UK National Screening Committee

Population screening for Type 2 diabetes in adults

An evidence map to outline the potential benefits of population screening for Type 2 diabetes for the UK National Screening Committee

Version: Final version

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The UK National Screening Committee secretariat is hosted by the Department of Health and Social Care

Contents

About the UK National Screening Committee (UK NSC)

The UK NSC advises ministers and the NHS in the 4 UK countries about all aspects of population screening and supports implementation of screening programmes.

Conditions are reviewed against evidence review criteria according to the UK NSC's evidence review process.

Read a complete list of UK NSC recommendations.

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www.gov.uk/uknsc

Blog: https://nationalscreening.blog.gov.uk/

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Summary

This document discusses the findings of the evidence map on population screening for Type 2 diabetes in adults.

Evidence maps are a way of scanning published literature to look at the volume and type of evidence in relation to a specific topic. They inform whether the evidence is sufficient to commission a more sustained analysis on the topic under consideration.

Based on the findings of this evidence map no further evidence synthesis work should be commissioned at the present time.

The UK National Screening Committee (UK NSC) will return to investigate if population screening for Type 2 diabetes is suggested in 3-years' time.

Introduction and approach

Background and objectives

The UK National Screening Committee (UK NSC) external reviews (also known as evidence summaries or evidence reviews) are developed in keeping with the UK NSC evidence review process to ensure that each topic is addressed in the most appropriate and proportionate manner. Further information on the evidence review process can be accessed online.

Type 2 diabetes mellitus (T2DM) is a chronic condition that is characterised by relative insulin deficiency and insulin resistance in target organs.[1] It is most often diagnosed in adults but an increasing prevalence is seen in children and adolescents. T2DM accounts for more than 95% of patients with diabetes and approximately 537 million cases of diabetes worldwide. In T2DM, the symptoms can be mild. Some of the symptoms include feeling very thirsty, needing to urinate more often, blurred vision, feeling tired, and losing weight unintentionally. Over time diabetes can damage blood vessels in the heart, eyes, kidneys and nerves.[2] T2DM leads to microvascular and macrovascular complications that cause distress to both patients and cares and also put a huge burden on the health-care system.

Diabetes is one of the most common chronic diseases in the UK, and its prevalence is increasing: registration figures from 2021-2022 from Diabetes UK show that more than 4.3 million people in the UK live with diabetes and additionally, 850,000 people could be living with diabetes who are yet to be diagnosed.[3] Worth noting is also the state known as impaired glucose tolerance (IGT), where blood glucose levels are higher than normal but not yet at diabetic level. People with IGT are at an increased risk of cardiovascular disease (CVD) and of developing diabetes.

Although there is increasing knowledge regarding risk factor and prevention programmes, the incidence and prevalence of the disease is rising on a global level.[1] Early diagnosis is important to prevent the worst effects..

Treatment for T2DM is aimed at minimising the risk of long-term microvascular and macrovascular complications. Treatment thus focuses on reducing blood glucose levels, as well as tackling the increased cardiovascular risk, high cholesterol levels and/or high blood pressure that often come with a diagnosis of type 2 diabetes.

Lifestyle changes including weight loss, healthy diet (i.e. low intake of fats, sugars and alcohol), smoking cessation and regular exercise are recommended to reduce hyperglycaemia and cardiovascular risk.[4] Antidiabetic drugs can be prescribed to boost lifestyle interventions, when these changes alone are not adequate to control blood glucose levels. When indicated, patients can be prescribed insulin with a structured support programme covering dose titration, injection techniques, self-monitoring, and knowledge of dietary effects and glucose control.[4]

In relation to test accuracy, the most frequently studied diabetes tests have advantages and disadvantages. HbA1c testing is accepted for diagnosis in people who are suspected to have diabetes, with a level of ≥6.5%, but it is less reliable for screening because of its low sensitivity and the need to be confirmed by a second test, such as a second HbA1c, a fasting plasma glucose (FPG) or an oral glucose tolerance test (OGTT). The OGTT has higher sensitivity but it is inconvenient and time-consuming; it requires fasting overnight, and acceptance may be poor. The FPG lacks sensitivity though it has greater specificity than the HbA1c.[5] Despite some limitations, the HbA1c test is considered to be convenient and it continues to be used routinely to diagnose and/or to check that diabetes in under control.

In addition, the 2013 review recommended that further research be conducted into the usefulness of the 50-g glucose challenge test (GCT) as a screening test.[6] The 50-g GCT does not require fasting; it has been used extensively in screening for gestational diabetes and it appears to be a promising screening tool but overall, the evidence base is sparse.[5]

The current evidence map has been developed to assess whether further work on screening for Type 2 diabetes in adults is justified.

Previous review on T2DM screening

The last UK National Screening Committee (NSC) review, published in 2019, concluded that there is no evidence to support whole population screening for T2DM in adults in the UK.[6] Based on the findings from the above review, it was decided that a rapid review on screening is not necessary and therefore suggested that an evidence map should be developed at a later stage.

The 2019 UK NSC evidence summary found some evidence that FPG, 2-hour postload plasma glucose (2-hour PG), and HbA1c levels are associated with all-cause mortality and micro- and macrovascular complications of diabetes such as retinopathy and nephropathy. There was no consistent evidence that any one glycaemic marker (FPG, 2-hour PG, HbA1c) is better at predicting these outcomes. There was considerable variability between the included studies in terms of sample characteristics and blood glucose thresholds examined. No studies were found that examined the predictive value of the 50 g glucose challenge test (50 g GCT) compared to FPG, 2-hour PG, or HbA1c.[6]

The current evidence map was developed in order to access whether further work on population screening for T2DM is justified.

Aims of the evidence map

Evidence maps are rapid evidence products which aim to gauge the volume and type of evidence relating to a specific topic.

The aim was to address the following research question:

1. Is there enough evidence from randomised controlled trials demonstrating the benefits of population screening for type 2 diabetes?

The findings of this evidence map will provide the basis for discussion to support decision making on whether there is sufficient evidence to justify commissioning a more sustained review of the evidence on the population screening for type 2 diabetes.

The aim of this document is to present the information necessary to inform UK NSC decision making processes.

Search methods

In order to gauge the volume and type of evidence a focused search of the following key resources was conducted on 19 August 2025:

- MEDLINE and Epub Ahead of Print, In-Process, In-Data-Review & Other Non-Indexed Citations, Daily and Versions (Ovid): 1946 to August 18, 2025
- Embase (Ovid): 1974 - 2025 August 14
- Cochrane Database of Systematic Reviews: Issue 8 of 12, August 2025
- Cochrane Central Register of Controlled Trials: Issue 7 of 12, July 2025
- KSR Evidence: to 19.8.25
- Trip Database: to 19.8.25
- HTA Database: to 19.8.25
- NICE Guidance: to 19.8.25

The search strategies used relevant search terms, comprising a combination of indexed key-words (e.g., from medical subject headings and the Embase thesaurus EMTREE) and free-text terms appearing in the titles and/or abstracts of database records. Searches were limited by date to identify references published since the searches conducted in 2018 and by language to identify only references published in English. Conference proceedings were excluded where possible.

Full strategies for all searches conducted are provided in Appendix 1 as well as the tables out-lining the specific Inclusion/Exclusion criteria used.

Handling of citations

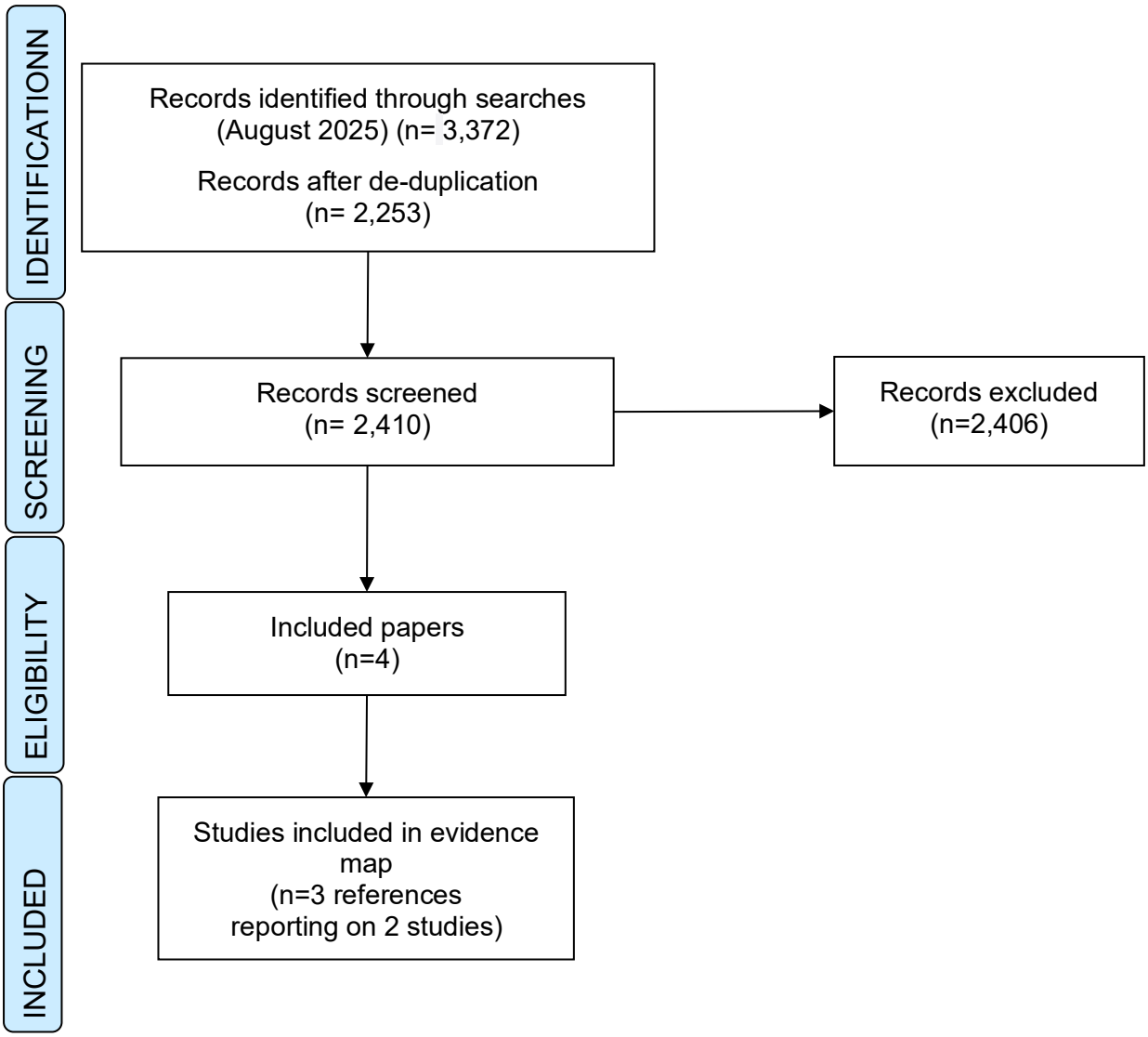
Identified references from the bibliographic database searches were downloaded into EndNote bibliographic management software for further assessment and handling. Individual records within the EndNote libraries were tagged with searching information, such as searcher, date searched, database host, database searched, strategy name and iteration, theme or search question. This enabled the information specialist to track the origin of each individual database record, and its progress through the screening and review process.

For all searches undertaken by the Kleijnen Systematic Reviews Information team, the main Embase strategy was independently peer reviewed by a second KSR Information Specialist. Strategy peer review was informed by items based on the CDA (Canada's Drug Agency) PRESS checklist (https://www.cda-amc.ca/press-peer-review-electronic-search-strategies).

Summary of findings

As detailed in Appendix 1, searches were conducted on 20 August 2025. A total of 3,372 references were identified. After de-duplication, 2,410 references remained for screening.

Please see the PRISMA flow diagram below for a more detailed overview.



One reviewer screened all titles and abstracts, a second reviewer screened the references using ASReview, an open-source AI for screening references (https://asreview.nl/). All references were reviewed at abstract level. A formal quality appraisal of the evidence was not required, given the remit of the evidence map.

Research question 1

The current evidence map focused in answering whether there is enough evidence from randomised controlled trials (RCTs) demonstrating the benefits of population screening for type 2 diabetes. For this research question after the initial screening 2,253 studies were identified. After title and abstract screening, 3 references reporting on 2 studies were identified and further considered for addressing the research question.[7-10] A summary of the studies is presented here along with more detailed information reported in Appendix 2.

- The first two references were treated as one study since they reported on the same data. These were systematic reviews which identified two RCTs, the ADDITION-Cambridge (people at high risk of having type 2 diabetes) and Ely (general population aged 40-65) which evaluated invitations to screening for diabetes.[7, 8] Both studies are relatively old (conducted during 2001-2006 and 1990-1992/2000-2003 respectively) and there have been no subsequent RCTs. The trials found no significant difference between the screening and control groups for all-cause mortality, diabetes-related mortality or cardiovascular disease mortality. There was also no material effect on quality of life at 7 through 13 years.
- For harms, the trials also reported no significant differences between screening and control groups for anxiety, depression, worry, or self-reported health, but one reported a short-term increase in anxiety at 6 weeks among persons screened and diagnosed with diabetes mellitus versus those not diagnosed. Both trials have been also discussed in the 2019 evidence summary.[6]
- Another reference relevant to the research question was a Cochrane review.[9] The authors included one RCT, the ADDITION-Cambridge study, and concluded that the evidence from this study demonstrated no substantial differences in all-cause and diabetes-related mortality over a 10-year period between participants at high-risk for diabetes who were either screened or not screened for diabetes. This was also identified in the 2019 evidence summary.[6]

In summary, no strong evidence was detected suggesting that screening can have beneficial outcomes to people identified as having T2DM, but there is still uncertainty around the effects of population screening on T2DM. Overall, after reviewing the available evidence to date, there is an insufficient volume of evidence for the population screening of asymptomatic people for T2DM to justify an evidence summary. The type of evidence identified is unlikely to lead to a change in the UK NSC's current position. Therefore, another evidence map in three years' time is recommended at this stage.

Other informative evidence

During the screening stage some additional evidence was identified. The studies presented here do not meet the inclusion/exclusion criteria for the current research question, but they are of an informative nature for future research. These studies have been divided into two categories; screening strategies and modelling.

Screening strategies

Two screening strategies papers were identified.[11, 12]

Both studies are protocols, one for a cluster randomised trial and the other for a systematic review respectively. Therefore, although the studies are in the protocol stage, it was decided that it is important to include them for a potential future update where they will be concluded and have relevant outcomes. The study protocol is focusing on opportunistic screening of socioeconomically disadvantaged areas of Sweden.[11] The protocol for a systematic review is focusing on screening strategies for T2DM and although currently there is no mention of including RCTs, it might provide additional sources of evidence at a future point (e.g., data validation).[12]

Modelling

Four additional studies were identified with a focus on modelling of screening strategies.[13-15, 10]

The first study has a focus on modelling of different screening tests in the USA , reporting on sensitivity, lifetime costs and quality-adjusted life year (QALYs) outcomes.[13] The second study is a systematic review of economic evaluations of different screening strategies.[14] The third study is another systematic review reporting on cost and cost-effectiveness of screening and prevention of T2DM of women who previously had gestational diabetes.[15] The fourth study was a systematic review summarising one RCT, namely ADDITION Europe and prepared a “validated simulation computer model” using data from the RCT reporting on early diagnosis effects.[10]

All four studies are beyond the scope of the present evidence map, but they potentially have relevant information for future updates, therefore included in the summary of findings. More detailed description is not provided in Appendix 2, since only the included studies that were relevant to the current research question are presented there.

Conclusions

The findings of this evidence map are unlikely to impact on current recommendations on screening for T2DM as no new evidence was identified that would change those conclusions.

Recommendations

Based on the available evidence deriving from this evidence map, the volume and type of evidence related to population screening for T2DM in currently insufficient to justify an update review at this stage and so the recommendation is to be considered again in 3 years' time.

Appendix 1 — Search strategy for the evidence map

Databases and platforms searched

Resource	Host	Date range	Date searched	Records found before deduplication	Records found after deduplication
MEDLINE	Ovid	1946 – 18.8.25	19.8.25	913	910
Embase	Ovid	1974 – 14.8.25	19.8.25	1669	1023
CENTRAL	Cochrane	Issue 7/12, July 2025	19.8.25	566	260
CDSR	Cochrane	Issue 8/12, August 2025	19.8.25	20	20
KSR Evidence	https://ksrevidence.com/	To 19.8.25	19.8.25	45	40
Trip Database	**https://www.tripdatabase.com/**	**To 19.8.25**	**19.8.25**	**67**	**65**
NICE Guidance	**https://www.nice.org.uk/guidance**	**To 19.8.25**	**19.8.25**	**4**	**4**
HTA Database	**https://database.inahta.org/**	**To 19.8.25**	**19.8.25**	**88**	**88**
Update check of previous guidelines					
TOTAL				**3372**	**2410**

Search strategies

MEDLINE and Epub Ahead of Print, In-Process, In-Data-Review & Other Non-Indexed Citations, Daily and Versions (Ovid): 1946 to August 18, 2025
Date searched: 19.8.25
Records found: 913

1 exp Diabetes Mellitus, Type 2/ 192006
2 ((typ$ 2 or typ$ ii or typ$ two or type2 or typeii) adj3 diabet$).ti,ot,ab. 218770
3 ((adult-onset or adult onset or matur$ or late or slow or stable) adj3 diabet$).ti,ot,ab. 6555
4 (T2dm or DM2 or DM-2 or T2-DM or NIDDM).ti,ab,ot. 52469
5 ((insulin-independent or ketosis-resistant) adj3 diabet$).ti,ab,ot,hw. 275
6 (non insulin$ depend$ or noninsulin$ depend$ or noninsulin?depend$ or non insulin?depend$).ti,ab,ot. 12552
7 ((non insulin or noninsulin) adj3 diabet$).ti,ab,ot. 12025
8 or/1-7 280676
9 Mass Screening/ 122313

10 early diagnosis/ 32276
11 (screen$ or (early adj3 (diagnos$ or detect$))).ti,ab,ot. 1387889
12 9 or 10 or 11 1428199
13 8 and 12 19688
14 exp randomized controlled trial/ 645708
15 controlled clinical trial.pt. 95726
16 randomized.ab. 704812
17 placebo.ab. 261170
18 clinical trials as topic/ 205548
19 randomly.ab. 466884
20 trial.ti. 343514
21 or/14-20 1706689
22 exp animals/ not humans/ 5364777
23 21 not 22 1574301
24 13 and 23 2044
25 (201812$ or 2019$ or 2020$ or 2021$ or 2022$ or 2023$ or 2024$ or 2025$).dt. 10165052
26 24 and 25 920
27 limit 26 to english language 913

Embase (Ovid): 1974 - 2025 August 14
Date searched: 19.8.25
Records found: 1669

1 *non insulin dependent diabetes mellitus/ 215718
2 ((typ$ 2 or typ$ ii or typ$ two or type2 or typeii) adj3 diabet$).ti,ot,ab. 350629
3 ((adult-onset or adult onset or matur$ or late or slow or stable) adj3 diabet$).ti,ot,ab. 9782
4 (T2dm or DM2 or DM-2 or T2-DM or NIDDM).ti,ab,ot. 85687
5 ((insulin-independent or ketosis-resistant) adj3 diabet$).ti,ab,ot,hw. 354
6 (non insulin$ depend$ or noninsulin$ depend$ or noninsulin?depend$ or non insulin?depend$).ti,ab,ot. 15119
7 ((non insulin or noninsulin) adj3 diabet$).ti,ab,ot. 14352
8 or/1-7 403556
9 *mass screening/ or *screening/ or *screening test/ 85075
10 *early diagnosis/ 17167
11 (screen$ or (early adj3 (diagnos$ or detect$))).ti,ab,ot. 1994195
12 or/9-11 2004827
13 8 and 12 31124
14 crossover-procedure/ or double-blind procedure/ or exp randomized controlled trial/ or single-blind procedure/ 1205291
15 (random$ or factorial$ or crossover$ or cross over$ or cross-over$ or placebo$ or (doubl$ adj blind$) or (singl$ adj blind$) or assign$ or allocat$ or volunteer$).ti,ab,ot. 3419675
16 14 or 15 3561860
17 animal/ or animal experiment/ 5080087
18 (rat or rats or mouse or mice or murine or rodent or rodents or hamster or hamsters or pig or pigs or porcine or rabbit or rabbits or animal or animals or dogs or dog or cats or cow or bovine or sheep or ovine or monkey or monkeys).ti,ab,ot,hw. 8264698

19 17 or 18 8264698
20 exp human/ or human experiment/ 28914397
21 19 not (19 and 20) 6085613
22 16 not 21 3241040
23 13 and 22 6122
24 ("conference abstract" or "conference review").pt. or conference$.so,st. 5632459
25 clinicaltrialsgov.jn. 533511
26 23 not (24 or 25) 3187
27 (comment or editorial or letter or news).pt. 2218070
28 26 not 27 3183
29 (201812$ or 2019$ or 2020$ or 2021$ or 2022$ or 2023$ or 2024$ or 2025$).dd. 13933384
30 28 and 29 1757
31 limit 30 to english language 1669

The Cochrane Library
https://www.cochranelibrary.com/
Date searched: 19.8.25

Cochrane Database of Systematic Reviews: Issue 8 of 12, August 2025 – 20 records
Cochrane Central Register of Controlled Trials: Issue 7 of 12, July 2025 – 566 records

#1 MeSH descriptor: [Diabetes Mellitus, Type 2] explode all trees 26908
#2 (((typ* next 2) or (typ* next ii) or (typ* next two) or type2 or typeii) near/3 diabet*):ti,ab 52198
#3 (("adult-onset" or "adult onset" or matur* or late or slow or stable) near/3 diabet*):ti,ab 953
#4 (T2dm or DM2 or "DM-2" or "T2-DM" or NIDDM):ti,ab 11278
#5 (("insulin-independent" or "ketosis-resistant") near/3 diabet*):ti,ab 24
#6 ((non next insulin* next depend*) or (noninsulin* next depend*) or noninsulin?depend* or (non next insulin?depend*)):ti,ab 2379
#7 (("non insulin" or noninsulin) near/3 diabet*):ti,ab 2337
#8 #1 or #2 or #3 or #4 or #5 or #6 or #7 58932
#9 MeSH descriptor: [Mass Screening] this term only 5188
#10 MeSH descriptor: [Early Diagnosis] this term only 790
#11 (screen* or (early near/3 (diagnos* or detect*))):ti,ab 115736
#12 #9 or #10 or #11 116772
#13 #8 and #12 4643
#14 #13 with Cochrane Library publication date Between Jan 2018 and Jul 2025, in Cochrane Reviews 20
#15 (trial registry record or Clinical trial protocol):pt 579220
#16 (conference or congress):ti,so,pt 273204
#17 #13 not (#15 or #16) with Publication Year from 2018 to 2025, in Trials 566

KSR Evidence: to 19.8.25
https://ksrevidence.com/
Date searched: 19.8.25
Records found: 45

1 ("typ* 2" or "typ* ii" or "typ* two" or type2 or typeii) near/3 diabet* in Title or Abstract 7368 results
2 ("adult-onset" or "adult onset" or matur* or late or slow or stable) near/3 diabet* in Title or Abstract 41 results
3 T2dm or DM2 or "DM-2" or "T2-DM" or NIDDM in Title or Abstract 2582 results
4 ("insulin-independent" or "ketosis-resistant") near/3 diabet* in Title or Abstract 0 results
5 "non insulin* depend*" or "noninsulin* depend*" or noninsulin?depend* or "non insulin?depend*" in Title or Abstract 26 results
6 ("non insulin" or noninsulin) near/3 diabet* in Title or Abstract 44 results
7 #1 or #2 or #3 or #4 or #5 or #6 in All text 7546 results
8 screen* or (early near/3 (diagnos* or detect*)) in Title 3432 results
9 #7 and #8 in All text Date published: 2018 - 2025 45 results

Trip Database: to 19.8.25
https://www.tripdatabase.com/
Date searched: 19.8.25
Records found: Guidelines – 67
Regulatory Guidance - 0

Limits:
Guidelines/Regulatory Guidance
2018-2025

5 (#4) AND (#1) 4151
4 (#3) OR (#2) 63998
3 title:screening 61674
2 title:"early diagnosis" 2416
1 (diabetes OR diabetic) 375122

NICE Guidance: to 19.8.25
https://www.nice.org.uk/guidance
Date searched: 19.8.25
Records found: 4

Limits:
Type: Guidance
Status: Published
Year: 2018-2025

Search - Diabetes

HTA Database: to 19.8.25
https://database.inahta.org/
Date searched: 19.8.25
Records found: 88

Limits:

Year: 2018-2025
Project Status: Completed

Search History
9 #8 AND #7 200
8 screen* or "early diagnos*" or "early detect*" 1638
7 #6 OR #5 OR #4 OR #3 OR #2 OR #1 1425
6 "non insulin* depend*" or "noninsulin* depend*" or noninsulin?depend* or "non insulin?depend*" 1024
5 ("insulin-independent" or "ketosis-resistant") and diabet* 4
4 T2dm or DM2 or "DM-2" or "T2-DM" or NIDDM 26
3 ("adult-onset" or "adult onset" or matur* or late or slow or stable) and diabet* 37
2 ("type 2" or "type ii" or "type two" or type2 or typeii) and diabet* 363
1 "Diabetes Mellitus, Type 2"[mhe] 294

Inclusion/exclusion criteria

Research question: Have RCTs demonstrated the benefit of population adult screening for type 2 diabetes?

Item	Included	Excluded
Population	• Adults aged ≥18 years (without diagnosis of T2DM)	• Adults aged ≥18 years (with diagnosis of T2DM) • Paediatric populations (age <18 years)
Intervention	• Any screening strategy	NA
Comparator	• No screening or routine clinical diagnosis	NA
Outcomes	• Reduction of blood glucose levels • Reduction of the risk of cardiovascular disease, including decreased blood pressure, lower cholesterol levels and lower BMI. • Reduction of the risk of retinopathy and nephropathy. • Reduction of gangrene • Reduced mortality • Improved quality of life • Any harms e.g. overdiagnosis, overtreatment	• Studies which do not report the outlined outcomes
Study designs	• Randomised controlled trials (RCTs) • Systematic and rapid reviews of RCTs.	• Case series • Single arm studies • Editorials • Non-RCTs
Timeframe & Language	• Published since January 2018 in English	• Published prior to 2018 • Not in English
Geographical scope	• UK studies will be prioritised but in the absence of studies-comparable countries will be reported	• Studies from countries that their health system is not comparable
NA= not applicable; RCT= randomised controlled trial; T2DM= Type 2 diabetes mellitus		

Appendix 2 – Identified evidence

Searches for this evidence map identified 3 references (2 studies in total since 2 of the 3 references reported the same data and treated as one study). Key characteristics for each study are presented below:

Citation 1 & 2 – Jonas 2021

Study type & Country

Systematic Review, UK[7, 8]

Population (for the relevant studies from the review)

- Non-pregnant adults aged 35 to 70 years seen in primary care settings who have overweight or obesity (defined as a body mass index ≥25 and ≥30, respectively) and no symptoms of diabetes.
- ADDITION-Cambridge n=20,184 participants, Ely n=4,936 participants[7, 8]

Objectives

To update its 2015 recommendation, the United States Preventive Services Task Force (USPSTF) commissioned a systematic review to evaluate screening for prediabetes and type 2 diabetes in asymptomatic, nonpregnant adults and preventive interventions for those with prediabetes.

Conclusions

- The USPSTF recommends screening for prediabetes and type 2 diabetes in adults aged 35 to 70 years who have overweight or obesity.
- Clinicians should offer or refer patients with prediabetes to effective preventive interventions.

Citation 3 – Peer 2020

Study type & Country

Systematic review, UK[9]

Population (for the relevant studies from the review)

- ADDITION-Cambridge n=20,184
- 36% of participants were women
- Average age of participants was 58.2 years in the screening group and 57.9 years in the no-screening group

Objectives

To assess the effects of screening for type 2 diabetes mellitus.

Conclusions

- We are uncertain about the effects of screening for type 2 diabetes on all-cause mortality and diabetes-related mortality.
- Evidence was available from one study only.
- Therefore, unable to draw any firm conclusions relating to the health outcomes of early type 2 diabetes mellitus screening.
- The included study did not assess all the outcomes prespecified in the review (diabetes-related morbidity, incidence of type 2 diabetes, health-related quality of life, adverse events, socioeconomic effects).

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