Optimising glycaemic control in type 1 diabetes

Voting on published recommendations – Key Question 4: monitoring and insulin technologies

ROUND 1: RESPONSES

Group members were asked to vote on the acceptability and implementability within NHS Scotland of 8 recommendations published in evidence-based guidelines on the topic of combinations of glucose monitoring and insulin delivery technologies for people with type 1 diabetes. The threshold of 70% of respondents indicating acceptance was established a priori as the definition of formal consensus. Results are summarised in the table below. Further details about adaptations and actions are included in the accompanying report.

Recommendation	Acceptable (%)		Implementable (%)			Action
	Yes	No	Yes	Yes, with adaptation	No	
1	87.50%	12.50%	85.71%	14.29%	0.00%	Include
2	87.50%	12.50%	42.86%	50.00%	7.14%	Include
3	81.25%	18.75%	76.92%	23.08%	0.00%	Include
4	100.00%	0.00%	81.25%	18.75%	0.00%	Include
5	100.00%	0.00%	93.75%	6.25%	0.00%	Include
6	100.00%	0.00%	87.50%	12.50%	0.00%	Include
7	87.50%	12.50%	71.43%	28.57%	0.00%	Include
8	93.75%	6.25%	66.67%	33.33%	0.00%	Include

The following responses, potential adaptations and comments were returned.

Recommendation 1

Recommendation: To minimise inequalities in accessing diabetes technologies, clinicians should pro-actively initiate meaningful discussions with all patients with type 1 diabetes about the suitability of a closed loop system for their individual circumstances.

Single hormone closed loop systems should be available to people with type 1 diabetes (paediatric and adult) who:

- under their current diabetes care plan, continue to have suboptimal glycaemic control, a high risk of severe hypoglycaemia, or impaired awareness of hypoglycaemia, or
- experience diabetes-related distress, measured using a validated tool, that adversely affects quality of life or their ability to manage diabetes, and which is likely to be improved by moving to a closed loop system.

People who can achieve the desired glycaemic targets using finger prick testing, flash glucose monitoring or continuous glucose monitoring plus multiple daily injections or flash glucose monitoring plus an insulin pump, should be supported to remain on their current diabetes care plan subject to their circumstances and quality of life. People who are currently

using continuous glucose monitoring in combination with an insulin pump (non-integrated) should be offered a closed loop system, which may provide them with additional clinical benefits at lower costs.

In their discussions, people with type 1 diabetes and clinicians must consider the day-to-day requirements of managing closed loop systems, for example, responding to alerts or replacing sensors when required. Support on how to use the closed loop system effectively should be provided to everyone offered the technology.

The Scottish Care Information (SCI)-Diabetes database should be used to collect clinical and person reported outcomes data from people with type 1 diabetes using closed loop systems. These data will be used to inform quality of care improvements and future advice for NHSScotland.

Source guideline: Scottish Health Technology Group (SHTG). Recommendation- Closed loop systems and the artificial pancreas for the management of type 1 diabetes (https://shtg.scot/media/2155/shtg-recommendation-closed-loop-systems-and-the-artificial-pancreas-for-type-i-diabetes-mellitus-t1dm.pdf)

Country and date of publication: UK, 2022

Guideline quality rating: N/A (This is a health technology appraisal which is directly relevant to the question, but which cannot be appraised using the same methods as guidelines)

Of 16 respondents:

14 voted this recommendation as acceptable (87.50%)

2 voted this recommendation as unacceptable (12.50%)

Of the 14 respondents who voted this recommendation as acceptable:

12 voted this recommendation as implementable (85.71%)

2 voted this recommendation as implementable with adaptations (14.29%)

0 voted this recommendation as not implementable (0.00%)

14 out of 16 (87.50%) respondents voted that this recommendation was acceptable so consensus has been reached. This recommendation will be included in the draft guideline. The glucose monitoring/insulin delivery technologies subgroup will discuss the context in Scotland and any supporting information which may help with implementation.

Respondents' suggested adaptations and other comments are detailed in table 1:

Table 1: suggested adaptations and responses to recommendation 1

Respondent	Response and comments
9	ADAPTATION - Para 1 states that "all patients" should be offered closed loop in order to "minimise inequalities". The statement then goes on to include specific examples where closed loop should be made available. This latter part seems unnecessary, given that it should be offered to all.

12	ADAPTATION - A rewording could be “... experience diabetes-related distress, as assessed by a trained experienced diabetes health professional....”
2	COMMENT - Closed loop insulin delivery should be the standard of care for all with T1 diabetes unless clear contraindications (of which there are almost none) exist or individual patient preference favours another option.
3	COMMENT - The main barrier to implementation of this approach is financial. I'm not sure about excluding those seemingly doing well on more traditional therapy as HCL is likely to benefit those individuals too and it seems harsh to wait on people failing or struggling to then be able to offer them the tools that are needed.
4	COMMENT - Clinicians will be able to provide more relevant responses than me but I would have thought that, despite the laudable ambition to minimise inequalities, that something "potentially appropriate" between all and patients would be more appropriate.
5	COMMENT - To reduce health inequalities, we need to acknowledge the additional support that will be needed to safely and effectively transition patients with suboptimal glycaemic control onto pumps and that will need to be reflected in adequate staffing of MDT's.
7	COMMENT - Change patient to person on second line of recommendation.
8	COMMENT - The statement says "...experience diabetes-related distress, measured using a validated tool", but I am not aware of a validated tool for children for measuring diabetes-related distress. I would say that all children and young people experience diabetes related distress, and that all should be eligible to HCL.
9	COMMENT - Very supportive of guidelines including data requirements to ensure quality improvement (ie SCI-Diabetes data items), including other metrics of glucose control.
11	COMMENT - resources at service level main issue with implementation.
12	COMMENT - • The evidence base in terms of psychometric measures in relation to closed loop systems is very sparse (only 3 studies were cited in the SHTG guidance) • The measures recommended in the SHTG guidance had been demonstrated in their own citations not to improve with closed loop systems. • Applying a psychometric scale which has been used in a pre / post study design to use with random cut offs in clinical practice is not evidence based or scientific or in any way practical • It is important to note that none of the clinical experts were those with expertise in MH PROMS (eg from SDG SLWG in MH PROMS)/ psychological components. • Of course all the psychometric measures suggested are screening questionnaires; all health professionals working in diabetes should be able to identify diabetes distress without any screening questionnaires if trained appropriately and this is not an entity like HbA1c which you can grade - as it is open to subjective and objective interpretation.

	• If a short-form DRD questionnaire is used in isolation, it may miss significant psychological factors present in those who manage to maintain an optimal control including those who develop restrictive food practices, those who develop obsessional attitudes to management, those who teeter at the verge of burnout constantly, those who have significant anxiety regarding hyperglycaemia/ complications and other discrete Diabetes related Distress states. • In addition there may be some people who do not score highly on the questionnaires but still have some extreme specific diabetes related distress and they would be at risk of missing out on such technology. • I know that most of us would like to see adequate provision of technology to all who would wish to use it for the purposes of improving control and / or making life so much less hard, but following the route recommended by the SHTG and using questionnaires like the DDS or PAID are used as gatekeepers to closed loop therapy will lead to a postcode lottery for closed loops. I fear this would lead to considerable inequitable provision across Scotland.
13	COMMENT - resources and staffing levels to support may be an issue.
14	COMMENT - will this guideline consider pregnant women with type 1 or will that be covered in the pregnancy diabetes SIGN update?
16	COMMENT - Having clinicians initiate discussions about closed-loop systems with all those who have T1D is right so that everyone has the opportunity to know that closed-loop systems exist. I am really pleased to see that diabetes distress that adversely affects quality of life and ability to manage diabetes is a factor in deciding whether someone can have a closed-loop system, but I would like to know how distressed they have to be and for how long, to qualify. I think it is important that diabetes distress causing low quality of life and reduced ability to manage diabetes is prevented or at the very least nipped in the bud when the initial signs are there. Regular monitoring of diabetes distress levels for all those with T1D would be needed to discover people in diabetes distress who, for example, wouldn't otherwise speak up and feel like they have no option but to quietly 'get on with it' until they reach breaking point.
17	COMMENT - Fully supportive of this guidance. There is ongoing discussions about defining and capturing data on diabetes distress which are important aspects of implementation but they shouldn't necessarily influence the recommendation.

Recommendation 2

Recommendation: Insulin pump with CGM or SAP is recommended to manage all persons with diabetes treated with intensive insulin management who prefer not to use automated insulin suspension/dosing systems or have no access to them.
[GRADE A]

Source guideline: Grunberger G, Sherr J, Allende M, Blevins T, Bode B, Handelsman Y, et al. American Association of Clinical Endocrinology Clinical Practice Guideline: The Use of Advanced Technology in the Management of Persons With Diabetes Mellitus. Endocr Pract. 2021 Jun;27(6):505-537 (recommendation 2.8.1, page 521) (https://www.endocrinepractice.org/action/showPdf?pii=S1530-891X%2821%2900165-8)

Country and date of publication: USA, 2021

Guideline quality rating: Rigour of development 92%, Editorial independence 92%, Stakeholder involvement 43%

Of 16 respondents:

14 voted this recommendation as acceptable (87.50%)

2 voted this recommendation as unacceptable (12.50%)

Of the 14 respondents who voted this recommendation as acceptable:

6 voted this recommendation as implementable (42.86%)

7 voted this recommendation as implementable with adaptations (50.00%)

1 voted this recommendation as not implementable (7.14%)

14 out of 16 (87.50%) respondents voted that this recommendation was acceptable so consensus has been reached. This recommendation will be included in the draft guideline. The glucose monitoring/insulin delivery technologies subgroup will discuss the context in Scotland and any supporting information which may help with implementation.

Respondents' suggested adaptations and other comments are detailed in table 2:

Table 2: suggested adaptations and responses to recommendation 2

Respondent	Response and comments
4	ADAPTATION - Subject to availability of resources
10	ADAPTATION - Change mgs to mmols, change HbA1c to mmols from %.
11	ADAPTATION - staff and funding increases needed.
12	ADAPTATION - Would need to ensure holistic consideration of person and whether this is appropriate treatment in context of diabetes and overall quality of life.
14	ADAPTATION - As per SHTG this should be on individual want/need and will require discussion with person about what technologies will be most suitable for them. Not everyone on MDI will want a pump.

16	ADAPTATION - Is the meaning of 'has no access to them' refer to USA medical insurance not covering closed loop systems? I notice that in this recommendation technology is being used to manage the person. In my view the technology is to be used by the people, (e.g. person with diabetes, their family/carer, diabetes team) to manage diabetes.
17	ADAPTATION - This recommendation is applicable to those individuals with T1 and T2 diabetes as well as some cases of secondary diabetes etc. As this guidance is limited in scope to T1DM then we need to ensure the recommendations reflect this.
2	COMMENT - Not really sure what this means. In reality almost all CSII users in Scotland are also on CGM (mostly Libre 2) so this is essentially a statement of current practice.
3	COMMENT - I suppose this statement may apply to those on Omnipod which will hopefully link soon.
6	COMMENT - The terminology doesn't fit with the Scottish context.
8	COMMENT - I think that the most modern systems that facilitate AID should be used for all. If their technology can support sensor augmented pump then why would then not wish to use it? I think this would never be the case in children and young people, and don’t think we should be encouraging this. There may be some adult patients who do not wish to use the technology, but I would hope this would be the minority and they would embrace the full AID over time.
9	COMMENT - I don't understand this statement which seems to be contradictory. Regardless, it seems to be superseded by SHTG statement.
16	COMMENT - The reading of 'who prefer not to use automated insulin suspension/dosing systems' implies that if someone with T1D prefers to use a closed-loop system then they can. I'm all in favour of this but suspect that might not be what it means. I think SAP (sensor augmented pump) would need to be defined. I tried working it out from the guideline doc and concluded it means open loop, but not 100% sure.

Recommendation 3

Recommendation: The use of an insulin pump without CGM could be used to manage persons with diabetes who are achieving glycemic targets with minimal TBR, or who report infrequent episodes of symptomatic hypoglycemia, and who are using SMBG on a regular basis (at least 4 times per day for persons with T1D).
[GRADE B]

Source guideline: Grunberger G, Sherr J, Allende M, Blevins T, Bode B, Handelsman Y, et al. American Association of Clinical Endocrinology Clinical Practice Guideline: The Use of Advanced Technology in the Management of Persons With Diabetes Mellitus. Endocr Pract. 2021 Jun;27(6):505-537 (recommendation 2.7.1, page 521) (https://www.endocrinepractice.org/action/showPdf?pii=S1530-891X%2821%2900165-8)

Country and date of publication: USA, 2021

Guideline quality rating: Rigour of development 92%, Editorial independence 92%, Stakeholder involvement 43%

Of 16 respondents:

13 voted this recommendation as acceptable (81.25%)

3 voted this recommendation as unacceptable (12.50%)

Of the 13 respondents who voted the recommendation as acceptable:

10 voted this recommendation as implementable (76.92%)

3 voted this recommendation as implementable with adaptations (23.08%)

0 voted this recommendation as not implementable (0.00%)

13 out of 16 (81.25%) respondents voted that this recommendation was acceptable so consensus has been reached. This recommendation will be included in the draft guideline. The glucose monitoring/insulin delivery technologies subgroup will discuss the context in Scotland and any supporting information which may help with implementation.

Respondents' suggested adaptations and other comments are detailed in table 3:

Table 3: suggested adaptations and responses to recommendation 3

Respondent	Response and comments
3	ADAPTATION - Whilst there are still some people on CSII which does not link to automated CGM this may be acceptable but our aspiration should surely be to move all those on CSII to automated CGM when upgrading.
10	ADAPTATION - Change mg to mmols.
12	ADAPTATION – Consider other groups.
2	COMMENT - I have said no because this applies to almost no one in reality in Scotland. However, of course, if someone preferred to use a pump and HBGM then that would be fine.

5	COMMENT - I think all patients should be offered hybrid closed loop therapy as the evidence shows that reduces risk of hypoglycaemia and reduces burden of diabetes, Therefore pump therapy should perhaps only be used as a standalone technology, if the patient did not want to use hybrid closed loop technology.
6	COMMENT - I think this option should be at the request of the patient not the health care team, i.e. all type 1 patients should be offered a CGM and a pump and the patient at that point can ask to opt out of one or the other, or both. The key to this one is the wording.
8	COMMENT - It is not relevant to children and young people. If the pump can support AID then it should be used with linked CGM. I am aware we have patients on Omnipod who cannot use AID, but we hope this will be available soon, and we would then want to move all onto the HCL option with linked CGM.
9	COMMENT - Hybrid closed loop is not for everyone, and so it makes sense to continue to offer insulin pumps to those who SMBG.
11	COMMENT - patient choice, for some this will be patient led.
16	COMMENT - I have said yes because I think this recommendation is for the purpose of providing insulin pumps to those who don't have one already and have turned down CGM (recommendation 4 or 5) so they can't use recommendation 1 or 2. I don't think it is ideal to use an insulin pump without CGM because CGM provides valuable information for pump settings (basal rates, carb ratios, ISF) and both life and serious-harm saving alerts in the case of a severe lack of, or overdose of, insulin caused by insulin pump error, user error or user burnout/distress. I would not like this recommendation to promote the use of insulin pumps without CGM but rather to give choice.
17	COMMENT - I think this recommendation highlights the challenge of how we define CGM. Is we are using FGM as interchangeable as isCGM as per NICE then arguably anyone on insulin pump therapy would have access to CGM albeit isCGM as opposed to rtCGM.

Recommendation 4

Recommendation: Offer adults with type 1 diabetes a choice of real-time continuous glucose monitoring (rtCGM) or intermittently scanned continuous glucose monitoring (isCGM, commonly referred to as 'flash'), based on their individual preferences, needs, characteristics, and the functionality of the devices available. (See box 1 for examples of factors to consider as part of this discussion).
[STRONG RECOMMENDATION]

Source guideline: National Institute for Health and Care Excellence (NICE). NG17 - Type 1 diabetes in adults: diagnosis and management (recommendation 1.6.10, page 18) (https://www.nice.org.uk/guidance/ng17/resources/type-1-diabetes-in-adults-diagnosis-and-management-pdf-1837276469701)
(Includes access to 'Box 1')

Country and date of publication: UK, 2022

Guideline quality rating: Rigour of development 98%, Editorial independence 100%, Stakeholder involvement 98%

Additional notes: The recommendation also refers the reader to an information box containing factors to consider when choosing a continuous glucose monitoring device. The NICE evidence review for CGM (2022) notes "The committee highlighted that the individual choice element of different CGM devices would be a benefit to healthcare service users, as the 'best' device for each individual would depend on their preferences, needs and characteristics. They therefore included a summary table in the recommendations outlining the factors to consider when choosing a CGM device. The committee stated that this freedom of choice is more beneficial to the user than being limited to a specific device."

(See https://www.nice.org.uk/guidance/ng17/evidence/b-continuous-glucose-monitoring-in-adults-with-type-1-diabetes-pdf-11013435182)

Of 16 respondents:

16 voted this recommendation as acceptable (100.00%)

0 voted this recommendation as unacceptable (0.00%)

13 voted this recommendation as implementable (81.25%)

3 voted this recommendation as implementable with adaptations (18.75%)

0 voted this recommendation as not implementable (0.00%)

16 out of 16 (100.00%) respondents voted that this recommendation was acceptable so consensus has been reached. This recommendation will be included in the draft guideline. The glucose monitoring/insulin delivery technologies subgroup will discuss the context in Scotland and any supporting information which may help with implementation.

Respondents' suggested adaptations and other comments are detailed in table 4:

Table 4: suggested adaptations and responses to recommendation 4

Respondent	Response and comments
4	ADAPTATION - Subject to availability of resources.
9	ADAPTATION - Given evidence of benefit from CGM being greater than that derived from flash glucose monitoring, then any recommendation should be weighted towards CGM.
13	ADAPTATION - Not sure of the practicality/ feasibility of being able to offer a choice of all devices available.
2	COMMENT - Libre 2 / Dexcom one should suffice for most people on MDI. People on pumps should have access to CGM which permits closed loop.
16	COMMENT – This is wonderful.
17	COMMENT – The main issue will be affordability. isCGM is widely available across Scotland and my understanding is that in the near future isCGM may well have intraoperability with insulin pumps. This will fundamentally influence where we place isCGM and rtCGM within our care pathway.

The following recommendations relate to glucose monitoring/insulin delivery technologies in children and young people with type 1 diabetes.

Recommendation 5

Recommendation: Offer real-time continuous glucose monitoring (rtCGM) to all children and young people with type 1 diabetes, alongside education to support children and young people and their families and carers to use it.
[STRONG RECOMMENDATION]

Source guideline: National Institute for Health and Care Excellence (NICE). NG18 - Diabetes (type 1 and type 2) in children and young people.: diagnosis and management (recommendation 1.2.60, page 16) (https://www.nice.org.uk/guidance/ng18/resources/diabetes-type-1-and-type-2-in-children-and-young-people-diagnosis-and-management-pdf-1837278149317)

Country and date of publication: UK, 2022

Guideline quality rating: Rigour of development 98%, Editorial independence 100%, Stakeholder involvement 98%

Of 16 respondents:

16 voted this recommendation as acceptable (100.00%)

0 voted this recommendation as unacceptable (0.00%)

15 voted this recommendation as implementable (93.75%)

1 voted this recommendation as implementable with adaptations (6.25%)

0 voted this recommendation as not implementable (0.00%)

16 out of 16 (100.00%) respondents voted that this recommendation was acceptable so consensus has been reached. This recommendation will be included in the draft guideline. The glucose monitoring/insulin delivery technologies subgroup will discuss the context in Scotland and any supporting information which may help with implementation.

Respondents' suggested adaptations and other comments are detailed in table 5:

Table 5: suggested adaptations and responses to recommendation 5

Respondent	Response and comments
5	ADAPTATION - Subject to availability of resources
16	COMMENT - This is wonderful. This is the only recommendation which includes education on how to use the technology.

Recommendation 6

Recommendation: Offer intermittently scanned continuous glucose monitoring (isCGM, commonly referred to as 'flash') to children and young people with type 1 diabetes aged 4 years and over who are unable to use rtCGM or who express a clear preference for isCGM. [STRONG RECOMMENDATION]

Source guideline: National Institute for Health and Care Excellence (NICE). NG18 - Diabetes (type 1 and type 2) in children and young people.: diagnosis and management (recommendation 1.2.61, page 16) (https://www.nice.org.uk/guidance/ng18/resources/diabetes-type-1-and-type-2-in-children-and-young-people-diagnosis-and-management-pdf-1837278149317)

Country and date of publication: UK, 2022

Guideline quality rating: Rigour of development 98%, Editorial independence 100%, Stakeholder involvement 98%

Additional notes: In March 2022, isCGM was licensed for children aged 4 and over.

Of 16 respondents:

16 voted this recommendation as acceptable (100.00%)

0 voted this recommendation as unacceptable (0.00%)

14 voted this recommendation as implementable (87.50%)

2 voted this recommendation as implementable with adaptations (12.50%)

0 voted this recommendation as not implementable (0.00%)

16 out of 16 (100.00%) respondents voted that this recommendation was acceptable so consensus has been reached. This recommendation will be included in the draft guideline. The glucose monitoring/insulin delivery technologies subgroup will discuss the context in Scotland and any supporting information which may help with implementation.

Respondents' suggested adaptations and other comments are detailed in table 6:

Table 6: suggested adaptations and responses to recommendation 6

Respondent	Response and comments
4	ADAPTATION - Surely parents'/guardians' preferences would be relevant to decisions for younger children.
8	ADAPTATION - With time we expect this group to be extremely small, or none, as rtCGM will be preferable for all. I assume it implies they have tried rtCGM and for some reason it is not suitable. So could we include some about offering a trial of rtCGM to all?
5	COMMENT - This is an odd recommendation, as I am not sure why a patient would be unable to use rtCGM but able to use an isCGM system.
16	COMMENT - This is good, important for people to have choice.

Recommendation 7

Recommendation: The continuation of CGM and/or CSII (insulin pump, SAP, LGS/PLGS) should be considered in hospitalized persons with diabetes without cognitive impairment and ideally with the presence of a family member who is knowledgeable and educated in the use of these devices or with a specialized inpatient diabetes team available for advice and support. [GRADE A]

Source guideline: Grunberger G, Sherr J, Allende M, Blevins T, Bode B, Handelsman Y, et al. American Association of Clinical Endocrinology Clinical Practice Guideline: The Use of Advanced Technology in the Management of Persons With Diabetes Mellitus. Endocr Pract. 2021 Jun;27(6):505-537. (recommendation 2.10.1, page 522) (https://www.endocrinepractice.org/action/showPdf?pii=S1530-891X%2821%2900165-8)

Country and date of publication: USA, 2021

Guideline quality rating: Rigour of development 92%, Editorial independence 92%, Stakeholder involvement 43%

Additional notes: The evidence supporting this recommendation was derived from mixed populations of people with type 1 and type 2 diabetes.

Of 16 respondents:

14 voted this recommendation as acceptable (87.50%)

2 voted this recommendation as unacceptable (12.50%)

Of the 14 who voted this recommendation as acceptable:

10 voted this recommendation as implementable (71.43%)

4 voted this recommendation as implementable with adaptations (28.57%)

0 voted this recommendation as not implementable (0.00%)

14 out of 16 (87.50%) respondents voted that this recommendation was acceptable so consensus has been reached. This recommendation will be included in the draft guideline.

The glucose monitoring/insulin delivery technologies subgroup will discuss the context in Scotland and any supporting information which may help with implementation.

Respondents' suggested adaptations and other comments are detailed in table 7:

Table 7: suggested adaptations and responses to recommendation 7

Respondent	Response and comments
8	ADAPTATION - For all children (up to age 12 years, and ideally 16 years) we would insist on a member of family being present , as ward nursing staff are unable to be trained to use pumps. We will never have 24 hour care by a nurse trained in pump use.
10	ADAPTATION - Change mg to mmols.
11	ADAPTATION - for adults individual needs to be fully self sufficient with pump / technologies use - and advice available to care teams to recognize patient self care fatigue or need as most NHS Scotland hospitals will not have diabetes team support 24/7.
12	ADAPTATION - Specialist diabetes team should be accessible as well as supports in place to ensure person has least disruptive diabetes care, however would need to be considered on wider presentation.
4	COMMENT - The mention of presence of a family member appears rather odd.
5	COMMENT - A family member would need to be around to support a child using a pump, as in most hospitals, I suspect the ward staff would be unable to provide the 24 hour support for its use when diabetes teams are not present.
6	COMMENT - The onus on whether pump technology in these circumstances should be down to the diabetes team in the hospital.
10	COMMENT - Although I think it should remain we need to be cautious if recommending continuation of CGM and or CSII in hospital. Would we need new guidance re inpatient nurse/pt review ratios to allow more time for inpatient nurse to review all on CSII/CGM - what about out of hours/weekends?
13	COMMENT - may be difficult in certain circumstances depending on specialist staffing.
14	COMMENT - Hospital staff would have to be aware and educated on how to support people to do this and clear guidance put in place for when someone is no longer able to manage their pump in a hospital setting.
16	COMMENT - I see this as allowing people with T1D who are hospitalised but well enough to manage their T1D using technology such as CGM and/or insulin pump to be allowed to do so, which is good. The topic of how T1D is managed in hospital is of great interest and at times concern to those with T1D and their families/carers. Regardless of who is responsible for insulin dosing/delivery and how it is delivered, CGM could provide a valuable safety net to alert ward staff to severe low/high glucose levels. Ward staff could have an appropriate level of training to know how to respond to CGM alarms.

17	COMMENT - Implementation of this guidance would need to be supported with educational resources for healthcare teams who operate in an in-patient setting.

Recommendation 8

Recommendation: Clinicians should prescribe CGM as a tool to track glucose before, during, and after exercise in persons with diabetes; monitor the glycemic response to exercise; and help direct insulin and carbohydrate consumption to avoid hypoglycemia and hyperglycemia. When this technology is utilized as part of automated insulin dosing systems, it can reduce glycemic excursions during exercise. [GRADE A]

Source guideline: Grunberger G, Sherr J, Allende M, Blevins T, Bode B, Handelsman Y, et al. American Association of Clinical Endocrinology Clinical Practice Guideline: The Use of Advanced Technology in the Management of Persons With Diabetes Mellitus. Endocr Pract. 2021 Jun;27(6):505-537. (recommendation 2.10.3, page 523) (https://www.endocrinepractice.org/action/showPdf?pii=S1530-891X%2821%2900165-8)

Country and date of publication: USA, 2021

Guideline quality rating: Rigour of development 92%, Editorial independence 92%, Stakeholder involvement 43%

Of 16 respondents:

15 voted this recommendation as acceptable (93.75%)

1 voted this recommendation as unacceptable (6.25%)

Of the 15 respondents who voted this recommendation as acceptable:

10 voted this recommendation as implementable (66.67%)

5 voted this recommendation as implementable with adaptations (33.33%)

0 voted this recommendation as not implementable (0.00%)

15 out of 16 (93.75%) respondents voted that this recommendation was acceptable so consensus has been reached. This recommendation will be included in the draft guideline. The glucose monitoring/insulin delivery technologies subgroup will discuss the context in Scotland and any supporting information which may help with implementation.

Respondents' suggested adaptations and other comments are detailed in table 8:

Table 8: suggested adaptations and responses to recommendation 8

Respondent	Response and comments
6	ADAPTATION - For Scotland, can flash be added without making this un-implementable?
8	ADAPTATION - Add real time??
10	ADAPTATION - mg to mmols
12	ADAPTATION - One of a number of tools available and if makes sense for the person.
14	ADAPTATION - NICE suggest in 'factors to consider when choosing a continuous glucose monitoring device':

	• Whether the person has situations when symptoms of hypoglycaemia cannot be communicated or can be confused (for example, during exercise) • Exercise should be a consideration when discussing possibility of CGM with an individual.
2	COMMENT - This is basically a restatement of other guidance except referring to exercise.
4	COMMENT - The wording suggests that CGM might be used for people with type 2 diabetes which I do not think is either appropriate or feasible.
8	COMMENT - Can we add real time? Or can we assume this is real time rather than intermittently scanned?
16	COMMENT - It's acceptable and implementable but if we have guidelines 4 and 5 that recommend a choice of CGM for everyone with T1D, do we need a guideline to say that CGM should be prescribed for exercise? The statements about using CGM data to manage diabetes before, during and after exercise and about closed loop systems keeping glucose levels in range during exercise are good. If the recommendation is used, the wording of the first sentence isn't great. The tool is primarily for the person with diabetes to use rather than the clinician, so should be something along the lines of, 'Clinicians should prescribe CGM as a tool for persons with diabetes to use to track their glucose before, during, and after exercise...'
17	COMMENT - Fully support this recommendation but again highlights the challenging terminology in this area. This guidance is implementable immediately if we are talking about isCGM however there would be challenges financially if this related to rtCGM. We will need to ensure consistent nomenclature/terminology across the guidance.