufficient evidence to recommend any specific dressing type for diabetic foot ulcers. General principles of wound management involve the provision of a moist wound environment, debridement of nonviable tissue (nonischemic wounds) and offloading of pressure areas.	– Grade B and C – Prevention of diabetes foot	Exclusion
155.Evidence is currently lacking to support the routine use of adjunctive wound-healing therapies, such as topical growth factors, granulocyte colony-stimulating	– Grade D – Pharmacological	Exclusion

factors, dermal substitutes or HBOT in diabetic foot ulcers, but they may be considered in nonhealing, nonischemic wounds when all other options have been exhausted.	recommendation – Prevention of diabetes foot	
156.All adult men with diabetes should be regularly screened for erectile dysfunction (ED) with a sexual function history.	– Grade D – Concern erectile dysfunction recommendation	Exclusion
157.Men with diabetes and ED should be investigated for hypogonadism.	– Grade D – Concern erectile dysfunction recommendation	Exclusion
158.A PDE5 inhibitor, if there are no contraindications to its use, should be offered as first-line therapy to men with diabetes and ED in either an on-demand or scheduled-use dosing regimen.	– Grade A and B – Concern erectile dysfunction recommendation	Exclusion
159.Referral to a specialist in ED should be considered for eugonadal men who do not respond to PDE5 inhibitors or for whom the use of PDE5 inhibitors is contraindicated.	– Grade D – Concern erectile dysfunction recommendation	Exclusion
160.Men with diabetes and ejaculatory dysfunction who are interested in fertility should be referred to a healthcare professional experienced in the treatment of ejaculatory dysfunction.	– Grade D – Concern fertility	Exclusion
161.All children with diabetes should have access to an experienced pediatric diabetes healthcare (DHC) team and specialized care starting at diagnosis.	– Grade D – Population excluded – Diagnostic recommendation	Exclusion
162.Children with new-onset type 1 diabetes who are medically stable should receive their initial education and management in an outpatient setting, provided that appropriate personnel and daily communication with the DHC are available.	– Grade B – Type 1 diabetes education – Population excluded	Exclusion
163.To ensure ongoing and adequate diabetes care, adolescents should receive care from a specialized program aimed at creating a well prepared and supported transition to adult care that includes a transition coordinator, patient reminders, and support and education, with or without a joint pediatric and adult clinic.	– Grade C – Type 1 diabetes education – Population excluded	Exclusion
164.Glycemic targets should be graduated with age: – Children <6 years of age should aim for an A1C <8.0%. Caution should be used to minimize hypoglycemia because of the potential association in this age group between severe hypoglycemia and later cognitive impairment. – Children 6-12 years of age should aim for a target A1C< or =7.5%. – Adolescents should aim for the same glycemic targets as adults.	– Grade D and A for "adolescents should aim for the same glycemic targets as adults" – Education recommendation – Population excluded	Exclusion
165.Children with persistently poor glycemic control (e.g. A1C >10%) should be assessed by a specialized pediatric diabetes team for a comprehensive interdisciplinary assessment and referred for psychosocial support as indicated. Intensive family and individualized psychological interventions aimed at improving glycemic control should be considered to improve chronically poor metabolic control.	– Grade D, grade A for "intensive family and individualized psychological interventions aimed at improving glycemic control should be considered to improve chronically poor metabolic control." – Population excluded	Exclusion
166.Children with new-onset diabetes should be started on at least 2 daily injections of bolus insulin (e.g. short-acting bolus insulin or rapid-acting bolus insulin analogues) combined with basal insulin (e.g. intermediateacting insulin or long-acting basal insulin analogue).	– Grade D – Pharmacological recommendation – Population excluded	Exclusion
167.Insulin therapy should be assessed at each clinical encounter to ensure it still enables the child to meet A1C targets, minimizes the risk of hypoglycemia and allows flexibility in carbohydrate intake, daily schedule and activities. If these goals are not being met, an intensified diabetes management approach (including increased education, monitoring and contact with diabetes team) should be used, and treatment options may include the following: – Increased frequency of injections. – Change in the type of basal and/or bolus insulin, – Change to continuous subcutaneous insulin infusion therapy.	– Grade C and D – Pharmacological recommendation – Population excluded	Exclusion

168.In children, the use of mini-doses of glucagon (10 mg per year of age with minimum dose 20 mg and maximum dose 150 mg) should be considered in the home management of mild or impending hypoglycemia associated with inability or refusal to take oral carbohydrate.	– Grade D – Pharmacological recommendation – Population excluded	Exclusion
169.In the home situation, severe hypoglycemia in an unconscious child >5 years of age should be treated with 1 mg glucagon subcutaneously or intramuscularly. In children < or =5 years of age, a dose of 0.5 mg glucagon should be given. The episode should be discussed with the diabetes healthcare team as soon as possible and consideration given to reducing insulin doses for the next 24 hours to prevent further severe hypoglycemia.	– Grade D – Pharmacological recommendation – Population excluded	Exclusion
170.Dextrose 0.5-1 g/kg should be given over 1-3 minutes to treat severe hypoglycemia with unconsciousness when IV access is available.	– Grade D – Pharmacological recommendation – Population excluded	Exclusion
171.To prevent DKA in children with diabetes: – Targeted public awareness campaigns should be considered to educate parents and other caregivers (e.g. teachers) about the early symptoms of diabetes. – Comprehensive education and support services, as well as 24-hour telephone services, should be available for families of children with diabetes.	– Grade C – Population excluded – Concern DKA diagnosis, prevention or treatment	Exclusion
172.DKA in children should be treated according to pediatric-specific protocols. If appropriate expertise/facilities are not available locally, there should be immediate consultation with a centre with expertise in pediatric diabetes.	– Grade D – Population excluded – Concern DKA diagnosis, prevention or treatment	Exclusion
173.In children in DKA, rapid administration of hypotonic fluids should be avoided. Circulatory compromise should be treated with only enough isotonic fluids to correct circulatory inadequacy. Restoration of extracellular fluid volume should be extended over a 48-hour period with regular reassessments of fluid deficits.	– Grade D – Concern DKA diagnosis, prevention or treatment – Population excluded	Exclusion
174.In children in DKA, IV insulin bolus should not be given; an IV infusion of short-acting insulin should be used at an initial dose of 0.1 units/kg/h. The insulin infusion should not be started until 1 hour after starting fluid replacement therapy.	– Grade D – Concern DKA diagnosis, prevention or treatment – Population excluded	Exclusion
175.In children in DKA, the insulin infusion rate should be maintained until the plasma anion gap normalizes. Once plasma glucose reaches 14.0-17.0 mmol/L, IV glucose should be started to prevent hypoglycemia.	– Grade D – Concern DKA diagnosis, prevention or treatment – Population excluded	Exclusion
176.In children in DKA, administration of sodium bicarbonate should be avoided except in extreme circulatory compromise, as this may contribute to cerebral edema.	– Grade D – Concern DKA diagnosis, prevention or treatment – Population excluded	Exclusion
177.Screening for microalbuminuria should be performed annually, commencing at 12 years of age in children with type 1 diabetes >5 years' duration.	– Grade D – Concern renal dysfunction – Population excluded	Exclusion
178.Children > or =12 years should be screened for microalbuminuria with a first morning urine ACR (preferred) or a random ACR. Abnormal results should be confirmed at least 1 month later with a first morning ACR or timed, overnight urine collection for albumin excretion rate [Grade D, Consensus]. Microalbuminuria (ACR >2.5 mg/mmol) should not be diagnosed in children _12 years unless it is persistent, as demonstrated by 2 consecutive first morning ACR or timed collections obtained at 3- to 4-month intervals over a 6- to 12-month period.	– Grade B and D – Concern renal dysfunction – Population excluded	Exclusion
179.Children > or =12 years with persistent microalbuminuria should be treated per adult guidelines.	– Grade D – Concern renal dysfunction – Population excluded	Exclusion
180.In children > or =15 years of age with type 1 diabetes, screening and evaluation for retinopathy by an expert professional should be performed annually, starting 5 years after the onset of diabetes. The screening interval can be increased to every 2 years in children with type 1 diabetes who have good glycemic control, duration of diabetes <10 years and no significant retinopathy (as determined by an expert professional).	– Grade D – Retinopathy diagnosis, treatment or prevention – Population excluded	Exclusion
181.Postpubertal children with type 1 diabetes of >5 years' duration and poor metabolic control should be questioned about symptoms of numbness, pain, cramps and paresthesia, and examined for skin sensation, vibration sense, light touch and	– Grade D – Neuropathy diagnosis	Exclusion

ankle reflexes.	– Population excluded	
182.Children and adolescents with diabetes, along with their families, should be screened regularly for psychosocial or psychological disorders and should be referred to an expert in mental health and/or psychosocial issues for intervention when required.	– Grade D – Psychological prevention – Population excluded	Exclusion
183.Adolescent females with type 1 diabetes should be regularly screened using nonjudgemental questions about weight and body image concerns, dieting, binge eating and insulin omission for weight loss.	– Grade D – Psychological prevention – Population excluded	Exclusion
184.Children with type 1 diabetes who are <12 years of age should be screened for dyslipidemia if they have other risk factors, such as obesity (body mass index >95th percentile for age and gender) and/or a family history of dyslipidemia or premature cardiovascular disease. Routine screening for dyslipidemia should begin at 12 years of age, with repeat screening after 5 years.	– Grade D – Diagnostic recommendation – Population excluded	Exclusion
185.Once dyslipidemia is diagnosed in children with type 1 diabetes, the dyslipidemia should be treated per lipid guidelines for adults with diabetes.	– Grade D – Diagnostic recommendation – Population excluded	Exclusion
186.All children with type 1 diabetes should be screened for hypertension at least twice annually.	– Grade D – Diagnostic recommendation – Population excluded	Exclusion
187.Children with type 1 diabetes and BP readings persistently above the 95th percentile for age should receive lifestyle counselling, including weight loss if overweight. If BP remains elevated, treatment should be initiated based on recommendations for children without diabetes.	– Grade D – Diagnostic recommendation – Population excluded	Exclusion
188.Influenza immunization should be offered to children with diabetes as a way to prevent an intercurrent illness that could complicate diabetes management.	– Grade D – Pharmacological recommendation – Population excluded	Exclusion
189.Formal smoking prevention and cessation counselling should be part of diabetes management for children with diabetes.	– Grade D – Population excluded	Exclusion
190.Adolescent females with type 1 diabetes should receive counselling on contraception and sexual health in order to prevent unplanned pregnancy.	– Grade D – Population excluded	Exclusion
191.Children with type 1 diabetes who have thyroid antibodies should be considered high risk for autoimmune thyroid disease. Children with type 1 diabetes should be screened at diabetes diagnosis with repeat screening every 2 years using a serum thyroidstimulating hormone and thyroid peroxidase antibodies. More frequent screening is indicated in the presence of positive thyroid antibodies, thyroid symptoms or goiter.	– Grade C and D – Diagnostic recommendation – Population excluded	Exclusion
192.Children with type 1 diabetes and symptoms of classic or atypical celiac disease should undergo celiac screening and, if confirmed, be treated with a gluten-free diet to improve symptoms and prevent the long-term sequelae of untreated classic celiac disease. Parents should be informed that the need for screening and treatment of asymptomatic (silent) celiac disease is controversial.	– Grade D – Diagnostic recommendation – Population excluded	Exclusion
193.Anticipatory guidance promoting healthy eating, maintenance of a healthy weight and regular physical activity is recommended as part of routine pediatric care.	– Grade D – Population excluded	Exclusion
194.Intensive lifestyle intervention, including dietary and exercise interventions, family counselling and family-oriented behaviour therapy, should be undertaken for obese children in order to achieve and maintain a healthy body weight.	– Grade D – Population excluded	Exclusion
195.Screening for type 2 diabetes should be performed every 2 years using an fasting plasma glucose (FPG) test in children with any of the following: – >or= 3 risk factors in nonpubertal or > or =2 risk factors in pubertal children • Obesity (BMI > or =95th percentile for age and gender) • Member of a high-risk ethnic group (e.g. Aboriginal, African, Asian, Hispanic or South Asian descent) • Family history of type 2 diabetes and/or exposure to hyperglycemia in utero • Signs or symptoms of insulin resistance (including acanthosis nigricans, hypertension, dyslipidemia, NAFLD [ALT >3X upper limit of normal or fatty liver on ultrasound], PCOS). – Impaired fasting glucose or impaired glucose tolerance. – Use of atypical antipsychotic medications.	– Grade D – Population excluded	Exclusion
196.An oral glucose tolerance test (1.75 g/kg; maximum 75 g) may be used as a screening test in very obese children (BMI > or=99th percentile for age and gender)	– Grade D	Exclusion

or those with multiple risk factors who meet the criteria in recommendation 3.	– Population excluded – Diagnostic recommendation	
197.Commencing at the time of diagnosis of type 2 diabetes, all children should receive ongoing intensive counselling, including lifestyle modification, from an interdisciplinary pediatric healthcare team.	– Grade D – Population excluded	Exclusion
198.The target A1C for most children with type 2 diabetes should be < or =7.0%.	– Grade D – Population excluded	Exclusion
199.In children with type 2 diabetes and A1C > or =9.0% and in those with severe metabolic decompensation (e.g. DKA), insulin therapy should be initiated but may be successfully weaned once glycemic targets are achieved, particularly if lifestyle changes are effectively adopted.	– Grade D – Population excluded	Exclusion
200.In children with type 2 diabetes, if glycemic targets are not achieved within 3-6 months using lifestyle modifications alone, one of the following should be initiated: – Metformin OR – Glimepiride OR – Insulin. If the decision is made to use an oral antihyperglycemic agent, metformin should be used over glimepiride [Grad. Metformin may be used at diagnosis in those children presenting with A1C >7.0%.	– Grade B and D – Population excluded – Pharmacological recommendation	Exclusion
201.Children with type 2 diabetes should be screened annually for microvascular complications (nephropathy, neuropathy, retinopathy) beginning at diagnosis of diabetes.	– Grade D – Population excluded – Diagnostic recommendation	Exclusion
202.Children with type 2 diabetes should be screened for microalbuminuria with a first morning urine ACR (preferred) or a random ACR. Abnormal results should be confirmed at least 1 month later with a first morning ACR and, if abnormal, followed by timed, overnight urine collection for albumin excretion rate. Microalbuminuria [ACR > 2.5 mg/mmol] should not be diagnosed in adolescents unless it is persistent as demonstrated by 2 consecutive first morning ACR or timed collections obtained at 3- to 4-month intervals over a 6- to 12-month period. Those with persistent albuminuria should be referred to a pediatric nephrologist for assessment of etiology and treatment .	– Grade B and D – Population excluded – Diagnostic recommendation	Exclusion
203.Children with type 2 diabetes should have a fasting lipid profile measured at diagnosis of diabetes and every 1-3 years thereafter, as clinically indicated.	– Grade D – Population excluded – Diagnostic recommendation	Exclusion
204.Children with type 2 diabetes should be screened for hypertension beginning at diagnosis of diabetes and at every diabetes-related clinical encounter thereafter (at least biannually).	– Grade D – Population excluded – Diagnostic recommendation	Exclusion
205.Children with type 2 diabetes should be screened at diagnosis for comorbid conditions associated with insulin resistance, including nonalcoholic fatty liver disease (NAFLD) and polycystic ovary syndrome (PCOS) in pubertal females, and yearly thereafter as clinically indicated.	– Grade D – Population excluded	Exclusion
206.All women of reproductive age with type 1 or type 2 diabetes should receive advice on reliable birth control, the importance of glycemic control prior to pregnancy, the impact of BMI on pregnancy outcomes, the need for folic acid and the need to stop potentially embryopathic drugs prior to pregnancy.	– Grade D – Population excluded – Concern pregnancy	Exclusion
207.Women with type 2 diabetes and irregular menses/PCOS who are started on metformin or a thiazolidinedione should be advised that fertility may improve and be warned about possible pregnancy .	– Grade D – Population excluded – Concern fertility and pregnancy	Exclusion
208.Before attempting to become pregnant, women with type 1 or type 2 diabetes should: a. Receive preconception counselling that includes optimal diabetes management and nutrition, preferably in consultation with an interdisciplinary pregnancy team to optimize maternal and neonatal outcomes. b. Strive to attain a preconception A1C < or =7.0% (or A1C as close to normal as can safely be achieved) to decrease the risk of: • Spontaneous abortion. • Congenital anomalies. • Preeclampsia. • Progression of retinopathy in pregnancy.	– Grade C and D – Population excluded – Concern fertility and pregnancy	Exclusion

c. Supplement their diet with multivitamins containing 5 mg folic acid at least 3 months preconception and continuing until at least 12 weeks postconception. Supplementation should continue with a multivitamin containing 0.4-1.0 mg folic acid from 12 weeks postconception to 6 weeks postpartum or as long as breastfeeding continues. d. Discontinue medications that are potentially embryopathic, including any from the following classes: • ACE inhibitors and ARBs prior to conception or upon detection of pregnancy. • Statins.		
209.Women with type 2 diabetes who are planning a pregnancy should switch from noninsulin antihyperglycemic agents to insulin for glycemic control. Women with pregestational diabetes who also have PCOS may continue metformin for ovulation induction.	– Grade D – Population excluded – Concern fertility and pregnancy	Exclusion
210.Women should undergo an ophthalmological evaluation by an eye care specialist.	– Grade A for type 1 diabetes, D for type 2 – Population excluded – Concern fertility and pregnancy	Exclusion
211.Women should be screened for chronic kidney disease prior to pregnancy. Women with microalbuminuria or overt nephropathy are at increased risk for development of hypertension and preeclampsia and should be followed closely for these conditions.	– Grade A and D – Population excluded – Concern fertility and pregnancy	Exclusion
212.Pregnant women with type 1 or type 2 diabetes should: a. Receive an individualized insulin regimen and glycemic targets typically using intensive insulin therapy. b. Strive for target glucose values: • Fasting PG <5.3 mmol/L • 1-hour postprandial <7.8 mmol/L • 2-hour postprandial <6.7 mmol/L c. Be prepared to raise these targets if needed because of the increased risk of severe hypoglycemia during pregnancy. d. Perform SMBG, both pre- and postprandially, to achieve glycemic targets and improve pregnancy outcomes.	– Grade A, C and D – Population excluded – Concern fertility and pregnancy	Exclusion
213.Women with pregestational diabetes may use aspart or lispro in pregnancy instead of regular insulin to improve glycemic control and reduce hypoglycemia .	– Grade C – Population excluded – Concern fertility and pregnancy	Exclusion
214.Detemir or glargine may be used in women with pregestational diabetes as an alternative to NPH.	– Grade C – Population excluded – Concern fertility and pregnancy	Exclusion
215.Women should be closely monitored during labour and delivery, and maternal blood glucose levels should be kept between 4.0 and 7.0 mmol/L in order to minimize the risk of neonatal hypoglycemia .	– Grade D – Population excluded – Concern fertility and pregnancy	Exclusion
216.Women should receive adequate glucose during labour in order to meet their high-energy requirements .	– Grade D – Population excluded – Concern fertility and pregnancy	Exclusion
217.Women with pregestational diabetes should be carefully monitored postpartum as they have a high risk of hypoglycemia.	– Grade D – Population excluded – Concern fertility and pregnancy	Exclusion
218.Metformin and glyburide may be used during breastfeeding.	– Grade C and D – Population excluded – Concern fertility and pregnancy	Exclusion

219.Women with type 1 diabetes in pregnancy should be screened for postpartum thyroiditis with a TSH test at 6-8 weeks postpartum	– Grade D – Population excluded – Concern fertility and pregnancy	Exclusion
220.All women should be encouraged to breastfeed since this may reduce offspring obesity, especially in the setting of maternal obesity.	– Grade C – Population excluded – Concern fertility and pregnancy	Exclusion
221.All pregnant women should be screened for gestational diabetes mellitus (GDM) at 24-28 weeks of gestation.	– Grade C – Population excluded – Concern fertility and pregnancy	Exclusion
222.If there is a high risk of GDM based on multiple clinical factors, screening should be offered at any stage in the pregnancy. If the initial screening is performed before 24 weeks of gestation and is negative, rescreen between 24 and 28 weeks of gestation. Risk factors include: • Previous diagnosis of GDM • Prediabetes • Member of a high-risk population (Aboriginal, Hispanic, South Asian, Asian, African) • Age > OR =35 years • BMI > or =30 kg/m2 • Polycystic ovarian syndrome (PCOS), acanthosis nigricans • Corticosteroid use • History of macrosomic infant • Current fetal macrosomia or polyhydramnios.	– Grade D – Population excluded – Concern fertility and pregnancy	Exclusion
223.The preferred approach for the screening and diagnosis of GDM is the following : a. Screening for GDM should be conducted using the 50 g Glucose Challenge Test (GCT) administered in the nonfasting state with PG glucose measured 1 hour later. PG > or =7.8 mmol/L at 1 hour will be considered a positive screen and will be an indication to proceed to the 75 g OGTT. PG > or =11.1 mmol/L can be considered diagnostic of gestational diabetes and does not require a 75 g OGTT for confirmation. b. If the GCT screen is positive, a 75 g OGTT should be performed as the diagnostic test for GDM using the following criteria: – > or =1 of the following values: • Fasting > or =5.3 mmol/L. • 1 hour > or =10.6 mmol/L. • 2 hours > or =9.0 mmol/L.	– Grade C et B – Population excluded – Concern fertility and pregnancy	Exclusion
224.An alternative approach that may be used to screen and diagnose GDM is the 1-step approach: a. A 75 g OGTT should be performed (with no prior screening 50 g GCT) as the diagnostic test for GDM using the following criteria: – > or = 1 of the following values: • Fasting > or =5.1 mmol/L. • 1 hour > or =10.0 mmol/L. • 2 hours > or = 8.5 mmol/L.	– Grade B and D – Population excluded – Concern fertility and pregnancy	Exclusion
225.Women with GDM should: a. Strive for target glucose values: • Fasting PG <5.3 mmol/L. • 1-hour postprandial <7.8 mmol/L. • 2-hour postprandial <6.7 mmol/L. b. Perform SMBG, both fasting and postprandially, to achieve glycemic targets and improve pregnancy outcomes. c. Avoid ketosis during pregnancy.	– Grade B and C – Population excluded – Concern fertility and pregnancy	Exclusion
226.Receive nutrition counselling from a registered dietitian during pregnancy and postpartum. Recommendations for weight gain during pregnancy should be based on pregravid BMI.	– Grade C and D – population excluded – Concern fertility and pregnancy	Exclusion
227.If women with GDM do not achieve glycemic targets within 2 weeks from nutritional therapy alone, insulin therapy should be initiated.	– Grade D – Population excluded – Concern fertility and pregnancy	Exclusion

228.Insulin therapy in the form of multiple injections should be used.	– Grade A – Population excluded – Concern fertility and pregnancy	Exclusion
229.Rapid-acting bolus analogue insulin may be used over regular insulin for postprandial glucose control, although perinatal outcomes are similar.	– Grade B – Population excluded – Concern fertility and pregnancy	Exclusion
230.For women who are nonadherent to or who refuse insulin, glyburide or metformin may be used as alternative agents for glycemic control. Use of oral agents in pregnancy is off-label and should be discussed with the patient.	– Grade B and D – Population excluded – Concern fertility and pregnancy	Exclusion
231.Women should be closely monitored during labour and delivery, and maternal blood glucose levels should be kept between 4.0 and 7.0 mmol/L in order to minimize the risk of neonatal hypoglycemia.	– Grade D – Population excluded – Concern fertility and pregnancy	Exclusion
232.Women should receive adequate glucose during labour in order to meet their high-energy requirements.	– Grade D – Population excluded – Concern fertility and pregnancy	Exclusion
233.Women with GDM should be encouraged to breastfeed immediately after delivery in order to avoid neonatal hypoglycemia and to continue for at least 3 months postpartum in order to prevent childhood obesity and reduce risk of maternal hyperglycemia.	– Grade C and D – Population excluded – Concern fertility and pregnancy	Exclusion
234.Women should be screened with a 75 g OGTT between 6 weeks and 6 months postpartum to detect prediabetes and diabetes.	– Grade D – Population excluded – Concern fertility and pregnancy	Exclusion
235.Healthy elderly people with diabetes should be treated to achieve the same glycemic, blood pressure and lipid targets as younger people with diabetes.	– Grade D – Population excluded – Treatments objectives	Exclusion
236.In the frail elderly, while avoiding symptomatic hyperglycemia, glycemic targets should be A1C < or =8.5% and fasting plasma glucose or preprandial PG 5.0-12.0 mmol/L, depending on the level of frailty. Prevention of hypoglycemia should take priority over attainment of glycemic targets because the risks of hypoglycemia are magnified in this patient population.	– Grade D – Treatments objectives – Population excluded	Exclusion
237.In elderly people with cognitive impairment, strategies should be used to strictly prevent hypoglycemia, which include the choice of antihyperglycemic therapy and less stringent A1C target.	– Grade D – Population excluded – Pharmacological recommendation	Exclusion
238.Elderly people with type 2 diabetes should perform aerobic exercise and/or resistance training, if not contraindicated, to improve glycemic control.	– Grade D – Population excluded – Lifestyle recommendation	Exclusion
239.In elderly people with type 2 diabetes, sulphonylureas should be used with caution because the risk of hypoglycemia increases exponentially with age. • In general, initial doses of sulphonylureas in the elderly should be half of those used for younger people, and doses should be increased more slowly. • Gliclazide and gliclazide MR and glimepiride should be used instead of glyburide, as they are associated with a reduced frequency of hypoglycemic events. • Meglitinides may be used instead of glyburide to reduce the risk of hypoglycemia, particularly in patients with irregular eating habits.	– Grade C and D (B for Gliclazide and gliclazide MR use) – Pharmacological recommendation – Population excluded	Exclusion
240.In elderly people, thiazolidinediones should be used with caution due to the increased risk of fractures and heart failure.	– Grade D – Population excluded – Pharmacological recommendation	Exclusion
241.Detemir and glargine may be used instead of NPH or human 30/70 insulin to lower the frequency of hypoglycemic events.	– Grade B – Pharmacological recommendation	Exclusion
242.In elderly people, if insulin mixture is required, premixed insulins and prefilled	– Grade B	Exclusion

insulin pens should be used instead of mixing insulins to reduce dosing errors and to potentially improve glycemic control.	– Pharmacological recommendation – Population excluded	
243.The clock drawing test may be used to predict which elderly subjects will have difficulty learning to inject insulin.	– Grade D – Population excluded – Pharmacological recommendation	Exclusion
244.In elderly nursing home residents, regular diets may be used instead of "diabetic diets" or nutritional formulas.	– Grade D – Population excluded – Lifestyle recommendation	Exclusion
245.Starting in early childhood, Aboriginal people should be evaluated for modifiable risk factors of diabetes (e.g. obesity, lack of physical activity, unhealthy eating habits), prediabetes, or metabolic syndrome.	– Grade D – Population excluded	Exclusion
246.Screening for diabetes in Aboriginal children and adults should follow guidelines for high risk populations (i.e. earlier and at more frequent intervals depending on presence of additional risk factors).	– Grade D – Population excluded	Exclusion
247.Culturally appropriate primary prevention programs for children and adults should be initiated in and by Aboriginal communities with support from the relevant health system(s) and agencies to assess and mitigate the environmental risk factors, such as: • geographic and cultural barriers • food insecurity • psychological stress • insufficient infrastructure • settings that are not conducive to physical activity.	– Grade D – Population excluded	Exclusion
248.Management of prediabetes and diabetes in Aboriginal peoples should follow the same clinical practice guidelines as those for the general population with respect for, and sensitivity to, particular language, cultural history, traditional beliefs and medicines, and geographic issues as they relate to diabetes care and education in Aboriginal communities across Canada. Programs should adopt a holistic approach to health that addresses a broad range of stressors shared by Aboriginal people.	– Grade D – Population excluded	Exclusion
249.Aboriginal peoples in Canada should have access in their communities to a diabetes management program that would include an interprofessional nurse-led team, diabetes registries, and ongoing quality assurance and surveillance programs.	– Grade D – Population excluded	Exclusion
250.Aboriginal women should attempt to reach a healthy body weight prior to conception to reduce their risk for gestational diabetes.	– Grade D – Population excluded	Exclusion
251.Programs to detect pre-gestational and gestational diabetes, provide optimal management of diabetes in pregnancy, and timely post-partum follow-up should be instituted for all Aboriginal women to improve perinatal outcomes, manage persistent maternal dysglycemia, and reduce type 2 diabetes rates in their children.	– Grade D – Population excluded	Exclusion

7.1 Appendix F: matrix part of "Canadian Diabetes Association, Clinical practice guidelines for the prevention and management of diabetes in Canada, 2013".

Recommendation	References	Survey type	Intervention: yes/no	Intervention description	Inclusion/exclusion
11.The following quality improvement strategies should be used, alone or in combination, to improve glycemic control: a) Promotion of self-management b) Team changes c) Disease (case) management d) Patient education e) Facilitated relay of clinical information f) Electronic patient registries g) Patient reminders h) Audit and feedback i) Clinician education j) Clinician reminders (with or without decision support)	1.Tricco AC, Ivers NM, Grimshaw JM, et al. Effectiveness of quality improvement strategies on the management of diabetes: a systematic review and meta-analysis. Lancet; 2012:12-21.	Meta-analysis of RCT	Yes	48 cluster-randomised trials and 94 patient-randomised trials, 20 companion reports.Quality improvement strategies reduced HbA_{1c} by a mean difference of 0,37% (95% CI 0,28–0,45; 120 trials), LDL cholesterol by 0,10 mmol/L (0,05–0,14; 47 trials), systolic blood pressure by 3,13 mm Hg (2,19–4,06; 65 trials), and diastolic blood pressure by 1,55 mm Hg (0,95–2,15; 61 trials) versus usual care	Inclusion
15.Telehealth technologies may be used as part of a disease management program to: 1. Improve self-management in underserviced communities. 2. Facilitate consultation with specialized teams as part of a shared-care model.	2.Davis RM, Hitch AD, Salaam MM. TeleHealth improves diabetes self-management in an underserved community: Diabetes TeleCare. Diabetes Care 2010;33:1712-7.	RCT	Yes	Significant reduction in glycated hemoglobin (GHb) in the Diabetes TeleCare group from baseline to 6 and 12 months (9.4 ± 0.3, 8.3 ± 0.3, and 8.2 ± 0.4, respectively) compared with usual care (8.8 ± 0.3, 8.6 ± 0.3, and 8.6 ± 0.3, respectively).	Inclusion
	3.Verhoeven F, Tanja-Dijkstra K, Nijland N, et al. Asynchronous and synchronous teleconsultation for diabetes care: a systematic literature review. J Diabetes Sci Technol 2010;4:666-84.	Systematic review of RCT, observational studies and quasi-experimental studies	Both	90 studies. Reported improvements concerned clinical values (n = 49), self-care (n = 46), and satisfaction with technology (n = 43). Minority of studies demonstrated improvements in patient-caregiver interactions (n = 28) and cost reductions (n = 27). Few studies reported enhanced quality of life (n = 12), transparency of health care (n = 7), and improved equity in care delivery (n = 4).	Inclusion
16.People with diabetes should be offered timely diabetes education that is tailored to enhance self-care practices and behaviours.	4.Minet L, Moller S, Lach V, et al. Mediating the effect of self-care management intervention in type 2 diabetes: a meta-analysis of 47 randomised controlled trials. Patient Educ Couns 2010;80:29-41.	Meta-analysis of RCT	Yes	47 RCT. Showed a 0.36% (95% CI 0.21–0.51) improvement in glycemic control in people who received self-care management treatment. In the univariate meta-regression sample size (effect size 0.42%, p = 0.007) and follow-up period (effect size 0.49%, p = 0.017) were identified to have significant effect on the effect size in favour of small studies and short follow-up	Inclusion

	5.Ellis S, Speroff T, Dittus R, et al. Diabetes patient education: a meta analysis and meta-regression. Patient Educ Couns 2004;52:97-105.	Meta-analysis of RCT	Yes	21 RCT. 28 education interventions. Patient education improves glycemic control in patients with diabetes. The HbA_{1c} net change was 0.32	Inclusion
	6.Norris SL, Engelgau MM, Narayan KMV. Effectiveness of self-management training in type 2 diabetes: a systematic review of randomized controlled trials. Diabetes Care 2001;24:561-87.	Meta-analysis of RCT	Yes	72 studies. Positive effects of self-management training on knowledge, frequency and accuracy of self-monitoring of blood glucose, self-reported dietary habits, and glycemic control were demonstrated in studies with short follow-up (<6 months). Effects of interventions on lipids, physical activity, weight, and blood pressure were variable	Inclusion
17.All people with diabetes who are able should be taught how to self-manage their diabetes	7.Norris SL, Engelgau MM, Narayan KMV. Effectiveness of self-management training in type 2 diabetes: a systematic review of randomized controlled trials. Diabetes Care 2001;24:561-87.				Duplicate
18.Self-Management Education (SME) that incorporates cognitive-behavioural educational interventions, such as problem solving, goal setting, and self-monitoring of health parameters, should be implemented for all individuals with diabetes.	8.Ellis S, Speroff T, Dittus R, et al. Diabetes patient education: a meta analysis and meta-regression. Patient Educ Couns 2004;52:97-105.				Duplicate
	9.Kulzer B, Hermanns N, Reinhecker H, et al. Effects of self-management training in type 2 diabetes: a randomized prospective trial. Diabetic Med 2007;24: 415-23.	RCT	Yes	181 type 2 diabetic patients. Didactic-oriented training programme (treatment A) was compared with a self-management-oriented programme delivered in group sessions (treatment B). The latter programme was compared with a more individualized approach (treatment C). The fall in HbA_{1c} in treatment B at t1 was sustained at t2 (t0 8.1 ± 1.8%, t1 7.3 ± 1.7%, t2 7.4 ± 1.9%). In treatment A, HbA_{1c} was unchanged throughout (t0 7.6 ± 1.5%, t1 7.5 ± 1.3%, t2 7.7 ± 1.7%; treatment A vs. treatment B; $P < 0.05$). With the more individualized approach of treatment C, there was a fall in HbA_{1c} at t1, but this was not sustained at t2 (t0 7.8 ± 1.6%, t1 7.1 ± 1.3%, t2 7.6 ± 1.6%; treatment B vs. treatment C; $P = 0.73$).	Inclusion
	10.Weinger K, Beverly E, Lee Y, et al. The effect of a structured behavioral intervention in poorly controlled diabetes. Arch Intern Med 2011;171:1990-8.	RCT	Yes	222 patients with diabetes. 3-arm trial parallel. Linear mixed modeling found that all groups showed improved HbA_{1c} levels ($P < .001$). However, the structured behavioral arm showed greater improvements than the group and individual control arms (3-month HbA_{1c} concentration changes: −0.8% vs −0.4% and −0.4%, respectively ($P = .04$ for group time interaction). Furthermore, participants with type 2	Inclusion

				disease showed greater improvement than those with type 1 (*P* = .04 for type of diabetes time interaction)	
	11.Steed L, Cooke D, Newman S. A systematic review of psychosocial outcomes following education, self-management and psychological interventions in diabetes mellitus. Patient Educ Couns 2003;51:5-15	Systematic review of RCT	Yes	36 studies. Intervention type was defined as education (EDUC), self-management (SM) or psychological (PSYCH). Detrimental effects were not generally seen following any type of intervention. Depression seemed to be particularly improved following psychological interventions, whilst quality of life improved more following self-management interventions	Inclusion
19.Interventions that increase patient participation and collaboration in healthcare decision making should be used by providers.	12.Norris SL, Engelgau MM, Narayan KMV. Effectiveness of self-management training in type 2 diabetes: a systematic review of randomized controlled trials. Diabetes Care 2001;24:561-87.				Duplicate
20.For people with type 2 diabetes, SME interventions should be offered in small group and/or one-on-one settings, since both may be effective.	13.Rickheim PL, Weaver TW, Flader JL, et al. Assessment of group versus individual diabetes education: a randomized study. Diabetes Care 2002;25:269-74.	RCT	Yes	170 subjects with type 2 diabetes. HbA1c decreased from 8.5 +/- 1.8% at baseline to 6.5 +/- 0.8% at 6 months (P < 0.01) in the study population. Subjects assigned to the individual setting had 1.7 +/- 1.9% reduction in HbA1c (P < 0.01), whereas subjects assigned to group setting had 2.5 +/- 1.8% reduction in HbA1c (P < 0.01). Difference in HbA1c improvement marginally greater in subjects assigned to group education versus individualized education (P = 0.05).	Inclusion
	14.Deakin T, McShane CE, Cade JE, et al. Group based training for self-management strategies in people with type 2 diabetes mellitus. Cochrane Database System Rev 2005;2:CD003417.	Systematic review of RCT or controlled clinical trial (CCT)	Yes	11 studies. In primary and secondary care. Diabetes education programmes reduced glycated hemoglobin at four to six months (1.4%; 95% confidence interval (CI) 0.8 to 1.9; P < 0.00001), at 12-14 months (0.8%; 95% CI 0.7 to 1.0; P < 0.00001) and two years (1.0%; 95% CI 0.5 to 1.4; P < 0.00001); reduced fasting blood glucose levels at 12 months (1.2 mmol/L; 95% CI 0.7 to 1.6; P < 0.00001); reduced body weight at 12-14 months (1.6 Kg; 95% CI 0.3 to 3.0; P = 0.02); improved diabetes knowledge at 12-14 months (SMD 1.0; 95% CI 0.7 to 1.2; P < 0.00001) and reduced systolic blood pressure at four to six months (5 mmHg: 95% CI 1 to 10; P = 0.01). There was also a reduced need for diabetes medication (odds ratio 11.8, 95% CI 5.2 to 26.9; P < 0.00001; RD = 0.2; NNT = 5).	Inclusion

21.In both type 1 and 2 diabetes, interventions that target families' ability to cope with stress or diabetes-related conflict should be included in educational interventions when indicated.	15.Armour TA, Norris SL, Jack Jr L, et al. The effectiveness of family interventions in people with diabetes mellitus: a systematic review.Diabet Med 2005;22:1295-305.	Systematic review of RCT	Yes	19 studies. Concern type 1 and 2 diabetic patients, including children	Exclusion
37.People with diabetes should accumulate a minimum of 150 minutes of moderate- to vigorous-intensity aerobic exercise each week, spread over at least 3 days of the week, with no more than 2 consecutive days without exercise.	16.Chudyk A, Petrella RJ. Effects of exercise on cardiovascular risk factors in type 2 diabetes: a meta-analysis. Diabetes Care 2011;34:1228e37	SR of RCT	yes	34 articles. Aerobic alone or combined with resistance training (RT) significantly improved HbA(1c) -0.6 and -0.67%, respectively (95% CI -0.98 to -0.27 and -0.93 to -0.40, respectively), systolic blood pressure (SBP) -6.08 and -3.59 mmHg, respectively (95% CI -10.79 to -1.36 and -6.93 to -0.24, respectively), and triglycerides -0.3 mmol/L (95% CI -0.48 to -0.11 and -0.57 to -0.02, respectively).	Inclusion
	17.Snowling NJ, Hopkins WG. Effects of different modes of exercise training on glucose control and risk factors for complications in type 2 diabetic patients: a meta-analysis. Diabetes Care 2006;29:2518e27.	Meta-analysis of RCT	Yes	27 RCT. For training lasting >/=12 weeks, the overall effect was a small beneficial reduction (A1C 0.8 +/- 0.3% [mean +/- 90% confidence limit]). There were generally small to moderate benefits for other measures of glucose control	Inclusion
	18.Umpierre D, Ribeiro PA, Kramer CK, et al. Physical activity advice only or structured exercise training and association with HbA1c levels in type 2 diabetes: a systematic review and meta-analysis. JAMA 2011;305:1790e9.	Systematic review and meta-analysis of RCT	Yes	47 trials. Structured exercise training associated with a decline in HbA1c level (-0.67%; 95% confidence interval [CI], -0.84% to -0.49%; I(2), 91.3%). Structured aerobic exercise (-0.73%; 95% CI, -1.06% to -0.40%; I(2), 92.8%), structured resistance training (-0.57%; 95% CI, -1.14% to -0.01%; I(2), 92.5%), and both combined (-0.51%; 95% CI, -0.79% to -0.23%; I(2), 67.5%) were each associated with declines in HbA(1C) levels. Structured exercise durations of more than 150 minutes per week associated with HbA1c reductions of 0.89%, while structured exercise durations of 150 minutes or less per week were associated with HbA1C reductions of 0.36%. Interventions of physical activity advice associated with lower HbA1c levels (-0.43%; 95% CI, -0.59% to -0.28%; I(2), 62.9%). Combined physical activity advice and dietary advice associated with decreased HbA1c (-0.58%; 95% CI, -0.74% to -0.43%; I(2), 57.5%). Physical activity advice alone not associated with HbA1c changes.	Inclusion

38.People with diabetes (including elderly people) should perform resistance exercise at least twice a week and preferably 3 times per week in addition to aerobic exercise.	19.Balducci S, Zanuso S, Nicolucci A, et al. Effect of an intensive exercise intervention strategy on modifiable cardiovascular risk factors in subjects with type 2 diabetes mellitus: a randomized controlled trial: the Italian Diabetes and Exercise Study (IDES). Arch Intern Med 2010;170:1794e803.	RCT	Yes	606 patients. The mean (SD) volume of PA (metabolic equivalent hours per week) significantly higher (P < .001) in exercise (total PA [nonsupervised conditioning PA + supervised PA], 20.0 [0.9], and nonsupervised, 12.4 [7.4]) vs control (10.0 [8.7]) group. Compared with the control group, supervised exercise produced significant improvements (mean difference [95% confidence interval]) in physical fitness; HbA(1c) level (-0.30% [-0.49% to -0.10%]; P < .001); systolic (-4.2 mm Hg [-6.9 to -1.6 mm Hg]; P = .002) and diastolic (-1.7 mm Hg [-3.3 to -1.1 mm Hg]; P = .03) blood pressure; high-density lipoprotein (3.7 mg/dL [2.2 to 5.3 mg/dL]; P < .001) and low-density lipoprotein (-9.6 mg/dL [-15.9 to -3.3 mg/dL]; P = .003) cholesterol level; waist circumference (-3.6 cm [-4.4 to -2.9 cm]; P < .001); body mass index; insulin resistance; inflammation; and risk scores.	Inclusion
	20.Gordon BA, Benson AC, Bird SR, Fraser SF. Resistance training improves metabolic health in type 2 diabetes: a systematic review. Diabetes Res Clin Pract 2009;83:157e75.	Systematic review of RCT, non-RCT and uncontrolled trial	Both	Supervised RT improved glycemic control and insulin sensitivity, however, when supervision was removed compliance and glycemic control decreased	Inclusion
	21.Church TS, Blair SN, Cocreham S, et al. Effects of aerobic and resistance training on hemoglobin A1c levels in patients with type 2 diabetes: a randomized controlled trial. JAMA 2010;304:2253e62.	RCT	Yes	262 sedentary men and women. Compared with the control group, the absolute mean change in HbA_{1c} in the combination training exercise group was −0.34% (95% confidence interval "CI", −0.64% to −0.03%; *P*=.03).	Inclusion
	22.Sigal RJ, Kenny GP, Boule NG, et al. Effects of aerobic training, resistance training, or both on glycemic control in type 2 diabetes: a randomized trial. Ann Intern Med 2007;147:357e69.	RCT	Yes	Either aerobic or resistance training alone improves glycemic control in type 2 diabetes, but the improvements are greatest with combined aerobic and resistance training	Inclusion
39.People with diabetes should set specific physical activity goals, anticipate likely barriers to physical activity (e.g. weather, competing commitments), develop strategies to overcome these barriers and keep records of their physical activity.	23.Lin JS, O'Connor E, Whitlock EP, Beil TL. Behavioral counseling to promote physical activity and a healthful diet to prevent cardiovascular disease in adults: a systematic review for the U.S. Preventive Services Task Force. Ann Intern Med 2010;153:736-50.	Systematic review of long-term observational follow-up	No.	73 studies. Intensive sodium reduction counseling: decrease in the incidence of CVD. High-intensity dietary counseling, with or without physical activity counseling, resulted in changes of -0.3 to -0.7 kg/m(2) in body mass index (adiposity), -1.5 mm Hg (95% CI, -0.9 to -2.1 mm Hg) in systolic blood pressure, -0.7 mm Hg (CI, -0.6 to -0.9 mm Hg) in diastolic pressure, -0.17 mmol/L (CI, -0.09 to -0.25 mmol/L) (-6.56 mg/dL [CI, -3.47 to -9.65 mg/dL]) in total cholesterol level, and -0.13 mmol/L (CI, -0.06 to	Exclusion

				-0.21 mmol/L) (-5.02 mg/dL [CI, -2.32 to -8.11 mg/dL]) in low-density lipoprotein cholesterol level. Medium- and high-intensity counseling resulted in moderate to large changes in self-reported dietary and physical activity behaviors.	
	24.DeWalt DA, Davis TC, Wallace AS, et al. Goal setting in diabetes self-management: taking the baby steps to success. Patient Educ Couns 2009;77:218-23.	Quasi-experimental study using a one group pretest-posttest method	Yes	250 patients with type 2 diabetes. Goal setting. Majority of participants reported achieving and sustaining their behavioral goals at each follow-up session, however, only one-third (33%) reported achieving and sustaining their goals at all 3 follow-up sessions. 7% of subjects did not achieve any goals set during the study, and 73% of patients achieved and sustained at least 2 behavioral goals.	Inclusion
40.Structured exercise programs supervised by qualified trainers should be implemented when feasible for people with type 2 diabetes to improve glycemic control, CVD risk factors and physical fitness.	25.Umpierre D, Ribeiro PA, Kramer CK, et al. Physical activity advice only or structured exercise training and association with HbA1c levels in type 2 diabetes: a systematic review and meta-analysis. JAMA 2011;305:1790-9.				Duplicate
	26.Balducci S, Zanuso S, Nicolucci A, et al. Effect of an intensive exercise intervention strategy on modifiable cardiovascular risk factors in subjects with type 2 diabetes mellitus: a randomized controlled trial: the Italian Diabetes and Exercise Study (IDES). Arch Intern Med 2010;170:1794-803.				Duplicate
42.People with diabetes should receive nutrition counselling by a registered dietitian to lower A1C levels and to reduce hospitalization rates.	27.Franz MJ, Monk A, Barry B, et al. Effectiveness of medical nutrition therapy provided by dietitians in the management of non-insulin-dependent diabetes mellitus: a randomized, controlled clinical trial. J Am Diet Assoc 1995;95:1009e17.	RCT	Yes	At 6 months, PGC resulted in significant improvements in blood glucose control as indicated by FPG and HbA1c levels and BC resulted in significant improvements in HbA1c level. Participants assigned to the PGC group had a mean FPG level at 6 months that was 10.5% lower than the level at entry, and those in the BC group had a 5.3% lower value.	Inclusion
43.Nutrition education is effective when delivered in either a small group or a one-on-one setting. Group education should incorporate adult education principles, such as hands-on activities, problem solving, role playing and group discussions.	28.Rickheim PL, Weaver TW, Flader JL, et al. Assessment of group versus individual diabetes education: a randomized study. Diabetes Care 2002;25:269-74.				Duplicate
	29.Trento M, Basile M, Borgo E, et al. A randomised controlled clinical trial of nurse-, dietitian- and pedagogist-led Group Care for the management of type 2 diabetes. J Endocrinol Invest 2008;31:1038-42.	RCT		Not completely available for free	Exclusion

45.In overweight or obese people with diabetes, a nutritionally balanced, calorie-reduced diet should be followed to achieve and maintain a lower, healthier body weight.	30.Knowler WC, Barrett-Connor E, Fowler SE, et al, Diabetes Prevention Program Research Group. Reduction in the incidence of type 2 diabetes with lifestyle intervention or metformin. N Engl J Med 2002;346:393-403.	RCT	Yes	3234 nondiabetic participants. Lifestyle intervention vs Metformin vs placebo. Incidence of diabetes was 11.0, 7.8, and 4.8 cases per 100 person-years in the placebo, metformin, and lifestyle groups, respectively.	Inclusion
	31.Look AHEAD Research GroupWing RR. Long-term effects of a lifestyle intervention on weight and cardiovascular risk factors in individuals with type 2 diabetes mellitus: four-year results of the Look AHEAD trial. Arch Intern Med 2010;170:1566-75.	RCT	Yes	Intensive Lifestyle Intervention (ILI) participants: greater percentage of weight loss than Diabetes Support and Education (DSE) participants (-6.15% vs -0.88%; P < .001) and greater improvements in treadmill fitness (12.74% vs 1.96%; P < .001), HbA1c level (-0.36% vs -0.09%; P < .001), systolic (-5.33 vs -2.97 mm Hg; P < .001) and diastolic (-2.92 vs -2.48 mm Hg; P = .01) blood pressure, and levels of high-density lipoprotein cholesterol (3.67 vs 1.97 mg/dL; P < .001) and triglycerides (-25.56 vs -19.75 mg/dL; P < .001). Reductions in low-density lipoprotein cholesterol levels greater in DSE than ILI participants (-11.27 vs -12.84 mg/dL; P = .009) owing to greater use of medications to lower lipid levels in the DSE group. At 4 years, ILI participants maintained greater improvements than DSE participants in weight, fitness, HbA1c levels, systolic blood pressure, and high-density lipoprotein cholesterol levels.	Inclusion
50.Dietary advice may emphasize choosing carbohydrate food sources with a low glycemic index to help optimize glycemic control.	32.Barnard ND, Cohen J, Jenkins DJ, et al. A low-fat vegan diet improves glycemic control and cardiovascular risk factors in a randomized clinical trial in individuals with type 2 diabetes. Diabetes Care 2006;29:1777-83.	RCT	Yes	99 participants. Low-fat vegan diet or a diet following the American Diabetes Association (ADA) guidelines. 43% (21 of 49) of the vegan group and 26% (13 of 50) of the ADA group participants reduced diabetes medications. HbA1c decreased 0.96 percentage points in the vegan group and 0.56 points in the ADA group (P = 0.089). Excluding those who changed medications, A1C fell 1.23 points in the vegan group compared with 0.38 points in the ADA group (P = 0.01). Body weight decreased 6.5 kg in vegan group and 3.1 kg in ADA group (P < 0.001). Body weight change correlated with A1C change (r = 0.51, n = 57, P < 0.0001). Among those who did not change lipid-lowering medications, LDL cholesterol fell 21.2% in the vegan group and 10.7% in the ADA group (P =	Inclusion

				0.02). After adjustment for baseline values, urinary albumin reductions were greater in the vegan group (15.9 mg/24 h) than in the ADA group (10.9 mg/24 h) (P = 0.013).	
	33.Jenkins DJ, Wolever TM, Taylor RH, et al. Glycemic index of foods: a physiological basis for carbohydrate exchange. Am J Clin Nutr 1981;34: 362-6.	Cohort interventional study	Yes	34 healthy nondiabetic volunteers. Largest rises of blood glucose were seen with vegetables (70 +/- 5%), followed by breakfast cereals (65 +/- 5%), cereals and biscuits (60 +/- 3%), fruit (50 +/- 5%), dairy products (35 +/- 1%), and dried legumes (31 +/- 3%). A significant negative relationship was seen between fat (p less than 0.01) and protein (p less than 0.001) and postprandial glucose rise but not with fiber or sugar content.	Inclusion
	34.Ahmed AT, Karter AJ, Warton M, et al. The relationship between alcohol consumption and glycemic control among patients with diabetes: the Kaiser Permanente Northern California Diabetes Registry. J Gen Intern Med 2008;23:275-82.	Follow-up survey	No	A1C values were 8.88 (lifetime abstainers), 8.79 (former drinkers), 8.90 (<0.1 drink/day), 8.71 (0.1-0.9 drink/day), 8.51 (1-1.9 drinks/day), 8.39 (2-2.9 drinks/day), and 8.47 (>/=3 drinks/day). Alcohol consumption was linearly (p < 0.001) and inversely (p = 0.001) associated with A1C among diabetes patients.	Exclusion
	35.Jenkins DJ, Kendall CW, McKeown-Eyssen G, et al. Effect of a low-glycemic index or a high-cereal fiber diet on type 2 diabetes: a randomized trial. JAMA 2008;300:2742-53	RCT	Yes	210 participants with oral medication. Low–glycemic index diet vs a high–cereal fiber diet. HbA1c decreased by -0.18% absolute HbA1c units (95% confidence interval [CI], -0.29% to -0.07%) in the high-cereal fiber diet compared with -0.50% absolute HbA(1c) units (95% CI, -0.61% to -0.39%) in the low-glycemic index diet (P < .001). Increase of high-density lipoprotein cholesterol in the low-glycemic index diet by 1.7 mg/dL (95% CI, 0.8-2.6 mg/dL) compared with a decrease of high-density lipoprotein cholesterol by -0.2 mg/dL (95% CI, -0.9 to 0.5 mg/dL) in the high-cereal fiber diet (P = .005). Reduction in dietary glycemic index related positively to the reduction in HbA(1c) concentration (r = 0.35, P < .001) and negatively to the increase in high-density lipoprotein cholesterol (r = -0.19, P = .009).	Inclusion
51.Alternative dietary patterns may be used in people with type 2 diabetes to improve glycemic control, (including): a. Mediterranean-style dietary pattern,	36.Esposito K, Maiorino MI, Ceriello A, et al. Prevention and control of type 2 diabetes by Mediterranean diet: a systematic review. Diabetes Res Clin Pract 2010;89:97e102.	SR of prospective cohort and RCT	Yes	Improvement of fasting glucose and HbA1c levels was greater with a Mediterranean diet and ranged from 7 to 40 mg/dl for fasting glucose,	Inclusion

b. Vegan or vegetarian dietary pattern, c. Incorporation of dietary pulses (e.g. beans, peas, chick peas, lentils) d. Dietary Approaches to Stop Hypertension (DASH) dietary pattern.				and from 0.1 to 0.6% for HbA1c.	
	37.Barnard ND, Cohen J, Jenkins DJA, et al. A low-fat vegan diet and a conventional diabetes diet in the treatment of type 2 diabetes: a randomized, controlled, 74-wk clinical trial. Am J Clin Nutr 2009;89:1588Se96S.	RCT	Yes	Weight loss was significant within each diet group but not significantly different between groups (-4.4 kg in the vegan group and -3.0 kg in the conventional diet group, P = 0.25) and related significantly to Hb A(1c) changes (r = 0.50, P = 0.001). Hb A(1c) changes from baseline to 74 wk or last available values were -0.34 and -0.14 for vegan and conventional diets, respectively (P = 0.43).	Inclusion
	38.Kahleova H, Matoulek M, Malinska H, et al. Vegetarian diet improves insulin resistance and oxidative stress markers more than conventional diet in subjects with Type 2 diabetes. Diabet Med 2011;28:549e59.	RCT	Yes	Forty-three per cent of participants in the experimental group and 5% of participants in the control group reduced diabetes medication (P < 0.001). Body weight decreased more in the experimental group than in the control group [-6.2 kg (95% CI -6.6 to -5.3) vs. -3.2 kg (95% CI -3.7 to -2.5); interaction group × time P = 0.001].	Inclusion
	39.Sievenpiper JL, Kendall CWC, Esfahani A, et al. Effect of non-oil-seed pulses on glycaemic control: a systematic review and meta-analysis of randomized controlled experimental trials in people with and without diabetes. Diabetologia 2009;52:1479e95.	Systematic review and meta-analysis of RCT	Yes	41 trials. Pulses alone (11 trials) lowered fasting blood glucose (FBG) (-0.82, 95% CI -1.36 to -0.27) and insulin (-0.49, 95% CI -0.93 to -0.04). Pulses in low-GI diets (19 trials) lowered glycosylated blood proteins (GP), measured as HbA(1c) or fructosamine (-0.28, 95% CI -0.42 to -0.14). Finally, pulses in high-fibre diets (11 trials) lowered FBG (-0.32, 95% CI -0.49 to -0.15) and GP (-0.27, 95% CI -0.45 to -0.09).	Inclusion
52.An intensive lifestyle intervention program combining dietary modification and increased physical activity may be used to achieve weight loss and improvements in glycemic control and cardiovascular risk factors.	40.Look AHEAD Research GroupWing RR. Long-term effects of a lifestyle intervention on weight and cardiovascular risk factors in individuals with type 2 diabetes mellitus: four-year results of the Look AHEAD trial. Arch Intern Med 2010;170:1566-75.				Duplicate
88.An interdisciplinary weight management program (including a nutritionally balanced, calorie-restricted diet; regular physical activity; education; and counselling) for overweight and obese people with, or at	41.Look AHEAD Research GroupWing RR. Long-term effects of a lifestyle intervention on weight and cardiovascular risk factors in individuals with type 2 diabetes mellitus: four-year results of the Look AHEAD trial. Arch Intern Med 2010;170:1566-75.				Duplicate

risk for, diabetes should be implemented to prevent weight gain and to achieve and maintain a lower, healthy body weight.	42.Diabetes Program Prevention Research Group. Reduction in the incidence of Type 2 diabetes with lifestyle or metformin. N Engl J Med 2002;346:393-403.				Duplicate

SERMENT D’HIPPOCRATE

Au moment d'être admise à exercer la médecine, je promets et je jure d'être fidèle aux lois de l'honneur et de la probité.

Mon premier souci sera de rétablir, de préserver ou de promouvoir la santé dans tous ses éléments, physiques et mentaux, individuels et sociaux.

Je respecterai toutes les personnes, leur autonomie et leur volonté, sans aucune discrimination selon leur état ou leurs convictions. J'interviendrai pour les protéger si elles sont affaiblies, vulnérables ou menacées dans leur intégrité ou leur dignité. Même sous la contrainte, je ne ferai pas usage de mes connaissances contre les lois de l'humanité.

J'informerai les patients des décisions envisagées, de leurs raisons et de leurs conséquences. Je ne tromperai jamais leur confiance et n'exploiterai pas le pouvoir hérité des circonstances pour forcer les consciences.

Je donnerai mes soins à l'indigent et à quiconque me le demandera. Je ne me laisserai pas influencer par la soif du gain ou la recherche de la gloire.

Admise dans l'intimité des personnes, je tairai les secrets qui me seront confiés. Reçue à l'intérieur des maisons, je respecterai les secrets des foyers et ma conduite ne servira pas à corrompre les mœurs.

Je ferai tout pour soulager les souffrances. Je ne prolongerai pas abusivement les agonies. Je ne provoquerai jamais la mort délibérément.

Je préserverai l'indépendance nécessaire à l'accomplissement de ma mission. Je n'entreprendrai rien qui dépasse mes compétences. Je les entretiendrai et les perfectionnerai pour assurer au mieux les services qui me seront demandés.

J'apporterai mon aide à mes confrères ainsi qu'à leurs familles dans l'adversité.

Que les hommes et mes confrères m'accordent leur estime si je suis fidèle à mes promesses ; que je sois déshonorée et méprisée si j'y manque. »

Serment d’Hippocrate prononcé le 11/04/2019 par Christelle Le Gaffric

FACULTÉ
DE MÉDECINE &
SCIENCES DE LA SANTÉ

IMPRIME 4 – AUTORISATION D'IMPRIMER

THESE DE DOCTORAT EN MEDECINE

INTERNE

Madame Le Gaffric Christelle
Inscrite en DES de médecine générale

Titre définitif de la thèse soutenue :

Projet SPICES :
-Sélection, parmi sept recommandations de bonne pratique pour la prévention des maladies cardiovasculaires, via les procédures Agree II et ADAPTE.
-Identification des références bibliographiques des recommandations internationales « National Stroke Foundation, Guidelines for the management of absolute cardiovascular disease risk, 2012 » et « Canadian Diabetes Association, Clinical practice guidelines for the prevention and management of diabetes in Canada, 2013 », à intégrer dans la matrice de recherche de l'étude SPICES.

ACCORD DU PRESIDENT DU JURY DE THESE SUR L'IMPRESSION DE LA THESE

OUI : ☐

La présente autorisation d'imprimer sa thèse est délivrée à l'interne susmentionné.

Brest, le 23/03/2019

Le président du jury de thèse

LE RESTE Jean-Yves

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Le directeur de l'UFR de médecine et des sciences de la santé de Brest

C. BERTHOU

LE GAFFRIC (Christelle) – Projet SPICES :

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119 pages, 3 figures, 6 tableaux

Th. : Méd. : Brest 2019

Résumé

Introduction :

Les maladies cardiovasculaires (MCV) sont la première cause de décès dans le monde. Leurs facteurs de risque sont connus et une prévention primaire est possible. Cependant, les principales stratégies actuelles sont axées sur les médicaments et l'accès médical n'est pas suffisant, particulièrement dans les pays à faible revenus. Des changements sont nécessaires. SPICES visait à mettre en œuvre, à l'échelle locale, des recommandations non-pharmacologiques concernant la prévention cardiovasculaire (CV) primaire. Une revue systématique de la littérature pour une mise en œuvre fut réalisée. La méthode ADAPTE et son outil AGREE 2 ont permis une sélection d'interventions de prévention efficaces parmi les meilleures recommandations de bonne pratique (RBP) internationales.

Méthode :

Sept RBP ont été analysées avec l'outil AGREE 2. Les RBP avec une évaluation générale égale ou supérieure à 5 ont été sélectionnées. Ensuite, les recommandations avec un niveau de preuve de A ou B concernant la prévention CV primaire non-pharmacologique dans les collectivités ont été extraites des 2 RBP retenues. Les références de ces recommandations ont été recueillies dans une matrice si elles appartenaient à des études à haut niveau de preuve (revue systématique de la littérature, essai contrôlé randomisé, étude de cohorte) avec un résultat positif.

Résultats :

Parmi les sept RBP, six ont été retenues. 53 références ont été sélectionnées sur 22 recommandations.

Discussion :

Une revue exhaustive de la littérature internationale sur la prévention CV primaire et une extraction de leurs références ont été accomplies à travers SPICES. Le choix de la méthode ADAPTE était originale. ADAPTE différait de la méthode PRISMA mais était plus adaptée à notre objectif de mise en œuvre. Les biais d'information et de sélection ont été limités au maximum grâce aux consensus trouvés entre les membres du projet SPICES et à l'utilisation de RBP de haut niveau de preuve.

MOTS CLES :

CARDIOVASCULAR DISEASES ; PRIMARY PREVENTION ; CLINICAL PRACTICE GUIDELINE

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