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# Swiss Diabetes and Technology recommendations

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## Summary

Technological advancements have significantly reshaped diabetes care. Diabetes and technology now encompass the hardware, devices and software required to treat diabetes mellitus. In Switzerland, these technologies are being increasingly adopted, especially by people living with type 1 diabetes, where continuous glucose monitoring (CGM) and automated insulin delivery (AID) systems are considered standards of care.

This document provides a comprehensive overview of all diabetes-related technologies currently available in Switzerland. It details their technical specifications, indications for use across diverse populations, compatibility, reimbursement regulations and practical guidance for implementation.

Recommendations extend to special populations: children and adolescents, pregnant women, older adults, and people with type 2 diabetes or other specific diabetes types (e.g. maturity-onset diabetes of the young [MODY] or pancreatogenic diabetes). In youth with type 1 diabetes, early adoption of continuous glucose monitoring and automated insulin delivery systems is strongly encouraged and is supported by the Swiss Society of Paediatric Endocrinology and Diabetology. During pregnancy, achieving and maintaining strict glycaemic targets is crucial for reducing pregnancy-related complications. Continuous glucose monitoring and automated insulin delivery improve glycaemic metrics and neonatal outcomes. In older adults, technologies can reduce hypoglycaemia risk and simplify management. For people with type 2 diabetes, continuous glucose monitoring and insulin pumps have shown benefits in glycaemic control, with growing evidence supporting the use of automated insulin delivery systems.

The document also highlights the expanding role of telemedicine and remote monitoring. While offering greater accessibility and patient-centred care, these tools raise challenges in terms of digital literacy, interoperability and data protection.

Finally, the integration of diabetes and technology into diabetes care requires structured education. Diabetes self-management education and support programmes such as Functional Insulin Therapy (FIT) are essential to help people acquire the knowledge and skills necessary to manage insulin therapy and use diabetes technology effectively and safely.

Overall, these recommendations aim to support effective and equitable use of diabetes technology throughout Switzerland and to guide healthcare providers, patients and policymakers towards improving diabetes outcomes.

## Introduction

Technological advances in recent years have changed the landscape of diabetes treatment [1, 2]. Historically, there were two categories of technology: (1) insulin delivery and (2) blood glucose monitoring systems. Today, diabetes and technology encompasses the hardware, devices and software required to treat diabetes mellitus.

Continuous Glucose Monitoring (CGM) systems have been considered the standard of care for patients affected by type 1 diabetes since 2021. In addition, insulin pump delivery can be adapted based on CGM data. Several Automated Insulin Delivery (AID) systems, consisting of an in-

**ABBREVIATIONS**

| | |
|---|---|
| **AID:** | automated insulin delivery |
| **CBGM:** | capillary blood glucose monitoring |
| **CGM:** | continuous glucose monitoring |
| **FGM:** | flash glucose monitoring |
| **TAR:** | Time Above Range |
| **TBR:** | Time Below Range |
| **TIR:** | Time In Range |
| **TITR:** | Time In Tight Range |

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sulin pump, a CGM system and an algorithm, are available on the Swiss market. They are highly effective in maintaining glucose levels within the expected range and should now be offered to all people living with type 1 diabetes [1, 3].

The aim of the Swiss Diabetes and Technology recommendations is to provide an up-to-date list of devices available in Switzerland, to explain specific features and existing evidence concerning their prescription in different kinds of populations, as well as training practices, and to provide information on accepted reimbursements to facilitate their use. This information is essential to improve the implementation of diabetes technology by all stakeholders such as patients, relatives, healthcare providers, insurers and regulators.

## Definitions and list of available devices

### Glucose monitoring systems

*Capillary Blood Glucose Monitoring (CBGM)* is the main, most traditional and accessible method of assessing glucose levels by doing a finger prick. It requires frequent tests to track trends. Glucometers used in Switzerland provide a result in millimoles per litre (mmol/l) using blood glucose test strips and they comply with the accuracy requirements of International Organisation of Standardisation (ISO) standard 15197:2015 (for glucose levels <5.6 mmol/l, 95% of the measurements may differ by up to ±0.83 mmol/l; for levels ≥5.6 mmol/l, the maximum admissible difference is ±15%). A list of all glucometers available in Switzerland can be found on the diabetesuisse.ch website (https://www.diabetesuisse.ch/personnes-touchees-et-proches/services/outils-techniques) and table 1 refers to the list of glucometers that can be connected to an insulin pump or a CGM sensor.

*Continuous Glucose Monitoring (CGM)* or *Flash Glucose Monitoring (FGM)* systems are wearable devices that continuously measure interstitial glucose level using the same enzymatic reaction as CBGM. They provide users with actual glucose values, rates of glucose change (trend arrows) and a glucose curve of up to 24 hours.

CGM systems last 7 to 15 days. They display glucose levels continuously with readings that are updated every 1–5 minutes and correlate well with stable plasma glucose value. In such conditions, the physiological equilibration time – defined as the time required for the movement of glucose from the plasma to the interstitial fluid – has been estimated to be 5 minutes (physiological lag time) [4].

These systems include alerts for critical glucose levels and integrate with data platforms for advanced diabetes management. The term "CGM system" will be used interchangeably for CGM or FGM in this article.

### Indications

CGM systems should be prescribed for individuals managing diabetes with multiple daily insulin injections to improve glycaemic control, to prevent acute glycaemic excursions and especially when there is a high risk of hypoglycaemia recurrence. Independently of the sensor type (CGM/FGM), their use allows users to improve metrics such as time-in-range (TIR) and HbA1c, and to reduce diabetes complications when used in structured diabetes self-management education programmes.

### Considerations for safe use of Continuous Glucose Monitoring systems

CGM systems offer advanced diabetes management capabilities, provided that appropriate advice is given on some of their limitations.

Here are some of the most important guidance points:

*Lag time:* CGM systems continuously measure interstitial glucose, which correlates well with plasma glucose in stable conditions (physiological lag time). In case of rapid glucose fluctuations, the delay can increase to >10–15 minutes due to the addition of instrumental delay (delay between changes in plasma glucose and measurements made by the CGM systems). Consequently, appropriate education and management are necessary for safe use.

*Accuracy:* Mean absolute relative difference (MARD) is a measure of the accuracy of CGM systems, comparing sensor readings with a reference glucose measurement. A lower MARD value indicates higher accuracy. Modern CGM systems have high accuracy when glucose levels are between 4 and 16 mmol/l (MARD <10%), but readings may be less reliable during hypoglycaemia, rapid changes and certain other factors (physical activity, acute illness, fever, metabolic stress). Some medications can influence the accuracy of CGM systems, i.e. acetaminophen/paracetamol

**Table 1:**
Glucometers available on the Swiss market that can be connected to an insulin pump or Continuous Glucose Monitoring (CGM) system.

| Manufacturer | Monitoring system | Trade name |
|---|---|---|
| Abbott | Glucometer | FreeStyle Libre 2 (can be connected to a CGM) |
| | | FreeStyle Libre 3 (can be connected to a CGM) |
| | Blood glucose test strips | FreeStyle Precision (FreeStyle Precision-β-Ketones) |
| Ascensia | Glucometer | Contour® XT |
| | | Contour® Next One |
| | Blood glucose test strips | Contour® NEXT |
| | | Contour® Next One |
| mylife diabetes care* | Glucometer | Unio™ Neva (can be connected to the insulin pump YpsoPump®) |
| | Blood glucose test strips | mylife Unio™ |
| Roche | Glucometer | Accu-Chek® Guide link (can be connected to an insulin pump) |
| | | Medtronic 740G and 780G |
| | Blood glucose test strips | Accu-Chek® Guide |

* In August 2024, Ypsomed sold its glucometer activities to Medical Technology and Devices S.p.A.

(notably older Dexcom G4/G5 and Medtronic CGM systems; Dexcom G6® is much improved at normal doses), high-dose vitamin C (notable for Dexcom G6® and FreeStyle Libre, leading to falsely high readings) and tetracycline (specifically highlighted for Eversense® CGM accuracy). Conditions like high altitudes or extreme temperatures can also impact sensor performance. The MARD required for non-adjunctive use of CGM systems is <10%. Furthermore, in 2017, the Food and Drug Administration (FDA) established specific requirements to allow integrated CGM systems to communicate with medical devices, including automated insulin dosing systems, for the purpose of managing glucose (1).

*Sensor issues:* adhesion, skin reactions and the need for calibration can affect user experience.

*Data gaps:* FGM requires active scanning (every 8 hours) to retrieve full glucose data, leading to potential gaps. CGM systems may experience signal interruptions due to connectivity issues.

*Cost and accessibility:* both systems are more expensive than capillary blood glucose monitoring, which can limit access for some patients.

*Alarm fatigue:* frequent alerts with CGM use can lead to desensitisation, diabetes distress and deactivation of alarms.

## Insulin delivery systems

There are different ways of delivering intensive insulin therapy, including syringes and vials, insulin pens, and continuous subcutaneous insulin infusion (CSII), also known as insulin pumps. Advanced insulin delivery hardware, including insulin pumps and connected insulin pens offer people with diabetes effective, flexible solutions for insulin administration.

### *Functionality of connected insulin pens*

Connected insulin pens:

1. NovoPen® 6 and NovoPen Echo® Plus from Novo Nordisk: these pens integrate with the FreeStyle LibreLink app.
2. Medtronic InPen™: this pen pairs with the mobile app InPen™ (available for both iOS and Android) to provide real-time data on insulin doses, as well as reminders, bolus calculators and tracking of insulin usage. It works with or without a CGM (Simplera™).

### *Functionality of insulin pumps*

There are two types of insulin pump: (1) those connected to the body with tubing, and (2) tubeless devices. Both types consist of a pump, an insulin reservoir and an infusion set (subcutaneous catheter).

Conventional pumps are connected to the body with tubing and use subcutaneous catheters that require regular replacement (2 to 7 days depending on the type), while patch pumps adhere directly to the skin with built-in reservoirs and a retractable needle for inserting the catheter.

Insulin pumps deliver rapid or ultrarapid insulin at preprogrammed basal rates, supplemented by boluses for meals or the correction of hyperglycaemia. Basal rates can be customised to suit daily patterns, weekend activities or specific conditions such as menstruation, and temporary basal rates can address insulin needs during exercise, stress or illness.

Advanced features include various bolus types for matching meal composition and integrated bolus calculators to determine precise insulin doses based on current glucose levels and carbohydrate intake. Insulin pumps can be coupled with a CGM and offer improved insulin delivery assistance.

*Sensor-Augmented Pumps (SAP):* These systems display CGM data, allowing manual insulin adjustments or automatic insulin suspension on reaching the hypoglycaemic threshold or before hypoglycaemia events (Low Glucose Suspend [LGS] and Predictive Low Glucose Suspend [PLGS] algorithms).

*Automated Insulin Delivery (AID) systems:* These devices combine a pump, a CGM system and an algorithm to dynamically and automatically adjust insulin delivery based on glucose trends and algorithms such as Proportional Integral Derivative (PID), Model Predictive Control (MPC) or Fuzzy Logic (FL). Current algorithms are named hybrid or semi-automatic because they require the user to manually inform the system during meals and exercise.

*Open-source AID systems:* These tools form alternatives to commercial AID systems and have been shared freely since February 2015. They are created and supported by online communities of individuals affected by diabetes. Despite lacking regulatory approval and professional guidance, they are widely used worldwide, by adults and children/adolescents.

The glycaemic benefits of using AID systems are undeniable and observed in all people living with type 1 diabetes, independently of their age, social status or educational level in people enrolled in clinical trials. Therefore, AID can

**Table 2:**
List of Continuous Glucose Monitoring (CGM) systems available on the Swiss market.

| Company | Continuous Glucose Monitoring (CGM) system | Mobile app | Professional account | Operating system |
|---|---|---|---|---|
| Abbott | FreeStyle Libre 2 and Plus; FreeStyle Libre 3 and Plus | FreeStyle LibreLink; FreeStyle Libre 3; LibreLinkUp (follow) | LibreView | iOS, Android |
| Ascencia | Eversense® | Eversense® app | | iOS, Android |
| Dexcom | Dexcom G6®;Dexcom G7® | Dexcom G6® + Dexcom follow; Dexcom G7® + Dexcom follow; Dexcom Clarity | Clarity (software) | iOS, Android |
| Medtronic | Simplera™(not compatible with the Medtronic pump) | Medtronic CareLink Mobile; MiniMed™ Mobile; Guardian App | CareLink (software) | iOS, Android |
| Roche | Accu-Chek® SmartGuide | Accu-Chek® SmartGuide | Accu-Chek® Care | iOS, Android |

already be considered the standard of care for all people with type 1 diabetes and probably for other types of diabetes mellitus. Individuals should be informed about the existence of AID systems and receive appropriate support to be able to integrate them into their life. Future research and clinical data will lead to a better understanding of the efficiency of AID systems in people underrepresented in clinical trials.

### Open-source Automated Insulin Delivery (AID) systems

Currently, commercial AID systems are limited to specific pump and sensor combinations. Additionally, they impose restrictions on adjustable variables, such as target glucose levels and insulin absorption models. Moreover, despite significant research and commercial advancements, the lengthy and complex development and approval processes have led to the creation and support of open-source automated insulin delivery systems by online communities directly affected by diabetes.

The available open-source AID systems are:

– OpenAPS: runs the oref0/oref1 algorithm on a Linux-based mini-computer.

– AndroidAPS: executes the oref0/oref1 algorithm on Android devices.

– FreeAPS X and Trio: implements the oref0/oref1 algorithm on iOS devices.

– Loop: uses the Loop algorithm on iOS devices.

AndroidAPS and Loop became available in 2015, before the first approval of a commercial AID system by the US FDA in 2016. These systems offer flexibility and customisation for users who may prefer or require interoperability not provided by current commercial options. They also enable specific functionalities such as real-time data sharing, smartwatch integration as user interfaces and remote-control capabilities – features that are particularly valuable for caregivers.

The algorithms used in open-source AID systems have undergone in silico testing with the UVA/Padova Type 1 Diabetes Simulator under various conditions (e.g. bolus overestimation and underestimation, anticipated and delayed bolus) and with different glycaemic target settings and algorithm features enabled (e.g. advanced meal assist, microboluses) [7]. These in silico studies suggest that open-source AID systems are safe and effective for glycaemic management in most predictable settings. Real-world observational data further supports their effectiveness and safety [8, 9]. Moreover, a randomised controlled trial (RCT) demonstrated that open-source AID increased time-in-range compared to sensor-augmented pump therapy over 24 weeks in both adults and children [10]. Further clinical trials are evaluating open-source AID algorithms that have been integrated into commercial product developments with the goal of obtaining regulatory approval [11].

Unquestionably, creating, implementing and managing an open-source AID system may require more time, cognitive effort and social resources compared to commercial options, and this potential challenge should be discussed with users.

Unlike commercial AID systems, open-source solutions do not have regulatory approval, official onboarding programmes (i.e. manufacturer-provided educational programmes) or a dedicated customer support helpline. Updates must be manually performed by the user. Nevertheless, despite the lack of formal company-led training, various online resources are available to assist with system setup and use. Additionally, peer-support networks exist through social media channels and local meetings. All data from open-source AID systems can be instantly shared with healthcare professionals via Nightscout or Tidepool. Alternatively, data from certain CGM devices and insulin pumps can be extracted using manufacturer-provided software. Healthcare professionals should be aware that some data systems may not comply with local data protection regulations. *Regulatory approval processes and potential legal implications for healthcare professionals supporting unregulated systems vary significantly across different countries and regions, and there is currently no Swiss position statement.*

In conclusion, while we do not advocate for open-source AID systems over commercial options, strong ethical arguments support their use, given the safety and effectiveness data from real-world evidence and RCTs. The individual's best interests must be balanced against the risks associated with open-source AID systems.

**Table 3:**
List of available advanced insulin delivery hardware.

| Company / device | Insulin pump | Automated Insulin Delivery (AID) system | Connected pen |
|---|---|---|---|
| Insulet | Omnipod DASH®; Omnipod® 5 | Omnipod® 5 (2025) | None |
| Medtronic | MiniMed™ 670 G; MiniMed™ 740 G; MiniMed™ 780 G | MiniMed™ 780 G with active SmartGuard | InPen™ |
| Medtrum | TouchCare® Nano pump | *TouchCare ® Nano CGM; EasyPatch ® App* | None |
| NovoNordisk | | | EchoPen® 6; NovoPen® 5 |
| Roche | Accu-Chek® Insight and Accu-Chek® Combo; *no longer marketed, respectively, by the end of March 2025 and by the end of 2026.* – Accu-Chek® Solo (supply and pumps available for existing customers only; not for new customers). | Diabeloop (with Insight pump); *no longer marketed by the end of March 2025, all supply will be withdrawn from the market by the end of 2025* | None |
| Tandem | t:slim X2 | Control IQ | None |
| Ypsomed | YpsoPump® | CamAPS FX | None |

### Data management software

Available platforms and software:

- Platforms that integrate data from multiple diabetes devices: Glooko, Diasend (now Glooko), Diabass, MyLife Software, SiDiary, Glucodiary.
- Open-source platforms popular among users of DIY systems: Tidepool and Nightscout.
- Proprietary platforms integrating data from specific devices: CareLink (Medtronic), LibreView and Auto Assist Neo (Abbott), Yourloops (Diabeloop), Clarity (Dexcom), Accu-Chek Connect and Accu-Chek Smart Pix Software (Roche Diabetes Care), GlucoContro.online (Ascensia), GlucoMemory (Beurer).

Validated applications available in Switzerland:

- Swiss Diabetes Guide: provides therapy recommendations based on guidelines of the Swiss Society for Endocrinology and Diabetology (SSED). It includes tools like an HbA1c calculator and personalised therapy suggestions for healthcare providers (https://www.swissdiabetesguide.ch/en).
- Proprietary apps: MySugr App, My Life App, Contour® Diabetes App, One Touch Reveal App.

## Reimbursement for diabetes technology in Switzerland

Diabetes and Technology reimbursement in Switzerland is accessible, considering that most available devices are covered. Three key points deserve particular attention: (1) the Federal Office of Public Health (BAG, OFSP, UFSP) maintains a list of approved devices and their reimbursement criteria under the Swiss healthcare system; (2) insurance policies may differ slightly between providers, especially for supplementary coverage beyond the mandatory insurance (OKP, AOS, AOMS); (3) prices might vary as many companies offer discounts to clinics, health insurances or pharmacies. Pharmacies can legally add a surcharge to the official price of consumables (List of Remedies and Equipment [Mittel und Gegenständeliste, MiGeL / Liste des moyens et appareils, LiMA / Elenco dei mezzi e degli apparecchi, EMAp]).

### Process of reimbursement in patients with diabetes

- Prescription: devices and consumables must be prescribed by a physician with a specialisation in Endocrinology/Diabetology.
- Cost approval: insurance companies often require prior approval (guarantee of cost coverage), including documentation of the medical necessity.
- Reimbursement: once approved, the costs are reimbursed either fully or with co-payment by the patient (depending on the patient's individual insurance plan).

### Continuous Glucose Monitoring (CGM) systems

CGM systems consist of a sensor, a transmitter and a data display device, which can also take the form of a mobile application on a personal smartphone. For some devices, the sensor and the transmitter are two distinct components while others integrate all in one.

*CGM systems with alarm function*

*Position number:* 21.05

*Limitatio:*

Under insulin therapy.

Prescribed through a physician with a specialisation in Endocrinology/Diabetology or a paediatrician with subspecialty in Endocrinology and Diabetology.

One of the following criteria:

- HbA1c above 8.0% (at initiation, despite the fact that this is not specified in the List of Remedies and Equipment).
- Hypoglycaemia grade II or III.
- Brittle diabetes with previous emergency consultations or hospitalisations.

Guarantee of cost coverage needs to be resubmitted to the health insurance every year.

*CGM/FGM systems with pre-calibrated sensors and value query*

*Position number:*21.06

*Limitatio:*

Persons with intensified insulin therapy (including insulin pump therapy)

**Table 4:**
List of available platforms and software available on the Swiss market.

| Company / device | App | Professional account | Available for operating system |
|---|---|---|---|
| Abbott | FreeStyle Libre 2; FreeStyle Libre 3 and Plus; LibreLink | LibreView | iOS, Android |
| Ascencia | Eversense app; Contour Diabetes App | Eversense DMS Pro; Glooko | iOS, Android |
| Dexcom | Dexcom G6; Dexcom G7; Clarity (software) | Glooko; Tidepool | iOS, Android |
| Insulet | | Glooko, Tidepool | |
| Medtronic | Medtronic CareLink Mobile; Minimed Mobile; Guardian App | CareLink (software) | iOS, Android |
| Medtrum | EasyPatch; EasyTouch | EasyView pro | iOS, Android |
| Roche | mySugr; Accu-Chek care | Accu-Chek Smartpix 2; Your loops | iOS, Android |
| Tandem | | Glooko; Tidepool | |
| Ypsomed | Ypsomed Mylife App | Mylife Software; Glooko; Tidepool | Android and iOS by mid 2025 |

DMS: diabetes self-management.

Prescribed through a physician with a specialisation in Endocrinology/Diabetology

### Insulin pump systems

Insulin pumps are medical devices that deliver insulin continuously through a subcutaneous catheter. There are two types of insulin pump: (1) those connected to the body with tubing, and 2) tubeless devices.

*Position number:* 03.02.01.00.2

*Limitatio:*

Labile diabetes or insufficient glucose control with multiple daily injections

Indication and care through a specialised centre with at least 1 physician with a specialisation in Diabetology/Endocrinology

*Material: general information*

Rental:

- Maintenance and service and emergency pump delivery in Switzerland are typically included
- CHF 10.11 per day covered by insurance
- Most companies offer a package covering the daily rental and all consumables needed for CHF 10.11

Purchasing a pump is rare but possible:

- Insurance coverage for purchase might require additional justification. The manufacturer's warranty generally lasts a maximum of 2 years.

Actual costs for insulin pump users are in most cases higher than reimbursed costs, due to the need to purchase additional consumables.

## Therapy goals aligned with technology

Continuous Glucose Monitoring (CGM) has revolutionised diabetes management by offering detailed insights into daily glucose patterns. Modern guidelines from the European Association for the Study of Diabetes (EASD), the American Diabetes Association (ADA) and the International Society for Pediatric and Adolescent Diabetes (ISPAD) increasingly focus on four specific CGM metrics – Time In Range (TIR), Time In Tight Range (TITR), Time Below Range (TBR) and Time Above Range (TAR) – to guide therapeutic decisions [6]. In Switzerland, these para-

**Table 5:**
Cost coverage of Continuous Glucose Monitoring (CGM) devices with alarm.

| Device | List of Remedies and Equipment position number | Daily coverage by insurance (CHF) | Maximal annual coverage (CHF) |
|---|---|---|---|
| Transmitter | 21.05.01.00.2 | 2.66 | 970.90 |
| Sensor (single-use sensor + insertion set) | 21.05.02.00.3 | 11.74 | 4285.10 |
| Monitor* | 21.05.02.03.3 | 1.91 | 697.15 |

* Only paid if monitor is part of the original CGM system.

**Table 6:**
Continuous Glucose Monitoring (CGM) devices available in Switzerland.

| Company | Product | Daily costs transmitter (CHF) | Daily costs sensor (CHF) | Daily costs receiver (CHF) | Annual costs for constant use (CHF) |
|---|---|---|---|---|---|
| Dexcom | Dexcom G6® | 2.40 | 9.07 | 1.37* | 4686.60 |
| | | | | | 4186.55* |
| Medtronic | Simplera™ and Simplera Sync™** | 11.74 (all in one) | | | 4285.10 |
| Medtronic | Guardian Sensor 4 | 14.40 (transmitter + sensor) | | | 5265.00 |
| Senseonics | Eversense® E3 | 2.65*** | 8.56**** | | 4683.00**** |

* Optimal, mobile application can be used as well with subsequent reduction in costs.

** Simplera™ is coupled with the InPen™ System and Simplera Sync™ with the Medtronic pump.

*** One transmitter needed per year: 1 transmitter costs CHF 967.00.

**** Procedure costs in addition: medical (TARMED) CHF 250.00 + insertion kit CHF 47.50 (2×/year)

**Table 7:**
Cost coverage of Continuous Glucose Monitoring (CGM) / Flash Glucose Monitoring (FGM) devices in Switzerland.

| Subject | Position number | Daily coverage by insurance (CHF) | Maximal annual coverage for constant use (CHF) |
|---|---|---|---|
| Sensor (single-use sensor + insertion set) | 21.06.02.00.1 | 4.85 | 1770.25 |
| Monitor* | 21.06.01.00.1 | 0.09* | 164.25 |

* CHF 65.54 covered every 2 years by insurance.

**Table 8:**
Available Continuous Glucose Monitoring (CGM) / Flash Glucose Monitoring (FGM) devices in Switzerland.

| Company | Product | Daily costs transmitter + sensor (all in one) (CHF) | Cost receiver (CHF) | Annual costs for constant use (CHF) |
|---|---|---|---|---|
| Abbott Diabetes Care | FreeStyle Libre 2 Plus | 4.85 | 72.75 | 1770.25 |
| Abbott Diabetes Care | FreeStyle Libre 3 Plus | 4.85 | 72.75 | 1770.25 |
| Dexcom | Dexcom G7® | 4.85 | 63.50 | 1770.30 |
| Roche | Accu-Chek SmartGuide | 4.52 | 63.22 | 1770.20 |

meters form the cornerstone of updated recommendations for adults with diabetes.

### Time In Range and CGM metrics

TIR is the percentage of CGM readings that fall between 3.9 and 10.0 mmol/l. Multiple consensus statements suggest targeting a TIR above 70% to lower the risk of diabetes-related complications [1, 12, 13]. Although HbA1c remains a critical tool for long-term monitoring, TIR uncovers nuances by revealing fluctuations that are masked by an average value. Clinicians and diabetes teams can use TIR to tailor interventions in real time, adjusting insulin doses, meal plans and lifestyle measures to maintain stability within the recommended interval.

TITR narrows the acceptable glucose window to 3.9–7.8 mmol/l. Historically, TITR targets around 50–60% were considered achievable for motivated individuals capable of frequent glucose checks and rapid therapy adjustments [13, 14]. Recent advances, including AID systems and enhanced CGM technology, have made TITR goals exceeding 70% attainable in select groups [15]. These higher TITR values may confer added benefits in mitigating glycaemic variability and reducing longer-term complications, but they require vigilant monitoring to limit the risk of hypoglycaemia.

TBR is the proportion of CGM values below 3.9 mmol/l. Most guidelines advise keeping total TBR under 4% of daily readings [13, 16]. Within TBR, readings below 3.0 mmol/l signify clinically significant hypoglycaemia, and many authorities propose restricting this subset to 1–2% or less of CGM data [15]. Prioritising hypoglycaemia prevention is crucial, as recurrent low-glucose episodes can precipitate acute events such as arrhythmias or accidents, and they can erode patients' confidence in diabetes self-management. CGM alerts and patient education on trend interpretation help avert dangerous hypoglycaemias.

TAR is the proportion of glucose readings exceeding 10.0 mmol/l. Recommended thresholds aim to keep TAR below 25%, with no more than 5% of CGM values surpassing 13.9 mmol/l [12, 13]. Extended periods of hyperglycaemia heighten the risk of microvascular and macrovascular damage, underscoring the need for diligent insulin titration, attention to dietary factors and, where relevant, optimisation of adjunctive glucose-lowering medications.

### CGM metrics and outcomes

AID systems leverage CGM data to modulate insulin delivery continuously. Clinical evidence indicates that these automated approaches can raise TIR by 15–20 percentage points while lowering both TBR and TAR [6]. Algorithms within AID systems adapt insulin infusion rates in response to real-time sensor glucose readings, reducing the burden on patients to make frequent dosing decisions. For individuals who do not use pumps, smart insulin pens and connected glucometers still provide actionable data [2, 17]. By logging insulin dosages and glucose measurements in a centralised platform, these devices enable clinicians to assess adherence and promptly modify therapy plans to maintain glucose levels within target ranges.

In older adults or those with significant comorbidities, hypoglycaemia can precipitate serious complications, including falls and cognitive impairment [13, 18]. These recommendations acknowledge that slightly relaxed targets for TIR or TITR may be justified to prioritise safety. Nonetheless, CGM parameters remain essential for identifying problematic glucose excursions and customising interventions. Adjusting target thresholds does not diminish the value of granular CGM data in guiding insulin adjustments, meal planning and monitoring strategies.

Healthcare teams should systematically check TIR, TITR, TBR and TAR in routine practice to assess treatment efficacy and intervene proactively. Emphasis on restricting total TBR to under 4% – with readings below 3.0 mmol/l held to 1–2% or less – minimises severe hypoglycaemia risk. Concurrently, sustaining TIR above 70% and, where feasible, pursuing TITR beyond 50–60% (or even above 70%) reduces glycaemic variability and potential complications. Through integrated use of insulin pump technology, smart pens, dietary education and real-time data analysis, clinicians can advance safer, more individualised dia-

**Table 9:**
Insulin pumps available in Switzerland.

| Company | Product | Daily costs (CHF) | Daily costs of consumables (CHF) | Costs per year (CHF) + additional costs |
|---|---|---|---|---|
| Insulet | Omnipod DASH® | 11.66* | | 3690.15 + 565.75 not covered + 199.20 cost of Personal Diabetes Manager at initiation** |
| | Omnipod® 5 | 11.63 or 12.49* | | 564.45 not covered + 199.20 cost of Personal Diabetes Manager at initiation |
| Medtronic | MiniMed™ 740 G | 10.07 | Included in daily pump costs | 3675.55 |
| Medtronic | MiniMed™ 780 G | 10.11 | Included in daily pump costs | 3690.15 |
| Medtrum | TouchCare® Nano Pump | | | Not available |
| Tandem Diabetes Care | t:slim pump | 3.66 | 6.44 | 3686.50 |
| Ypsomed | myLife YpsoPump® | 4.83*** | Infusion set with steel catheter: 5.40****; Infusion set with soft catheter: 5.30***** | 3675.60; Insulin Reservoir (160 IU): if needed, 4.30 per piece |

* 1 box lasts for 30 days and costs CHF 350.00. For Omnipod® 5: 1 individual box costs CHF 380.10 and when 3 boxes are ordered, costs fall to CHF 354.55.

** Although Personal Diabetes Manager is needed to run the system, its costs are not included (a second Personal Diabetes Manager can be purchased for CHF 160.15).

*** CHF 145 per month.

**** Orbit micro, 10 pieces, CHF 108.00.

***** Orbit soft, 10 pieces, CHF 159.00.

betes management for adults across diverse clinical contexts.

## Technology during pregnancy and pre-existing diabetes or gestational diabetes

The prevalence of diabetes during pregnancy has been increasing in parallel with the worldwide epidemic of obesity. Not only is the prevalence of type 1 and type 2 diabetes increasing in individuals of reproductive age, but there is also a dramatic increase in the reported rates of gestational diabetes mellitus. Diabetes confers significantly greater maternal and foetal risks largely related to the degree of hyperglycaemia but also related to chronic complications and comorbidities of diabetes. In general, specific risks of diabetes in pregnancy include, among others, spontaneous abortion, foetal anomalies, preeclampsia, foetal death, macrosomia, neonatal hypoglycaemia, neonatal hyperbilirubinaemia and neonatal respiratory distress syndrome. In addition, diabetes in pregnancy increases the risks of obesity, hypertension and type 2 diabetes in the offspring later in life [19–21].

### Physiological changes during pregnancy

Early pregnancy is a period of enhanced insulin sensitivity and lower glucose levels, and many women with type 1 diabetes will have lower insulin requirements and an increased risk for hypoglycaemia [22]. At around 16 weeks, insulin resistance begins to increase and total daily insulin doses increase up to ~5% per week through week 36. This usually results in a doubling of the daily insulin dose compared with the pre-pregnancy requirement. While there is an increase in both basal and bolus insulin requirements, bolus insulin requirements take up a larger proportion of overall total daily insulin needs in women with preexisting diabetes as pregnancy progresses [23]. The insulin requirements level off towards the end of the third trimester. A rapid reduction in insulin requirements could indicate the development of placental insufficiency [24]. In people with normal pancreatic function, insulin production is sufficient to meet the challenge of this physiological insulin resistance and to maintain normal glucose levels. However, in women with diabetes and gestational diabetes, hyperglycaemia occurs if treatment is not adjusted appropriately.

### Glucose monitoring during pregnancy

Reflecting this physiology, fasting and postprandial blood glucose monitoring is recommended to achieve metabolic control in pregnant women with diabetes or gestational diabetes. Preprandial testing can be recommended when using insulin pumps or basal-bolus therapy, particularly in women with pre-existing diabetes, so that the premeal rapid-acting insulin dosage can be adjusted. Postprandial monitoring is associated with better glycaemic outcomes and a lower risk of preeclampsia [24–26]. The internationally recommended targets for blood glucose levels for pregnant women with type 1 or type 2 diabetes are as follows:

- Fasting glucose 3.9–5.3 mmol/l *and either*
- 1-hour postprandial glucose 6.1–7.8 mmol/l *or*
- 2-hour postprandial glucose 5.6–6.7 mmol/l.

Lower limits are based on the mean of normal blood glucose in pregnancy [27].

Observational studies in preexisting diabetes and pregnancy show the lowest rates of adverse foetal outcomes in association with HbA1c <6–6.5% (<42–48 mmol/mol) early in gestation [28, 29].

#### *Continuous Glucose Monitoring in pregnancy*

The Continuous Glucose Monitoring in Women with Type 1 Diabetes in Pregnancy Trial (CONCEPTT) was a randomised controlled trial of real-time CGM in addition to standard care, including optimisation of pre- and postprandial glucose goals versus standard care for pregnant women with type 1 diabetes. It demonstrated the value of real-time CGM in pregnancy complicated by type 1 diabetes by showing a mild improvement in HbA1c and a significant improvement in the maternal glucose TIR, without an increase in hypoglycaemia, and reductions in Large for Gestational Age births, length of infant hospital stays and severe neonatal hypoglycaemia [30]. An observational cohort study that evaluated the glycaemic variables reported using CGM systems found that lower mean glucose, lower standard deviation and a higher percentage of TIR were associated with lower risks of Large for Gestational Age births and other adverse neonatal outcomes [31]. Data from one study suggests that, primarily due to pregnancy-related changes in HbA1c, CGM-derived mean glucose is not a valuable indicator to estimated HbA1c [32], and therefore the Glucose Management Indicator (GMI) should not be used. TIR and TAR offer better predictive values in pregnant women and should be followed to assess glycaemic management [33].

An analysis of >10.5 million CGM glucose measurements from 386 pregnant women with type 1 diabetes from two international multicentre studies was performed. CGM glucose metrics and 24 h glucose profiles were calculated for each gestational week, and the relationship to normal (10–90$^{th}$ percentile) and Large (>90$^{th}$ percentile) for Gestational Age birthweight infants was determined. Mean CGM glucose concentration fell, and percentage of time spent in the pregnancy target range of 3.5–7.8 mmol/l increased in the first 10 weeks of pregnancy and plateaued until 28 weeks of gestation, before further improvement in mean glucose and percentage of TIR until delivery. Maternal CGM glucose metrics diverged at 10 weeks of gestation, with a significantly lower mean CGM glucose concentration (7.1 mmol/l vs 7.5 mmol/l) and a higher percentage of TIR (55% vs 50%) in women who had normal versus Large for Gestational Age infants. The 24 h glucose profiles were significantly higher across the day from 10 weeks of gestation in Large for Gestational Age births. Normal birthweight is associated with achieving significantly lower mean CGM glucose concentrations across the 24 h day and higher CGM TIR from before the end of the first trimester, emphasising the need for a shift in clinical management, with increased focus on using weekly CGM glucose targets for optimising maternal glycaemia from early pregnancy [34].

CGM TIR can be used for assessment of glycaemic outcomes in people with type 1 diabetes, but it does not provide actionable data to address fasting and postprandial hypoglycaemia or hyperglycaemia. The cost of CGM in

pregnancies complicated by type 1 diabetes is offset by improved maternal and neonatal outcomes [35]. The decision of whether to use CGM in pregnant women with type 2 or gestational diabetes mellitus should be individualised based on treatment regimen, circumstances, preferences and needs.

The international consensus on TIR [36] endorses pregnancy target ranges and goals for TIR for women with type 1 diabetes using CGM as reported on the ambulatory glucose profile; however, it does not specify the type or accuracy of the device or need for alarms and alerts. Selection of the CGM device should be based on an individual's circumstances, preferences and needs.

- Target sensor glucose range 3.5–7.8 mmol/l: TIR, goal >70%.
- Time below range <3.5 mmol/l: level 1 TBR, goal <4%.
- Time below range <3.0 mmol/l: level 2 TBR, goal <1%.
- Time above range >7.8 mmol/l: TAR, goal <25%.

The international consensus on TIR endorsed the same sensor glucose target ranges for women with type 2 diabetes in pregnancy and gestational diabetes mellitus, and the TIR goal should be higher (%), with the same goals TBR <4% and TAR <25%.

### Automated Insulin Delivery (AID) systems during the pregnancy period

While many healthcare professionals would recommend insulin pumps in women with type 1 diabetes during the preconception period, it was not clear until very recently that the use of pumps is superior to multiple daily injections. Actually, only a minority of current AID systems have validated algorithms for achieving pregnancy goals.

Assessments of pregnant women with type 1 diabetes for AID initiation should include relevant parameters such as glycaemic levels, presence or absence of severe hypoglycaemic or hyperglycaemic events, ability or comfort in engaging with diabetes technology, psychosocial determinants, cost, individual preference and other factors as relevant. In addition, individuals who use AID systems that do not have pregnancy-specific glucose targets often benefit from supportive techniques for pump management as determined by expert guidance from an experienced interprofessional team. AiDAPT was a multicentre parallel-group randomised trial with 124 participants, aged 31 years with type 1 diabetes duration of 17 years and an HbA1c of 7.7%, treated with myLife CamAPS FX insulin pump with CGM system vs insulin treatment and CGM system. The primary outcome was TIR 3.5–7.8 mmol/l. This outcome was accomplished with a 20% increase in TIR from 55.6% to 68.2% and an improvement in the HbA1c from 6.0% to 6.4%. This trial demonstrated significantly better glycaemic control from the beginning of pregnancy, gestational age 8–12 weeks, and up to 36–40 weeks [37].

The Closed-loop Insulin Delivery in Pregnant Women With Type 1 Diabetes (CRISTAL) trial in 95 pregnant women with type 1 diabetes and an HbA1c of 6.5% compared tighter glycaemic control with AID vs conventional insulin treatment. AID therapy did not improve overall TIR but improved overnight TIR, reduced TBR and improved treatment satisfaction. This data suggests that the MiniMed™ 780G could be used in pregnancy and provides some additional benefits compared with standard insulin therapy; thus, it may be appropriate to continue or initiate AID therapy with systems that do not have pregnancy-specific glucose targets or algorithms in carefully selected pregnant women with type 1 diabetes, and with expert guidance [38].

### Conclusion and future developments

Optimising glycaemic control in women with gestational diabetes mellitus or type 1 and type 2 diabetes during pregnancy is challenging. Achieving and maintaining strict glycaemic targets is crucial for reducing pregnancy-related complications. Therefore, continuing or initiating CGM, even in gestational diabetes mellitus or type 2 diabetes, can significantly enhance therapeutic decision-making. Women with type 1 diabetes who are planning to conceive (preconception time) or who are already pregnant should receive counselling on initiating and continuing an AID system throughout pregnancy. In addition, they should have more frequent follow-ups – at least monthly – using telehealth or telephone consultations to optimise glycaemic control and promptly address any concerns.

There is an increased hypoglycaemia rate early in pregnancy due to a higher insulin sensitivity, followed by an increasing insulin resistance from mid-pregnancy with delayed insulin action with advancing gestation. Therefore, in women treated with multiple daily injections or an insulin pump, a decrease of the insulin rate in the first trimester by 15–20% is required and for those using an AID system the glycaemic target and the carbohydrate ratio need to be adapted. From week 16 onwards, the total insulin dose needs to be increased by about 5% every week except for women using AID systems.

AID systems automatically adapt insulin delivery. Women should be supervised to adjust carbohydrate factors and to anticipate bolus timing, which is typically done 15–30 minutes before meals in the first trimester, extending up to one hour as gestation progresses. While myLife CamAPS FX (YpsoPump®) is approved for use in Europe, all other AID systems currently remain off-label for the management of diabetes in pregnancy.

Further studies on AID system therapy in pregnancy are needed to optimise glycaemic control during pregnancy, reduce patient burden and support healthcare providers at all levels. In case of pump failure, a written emergency procedure should be available, given that the occurrence of ketoacidosis could potentially be very harmful to both mother and baby. Follow-up visits by smartphone and telemonitoring are also very helpful and should be considered when possible.

## Use of technology in children and adolescents

Despite the increasing use of diabetes technologies and a steady improvement in mean HbA1c in recent decades as shown by registry data, only a minority of young people with type 1 diabetes achieve the current blood glucose targets [39]. The use of advanced technologies is considered an opportunity to improve the current situation.

In Switzerland, internationally accepted and regularly updated therapeutic targets and diabetes technology recom-

mendations are used in clinical practice. These clinical practice guidelines are endorsed by the Swiss Society of Paediatric Endocrinology and Diabetology (SSPED).

### Glycaemic targets

Glycaemic targets outlined in the ISPAD 2024 Clinical Practice Consensus Guidelines [40]:

*HbA1c for youth with diabetes:*

6.5% (<48 mmol/mol) for:

– Young people with access to advanced technology (CGM and AID system) and/or where the pursuit of the lower target does not add burden such that quality of life is impacted.

<7.0% (<53 mmol/mol) in all other scenarios.

*CGM users:*

– In parallel, a TIR >70% over a period of 14 days is targeted.
– Further recommended percentages of time spent in each glycaemic range are outlined in published standards [41].
– Potential metrics (requires additional validation) for AID users: TITR >50% recorded over a 14-day period.

As in adults, the current use of technology for managing type 1 diabetes in children and adolescents has been revolutionised by the recent advances in CGM, insulin pumps and AID systems, and their role in improving glycaemic control and quality of life in young people with type 1 diabetes is evident [42].

There are several multilevel critical challenges to using modern diabetes technology in children and adolescents. Key considerations include:

*At the level of the individual (child):*

– Physiological: growth and development, puberty, body surface area, metabolism, nutrition, physical activity.
– Psychological factors: psychomotor development, emerging identity, body image, adaptation/coping with a chronic condition.
– Societal factors.

*At the healthcare system level:*

– Insurance coverage, school, transition from paediatric to adult-orientated care.

All these factors present potential barriers to the use of modern diabetes technologies in youth that need to be addressed by specialised paediatric diabetes centres.

### Specific challenges and needs of different age groups regarding technology use

*Toddlers and preschoolers up to the age of 6 years:*

– Low insulin requirements: small increments in insulin dosing needed.
– Lack of/ limited regulatory approval of AID systems in very young children less than 2 years of age or up to the age of >6 years depending on the manufacturer.
– Optimal glycaemic control: early-onset diabetes is associated with a high lifetime risk of diabetes complications.
– Small bodies need adapted tools.
– Management primarily through parents/caregivers.
– Food: unpredictable eating behaviours (including breastfeeding).
– Physical activity / emotions: unpredictable metabolic reactions.

*Schoolchildren (6–12 years):*

– Management at school.
– Safety measurements.
– Beginning autonomy/self-management (insulin dosing).
– Adaptation/coping with a chronic condition.

*Adolescents (12–18 years):*

– Higher insulin needs when children go through puberty.
– Transition to autonomous diabetes management.
– Self-management.
– Changing priorities, risk-taking behaviour.
– Body image and acceptance.
– Adaptation/coping with a chronic condition.
– Consent for remote monitoring/data transfer of parents/caregivers.

### Diabetes and Technology indications in children and adolescents

International recommendations for technology use in children and adolescents with diabetes as outlined in the ISPAD 2024 Clinical Practice Consensus Guidelines are as follows:

*CGM use:*

Type 1 diabetes [43]:

– Strongly recommended in all children, adolescents and young adults with type 1 diabetes.
– Initiation: where available, in all young people with type 1 diabetes as soon as possible after diagnosis.
– Recommended tool for glycaemic monitoring in preschoolers below 6 years of age with type 1 diabetes [44].

Type 2 diabetes [45]:

– If treatment with insulin is required.
– When there are symptoms of hyper- or hypoglycaemia.

*Insulin delivery [46]:*

– Youth should be offered the most advanced insulin delivery technology that is available, accessible and appropriate for them.
– AID systems are strongly recommended for youth with diabetes.
– System choice should be based on individual needs and preferences.
– The insulin pump is the preferred method of insulin delivery in toddlers and preschoolers whenever available and affordable [44].

Approved CGM, insulin pumps and AID systems in Switzerland are detailed in the “List of available devices”section and in table S1A in the appendix. In Switzerland, CGM systems are approved from the age of 2 years or 4 years and onwards for children and adolescents, de-

pending on the system. Currently available insulin pump systems are approved for AID use from the age of 2, 6 or 7 years, depending on the insulin pump chosen (table S1B in the appendix). One system has regulatory approval from age 1 year and older; however its use is restricted by lack of regulatory approval for a corresponding CGM system.

### Specific paediatric diabetes and technology education

For children with diabetes, their families and other adults in charge of children with type 1 diabetes, it is critical that individuals are aware of changes in the child's health status (i.e. signs and symptoms of hypo- and hyperglycaemia) and have the skills and abilities to respond to glycaemic changes and avoid severe hypo- or hyperglycaemic events while using diabetes technology.

Specialised education, training and continuous support by paediatric diabetes centres to build the necessary knowledge, skills and confidence to use diabetes technology (CGM and AID systems), and to adapt to the changing metabolic needs of growing children is needed.

Children and adolescents with type 1 diabetes must be fully integrated in all school activities. Specific accommodations in schools to ensure their health and safety are needed. As such, and due to the lack of diabetes nurses in schools, specific attention should be given to diabetes education of school staff, particularly when using advanced technologies like CGM and AID systems for insulin administration [47, 48]. Key considerations include:

- Awareness and trained staff: training of teachers/other adult school staff is critical; if possible, include homecare nurses at after-school care facilities.
- Technology acceptance and integration.
- Access to Diabetes Management Supplies: CGM, insulin, snacks for hypoglycaemia management.
- Communication protocols: written individual care plans, emergency plans, regular communication with parents/caregivers.
- Physical activity: full participation, specific considerations when using an AID system.
- Allowance of technology: use of electronic devices as glucose monitoring devices.

### Data sharing vs data privacy in children and adolescents with type 1 diabetes

By using digital tools such as CGM systems, insulin pumps and mobile applications for type 1 diabetes management in children and adolescents, large volumes of health data are generated and shared via cloud-based solutions. While data sharing facilitates personalised care, real-time monitoring and research advancements, it raises significant concerns about data privacy and security.

Harmonising data sharing with stringent privacy protections is crucial to leverage digital advancements while safeguarding the rights and confidentiality of young patients with type 1 diabetes. Please also refer to the "Telemedicine and remote care" section.

## Diabetes technology in the elderly

People living with type 1 diabetes and aged over 65 years are considered elderly according to the American Diabetes Association guidelines [1]. The prevalence of elderly people with type 1 diabetes is increasing due to longer life expectancy [49], which presents new therapeutic challenges. Indeed, older people with type 1 diabetes are at higher risk of severe hypoglycaemia than younger individuals, and are exposed to several comorbidities such as cognitive impairment, dyspraxia and frailty that can have a negative impact on type 1 diabetes management. Furthermore, ageing is associated with changes in physical activity and appetite, two well-known factors affecting glucose variability.

Therefore, broader adoption of Diabetes and Technology and the retention of established technologies for older adults with type 1 diabetes appears of utmost importance, considering the benefits observed with the use of CGM and AID systems in young children, adolescents and adults.

To date, few studies have confirmed that CGM systems are effective in the elderly at reducing the number of hypoglycaemic episodes and attenuating glycaemic excursions [50]. No studies confirm that the use of Diabetes and Technology could improve quality of life or reduce frailty, hospitalisations and progression of cognitive decline. However, an Australian randomised cross-over trial has recently shown that 31 people with type 1 diabetes of over 30 years' duration and already using insulin pumps (Medtronic G670 + Guardian 3) derived a clear benefit from using a hybrid closed-loop algorithm (AID system) compared with sensor-augmented pumps therapy. The results showed significant improvements in TIR, from 69.0% to 75.2% (6.2 percentage points higher, 95% CI: 4.4–8.0; $p < 0.0001$), as well as a reduction in the TBR, while the occurrence of severe hypoglycaemia remained unchanged [51]. A similar study, involving 38 patients aged over 60 years and already on insulin pumps, was conducted in Austria with a different AID system (CamAPS with YpsoPump® + Dexcom G6® vs Diana Diabecare RS pump + Dexcom G6®) and produced very similar results [52].

Based on existing data and clinical experience, the use of technology such as AID systems in older people with type 1 diabetes already on pump therapy should be promoted. A CGM system should be offered to every older adult with type 1 diabetes willing to wear one, and the glycaemic targets should be adapted in case of existing frailty (TIR >50%, TBR <1%).

There are many challenges facing healthcare professionals in promoting efficient use of Diabetes and Technology in the elderly. First, older adults with diabetes mellitus at risk of high glucose variability and hypoglycaemia need to be better identified. Second, to benefit from the use of Diabetes and Technology, appropriate education is needed, involving relatives and caregivers inexperienced in diabetes mellitus management. Finally, given the diversity of medical situations associated with old age, there will never be a one-size-fits-all approach [53].

## Use of diabetes technology in people with type 2 diabetes

CGM and FGM have proven benefits for patients with type 1 and type 2 diabetes, particularly those on multiple dai-

ly injections. These technologies improve understanding of hypo- and hyperglycaemia, enhance therapeutic education and contribute to better glycaemic control, ultimately improving patients' quality of life.

Recent studies have shown that FGM can improve HbA1c by 0.28% to 0.9% in people with type 2 diabetes using multiple daily injections, compared to capillary blood glucose monitoring [54, 55]. Additionally, the 2021 MOBILE study revealed that CGM outperforms blood glucose measurements in people with type 2 diabetes on basal insulin alone, with a 15% TIR improvement after 8 months [56]. In a real-life study based on insurance datasets, CGM use reduced HbA1c by 1.1% and the risk of hypoglycaemia by 4% compared to BGSM. These benefits appear more pronounced in people with type 2 diabetes than those with type 1 diabetes [57].

Insulin pumps have been used for the treatment of people with type 1 diabetes for many years. Their use in people with type 2 diabetes who require insulin is less common, but is equally effective and safe. The 2014 OpT2mise study was the first randomised controlled trial to demonstrate that insulin pumps provide a significantly greater reduction in HbA1c (1.1%) compared to an intensified basal-bolus regimen (0.4%, $p < 0.0001$) in people with type 2 diabetes. Additionally, after six months, patients using insulin pumps required 25 fewer units of insulin per day than those under multiple daily injections ($p < 0.0001$), with no significant differences observed between the two groups in terms of weight, hypoglycaemia or diabetic ketoacidosis [58]. A similar benefit was observed in the 2020 VIVID trial, which focused on the use of insulin pumps delivering concentrated insulin (Humulin R U-500) in patients with significant insulin resistance. This trial further validated insulin pumps for this specific patient population and showed, again, reduced insulin requirements [59].

AID systems have also proven effective for people with type 2 diabetes. In one study using the myLife CamAPS FX system, the time spent in the target glucose range was 66.3% with Automode, compared to 32.3% with manual pump use (+35.3%, $p < 0.001$), without increasing the risk of hypoglycaemia [60]. Retrospective real-world data from people with type 2 diabetes using the t:slim X2 insulin pump system showed that those who transitioned to the Control IQ system showed an 8.1% improvement in Time in Range (3.9–10.0 mmol/l) compared to those using the pump without an AID system [17].

In addition to improving glycaemic control, insulin pumps offer benefits such as reducing the number of injections, providing discreet bolus administration during meals, managing the dawn phenomenon and adapting to irregular lifestyles for people with type 2 diabetes.

However, there are also challenges, as many older patients are less familiar with technology and the multitude of devices available on the Swiss market can further discourage older patients and caregivers from using these aids. Furthermore, the List of Remedies and Equipment requires that patients be followed by a specialist for reimbursement purposes.

Weight gain associated with intensified therapy remains a debated issue. The only absolute contraindication for insulin pump therapy is the presence of a severe psychiatric or neurocognitive disorder. Even for older patients with physical or cognitive limitations, the use of insulin pumps may still be a feasible option if they have assistance with device management.

In conclusion, insulin pump therapy is a viable and underutilised option for insulin-dependent people with type 2 diabetes. It should be considered more widely, particularly for patients who are poorly controlled despite optimal multiple daily injections. People with type 2 diabetes who struggle with injections or have a low quality of life due to multiple injections can experience improved satisfaction with insulin pump therapy. Ongoing advancements in diabetes technology are expected to make insulin pumps even more accessible and easier to use for these patients.

## Use of diabetes technology in "Other specific diabetes types"

Other specific forms of diabetes mellitus include several types of diabetes that are not type 1, type 2 or gestational diabetes mellitus [61]. Monogenic diabetes such as maturity-onset diabetes of the young (MODY), which encompasses genetic defects of beta-cell function and/or development, and diabetes related to disorders of the pancreas, also known as type 3c diabetes, are two forms of diabetes mellitus where Diabetes and Technology can be of greater support.

Type 3c diabetes is most often secondary to pancreatitis, pancreatic surgery or cystic fibrosis. This form of diabetes leads to brittle glycaemic control due to a loss of pancreatic cell functions and malabsorption, making hypoglycaemia management particularly challenging.

Studies collectively highlight the challenges related to type 3c diabetes management, emphasising the critical role of CGM and advanced therapeutic strategies. The findings underscore the limitations of capillary blood glucose monitoring, which often misses asymptomatic and nocturnal hypoglycaemia. CGM not only identifies more hypoglycaemic events but also provides detailed insights into glycaemic variability, aiding the development of personalised prevention strategies [62].

Regarding glycaemic variability, studies investigating different subtypes of pancreatogenic diabetes have reached inconclusive results, probably related to the small number of subjects studied (always under hundreds), the variability in study designs and the specific characteristics of the different subtypes of pancreatogenic diabetes.

A first study exploring glucose variability in fibrocalculous pancreatic diabetes and type 2 diabetes using CGM revealed that fibrocalculous pancreatic diabetes patients experienced significantly greater glycaemic variability than type 2 diabetes patients, with a mean amplitude of glycaemic excursion (MAGE) and a coefficient of variation (CV) markedly higher in fibrocalculous pancreatic diabetes. Postprandial glycaemic excursions were a major contributor to these differences, highlighting the unique challenges of managing fibrocalculous pancreatic diabetes [63, 64].

A further study explored glucose variability in 10 patients with diabetes resulting from total pancreatectomy using CGM, compared with type 1 diabetes and healthy controls, finding that pancreatectomy patients spent more time in

hyperglycaemia than the type 1 diabetes group, despite comparable HbA1c levels. However, the time spent below glucose target ranges and the coefficient of variation for plasma glucose were similar in totally pancreatectomised and type 1 diabetes patients. Healthy controls displayed significantly better glycaemia metrics [65].

Another study examined glycaemic variability in type 3c diabetes using CGM and compared it with that of type 1 and type 2 diabetes. Surprisingly, type 3c diabetes patients showed the lowest glucose variability (% coefficient of variation: 31.2%), compared to type 1 diabetes (38.6%) and type 2 diabetes (33.5%), contrary to the perception that type 3c diabetes is associated with a "brittle" condition. Despite lower glucose variability, type 3c diabetes participants had the highest mean glucose (11.6 mmol/l) and estimated HbA1c levels (8.2%), indicating challenges in achieving optimal glycaemic control. TIR was lower in type 3c diabetes (43%) than in type 2 diabetes (63%) and type 1 diabetes (55%) [66].

More recently, a study evaluating glycaemic control and insulin therapy in 93 patients following total pancreatectomy found that total pancreatectomy patients required lower daily insulin doses compared to type 1 diabetes (0.49 vs 0.65 units/kg/day). CGM showed similar glycaemic variability in total pancreatectomy and type 1 diabetes, but totally pancreatectomised patients benefited from tailored insulin regimens with lower basal insulin proportions [67].

Concerning insulin delivery systems, there are only a few published studies on the use of continuous subcutaneous insulin infusion / automated insulin delivery systems in this type of diabetes.Among them, a randomised clinical trial involving 2009 subjects assessed the efficacy of an AID system in managing glycaemic control post pancreatic resection. Thirty patients undergoing pancreatic surgery were divided into two groups: 17 used the STG-22 intravenous closed-loop system while 13 followed a standard sliding-scale insulin protocol. The authors concluded that AID systems offer superior glycaemic control compared to manual insulin regimens, particularly in high-risk patients with pancreatogenic diabetes after pancreatic resection. The results highlight the potential for AID systems to improve outcomes and reduce postoperative morbidity in patients undergoing pancreatic surgery[68].

Subsequently, several case reports were published confirming the ability of technology to control glycaemic variability and reduce complications, avoid severe hypoglycaemia and improve the quality of life for patients with pancreatogenic diabetes [69].

Overall, these findings illustrate the importance of CGM and innovative therapeutic approaches in addressing the complex glycaemic challenges associated with pancreatogenic and related diabetes types, paving the way for improved outcomes and personalised care.

However, managing pancreatogenic diabetes with technology support requires expert centres familiar with both the disease and the application of diabetes technologies. This will ensure that potential benefits are maximised and risks are minimised, enabling optimal outcomes and personalised care for these complex cases.

## Telemedicine and remote care

Telemedicine is a subsection of telehealth focused specifically on remote clinical care including diagnosis and treatment of conditions, and consultations through real-time communication [70].

In type 1 diabetes management, CGM plays an important role when providing remote diabetes care. It complements telemedicine consultations by providing real-time glucose data through connected devices and remote monitoring. If no HbA1c value can be obtained (e.g. in telemedicine), CGM-derived metrics such as the Glucose Management Indicator (GMI) can be considered as a standalone method for evaluating glycaemic outcomes [40].

In Switzerland, the integration of telemedicine and cloud-based health data sharing is governed by stringent data protection laws to ensure patient privacy and data security. Switzerland's data protection landscape is primarily shaped by the Federal Act on Data Protection (FADP), which underwent a comprehensive revision effective September 2023. The Federal Act on Data Protection mandates that the processing of personal data, especially sensitive health information, must adhere to principles of lawfulness, transparency and purpose limitation. Explicit consent from individuals is required for processing their health data.

### Benefits and challenges of telemedicine and remote care

*Benefits (modified from [71])*

Integration with advanced diabetes technology: Technologies such as manufacturer or data aggregator platforms allow for comprehensive data sharing between people with type 1 diabetes and healthcare professionals. By enabling real-time monitoring and analysis of glucose trends, these platforms help clinicians make informed decisions about treatment adjustments during remote consultations.

Potentially reduced travel burden: Time and cost savings for individuals with type 1 diabetes.

Increased contact with healthcare professionals and enhanced engagement: Supports treatment adherence and facilitates regular follow-ups [72, 73].

Satisfaction on both the individual and the healthcare professional level [74].

*Challenges (modified from [71])*

Data security and privacy: Ensuring the confidentiality and integrity of health data in cloud environments is paramount. Healthcare facilities must assess the security measures of cloud service providers and ensure compliance with the Federal Act on Data Protection.

Consent and trust: Obtaining informed consent for data processing and addressing concerns of people with type 1 diabetes about data privacy are critical.

Digital literacy and access: Individuals as well as healthcare professionals may face difficulties accessing and learning to use technological devices and software. Not all people with type 1 diabetes have access to the required digital infrastructure, including reliable internet connection or compatible devices, or sufficient digital literacy. Further-

more, some healthcare professionals face challenges integrating remote monitoring tools into their practices.

Interoperability of platforms and devices: Seamless data exchange is essential for effective diabetes management:

1. On a system level: Exchange between different telemedicine platforms and electronic health records.
2. At the individual level: Exchange between different device solutions platforms.

*Lack of standardisation can hinder data sharing and integration*

Economic challenges:

– Healthcare professionals are reimbursed for telemedicine consultations according to the position items in TARMED. This will be replaced by reimbursement via TARDOC beginning 2026 onwards. The current position items of TARMED cover the digital services incompletely and inadequately [75]. For example, TARMED currently does not provide incentives for the use of telemedicine [75, 76].
– CGM is reimbursed via List of Remedies and Equipment (MiGeL/LiMA/EMAp) for CGM. However, AID algorithms and other digital self-care management tools are not currently covered by insurance companies.

Available long-term data is limited, and the impact on glycaemic control remains controversial [73, 77].

### Future directions

Remote monitoring could facilitate the identification of individuals who need more frequent interventions and immediate attention from healthcare professionals using centralised platforms [78–80].

The incorporation of mental health support within telemedicine platforms could also help address the psychosocial and behavioural challenges associated with type 1 diabetes management [77]. Improving access to the required digital infrastructure and reducing inequities would require:

– A multidisciplinary diverse team, that allows engagement with individuals from different ethnic and socioeconomic backgrounds.
– Population-based tools to prioritise care are essential to reduce inequities in diabetes care [81].

In conclusion, telemedicine and remote monitoring are transforming type 1 diabetes management by enabling continuous, patient-centred care that facilitates overcoming geographical and logistical barriers.

### Recommendations

– Telemedicine should complement but not replace face-to-face consultations.
– Adherence to data privacy and protection according to the Federal Act on Data Protection are essential.
– Standardisation of telemedicine protocols and guidelines for managing type 1 diabetes via telemedicine are key to further improving quality of care.
– There is a need for clear reimbursement policies for telemedicine consultations and digital tools and interventions in diabetes care.

## Teaching theory and practice

### Starting CGM and pump therapy

When starting CGM or pump therapy, choosing the appropriate model is critical. For pump therapy covering total daily insulin needs, particularly in insulin-resistant patients, this may necessitate pumps with larger reservoirs. Patient autonomy and device usability must also be taken into account.

To calculate basal rates, the evaluation of CGM curves, basal and total insulin doses from multiple daily injections are useful. A common practice is to reduce the basal dose by about 20% and split it evenly over 24 hours, although no evidence-based protocols currently support this approach. A single basal rate is often sufficient, and for patients with a significant dawn phenomenon, the basal rate can be increased by 20% between 4 am and 7 am. Bolus and correction doses remain the same as with multiple daily injections. The risk of diabetic ketoacidosis needs to be evaluated in order to adjust appropriate training.

AID systems provide better protection against hypoglycaemia. The use of fewer carbohydrates for the prevention and treatment of hypoglycaemia, 4 g and 8 g respectively (in mild hypoglycaemia 3.0–3.9 mmol/l), should be taught [82]. Basal insulin adjustment needs to be tailored to patient preference and medical situation. Depending on the algorithm, glucose target, insulin sensitivity factor or duration, and hourly basal rate can affect both correction boluses and basal modulation. The insulin correction factor can be reinforced (90/total insulin dose vs 100/total insulin dose). A starting carbohydrate/insulin rate of 400/total insulin dose can be used.

Despite all the advantages of Diabetes and Technology, individualised training and close follow-up by a multidisciplinary diabetology team (physician, nurse, dietitian, psychologist) are essential. Living with diabetes is a complex task that requires the acquisition of many skills, appropriate self-care and possibly psychological support. Appropriate diabetes self-management is difficult to acquire and sustain. Therefore, education as well as psychological support should be regularly considered as part of diabetes self-management education and support interventions.

### Diabetes self-management education and support (DSMES) programmes

Diabetes self-care is a time-consuming and complex task and needs to consider everything an individual patient does on a daily basis. It has been estimated to be ~1.5 to ~4 hours per day for adults with uncomplicated type 2 diabetes and up to ~5 hours for children with type 1 diabetes [83]. Diabetes self-management education (DSME) is the active, ongoing process of facilitating the knowledge, skill and ability necessary for diabetes self-care. The complexity of adjusting insulin administration to metabolic needs requires the acquisition of numerous skills and formal training to acquire the ultimate goal of avoiding long-term diabetes-related complications [12].

An expert group of the Canadian Diabetes Association recommended in 2018 to include decision-making among the essential components of diabetes self-management education, stating that diabetes self-management education is "*a*

*process to facilitate individuals in decision-making, resulting in improvements in variables, such as knowledge, attitudes and self-efficacy, as well as improvements in healthy behaviours and clinical outcomes" [84].*

Structured diabetes self-management education and support interventions have demonstrated strong benefits for people with type 1 diabetes that include improvements in (a) general knowledge, (b) competencies in the use of insulin and technologies, (c) quality of life, (d) self-care, (e) emotion regulation and (f) problem solving. The four main diabetes self-management education and support programmes are the Diabetes Teaching and Treatment Programme(DTTP), Functional Insulin Therapy (FIT), Dose Adjustment for Normal Eating (DAFNE) and Diabetes Education Programme for Type 1 Diabetic Patients (PRIMAS). Participation in such diabetes self-management education and support programmes is associated with improved clinical and biological outcomes and decreased morbidity. All these diabetes self-management education and support programmes use a group format and should be accessible to all people with type 1 diabetes, based on a constantly updated curriculum, and be regularly audited.

The curriculum of the validated diabetes self-management education and support programmes is based on constant themes such as insulin, hypoglycaemia, carbohydrate counting, physical exercise and sick day management. Theoretical settings associated with positive clinical outcomes are based on promoting learning through cognitive skills (debates, simulations of specific situations and cases) and an experiential approach to practicing in group-based settings (guided exercises).

After years of debate, the REPOSE study has demonstrated the importance and the distinct role of structured diabetes self-management education and support training in maximising the advantages of technologies in diabetes management [85]. Compared with those treated with multi-daily injections, pump-treated patients experienced similar improvements in diabetes control after the DAFNE programme [85]. In the Insulin Pump Treatment (INPUT) study, participants who had already attended PRIMAS, succeeded in further lowering HbA1c levels, as well as severe hypoglycaemia, by combining pump therapy with 18 sessions of specific training, even though only 2 sessions were specifically dedicated to pump therapy use [86].

Although AID systems have been commercially available since 2019, specific structured diabetes self-management education and support programmes still need to be validated. Moreover, only a minority of the existing programmes have updated their curriculum with topics such as CGM use or pump therapy [82, 83]. This indicates that there is a need for further improvements, and the immediate need to integrate Diabetes and Technology training into diabetes self-management education and support programmes to maintain appropriate self-care in the long run. The use of AID systems implies true changes in diabetes management and also requires accepting to delegate part of diabetes care to the algorithm.

In conclusion, appropriate implementation of diabetes self-management education and support interventions is the cornerstone of use of Diabetes and Technology, and it provides the necessary foundation for implementing and maintaining the necessary strategies and health behaviours that prevent diabetes-related complications.

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| Supplementary Table 1a<br>Continuous Glucose Monitoring systems available in Switzerland | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Firm** | **Ascensia** | **Dexcom** | | **FreeStyle** | | **Medtronic** | | **Medtrum** | **Roche** |
| **CGM systems** | Eversence E3 | Dexcom G6 | Dexcom G7 | FreeStyle Libre 2<br>FreeStyle Libre 2 Plus[a] | FreeStyle Libre 3<br>FreeStyle Libre 3 Plus[b] | Guardian 3<br>Guardian 4[c] | Simplera<br>Simplera Sync™ [d] | TouchCare Nano | Accu-Chek SmartGuide |
| **Age (years)** | ≥ 18 | ≥ 2 | ≥ 2 | FreeStyle 2: ≥ 4<br>FreeStyle 2 Plus: ≥ 2 | FreeStyle 3: ≥ 4<br>FreeStyle 3 Plus: ≥ 2 | > 7 years | ≥ 2 years | > 2 years | ≥ 18 |
| **MARD** | 8,50% | 9,00% | 8,20% | FreeStyle 2 and Plus[a]:<br>9,2%/(9,4% 4-17 yo)<br>8,2%/(8,1% 6-17 yo) [a] | FreeStyle 3 and Plus[b]<br>7,5% (8,6% 6-17 yo)<br>7,5% (8,6% 6-17 yo) [b] | 9,60%<br><br>10,20% [c] | 10,20%<br><br>10,20%[d] | 9,70% | 9.2% |
| **Lifetime sensor (days)** | 180 | 10 | 10 | FreeStyle 2 : 14<br>FreeStyle 2 Plus: 15 | FreeStyle 3 : 14<br>FreeStyle 3 Plus: 15 | 7 | 7 | 14 | 14 |
| **initialization time** | 24h | 2h | 30mn | 1h | 1h | 2h | 2h | 1h | 1h |
| **Number of Calibrations per 24h** | 4 within first 36h<br>2 for first 21 days then 1-2 | No | No | No | No | 2<br>No [c] | No | No | Once every 14 days |
| **Insertion place** | Upper arms (surgical incision)<br>Sensor: 1,8x0,4x0,4 | Upper arms abdomen, buttocks for 2-17 yo | Upper arms abdomen, buttocks for 2-6 yo | Upper arms | Upper arms | Upper arms<br>Abdomen<br>Buttocks for 2-13 and 7-17yo[c] | Upper arms<br>Buttocks for 2-17 yo | Upper arms<br>Abdomen | Upper arms |
| **Receiver** | No | Yes | Yes | Yes | Yes | No | No | No | No |
| **Transmitter Size (cm)** | 3,8x4,8x0,9 | 4,6 x 3 x 1,5 | 2,4 x 2,7 x 0,5 | 3,5 x 3,5 x 0,5 | 1,9 x 1,9 x 0,3 | 3,5x2,8x0,7 | 2,86x2,86x 0,47 | 2,8 x 1,8 x 0,5 | 3,33*x0,59 (diameter*) |
| **Weight (g)** | 11 | 12 | 7,5 | 5 | 1 | 7 | 4,6 | 5 | 5 |
| **Water-resistant** (depth and duration) | 1 m<br>30 min | 2,4 m<br>24h | 2,4 m<br>24h | 1 m<br>30 min | 1 m<br>30 min | 2,4 m<br>24h | 2,4 m<br>24h | 2,5 m<br>1h | 1 m<br>30 min |
| **Readout software** | Eversense DMS | Clarity | Clarity | Libreview | Libreview | Carelink personal<br>Carelink Clinic [c] | Carelink personal<br>Carelink Clinic[d] | Medtum EasyView | Accu-Chek Care |
| **App** | Eversense Mobile | Dexcom G6 | Dexcom G7 | Freestyle 2 | Freestyle 3 | MiniMed Mobile | Simplera MiniMed Mobile[d] | EasySense | Accu-Chek® SmartGuide and Predict app |
| **Follow function** | Eversense NOW | Dexcom Follow | Dexcom Follow | Librelink | Librelink | Carelink connect | Carelink connect | Easy Follow App | None |

| Supplementary Table 1b :<br>Insulin pumps connected with a CGM system | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Firm** | **Insulet** | | **Ypsomed** | **Medtronic** | | | **Tandem** | **Medtrum** |
| **Pump** | Omnipod DASH | Omnipod 5 | YpsoPump | MiniMed™ 640G 670G | MiniMed™ 740 G | MiniMed™ 780 G | t:slim X2 | TouchCare Nano |
| **Tube** | No | No | Yes | Yes | Yes | Yes | Yes | No |
| **Availability** | Yes | Yes | Yes | no longer marketed | Yes | Yes | Yes | Yes |
| **Size (cm)** | Pod: 3,9 x 5,2 x 1,45<br>PDM: 6,3 x 13 x 1 | POD: 3,9 x 5,2 x 1,45<br>PDM: 14,2 x 6,55 x 1,23 | 7.8x4.6x1.6 | 5,3 x 9,6 x 2,44 5,3 x 9,6 x 2,5 | 5,8 x 10,2 x 2.8 cm | 5,36 x 9,68 x 2,49 | 7,95 x 5,08 x 1,52 | PATCH 200U:<br>4,05 x 3,15 x1,15<br>PATCH 300U:<br>5,05 x 31,5 x 11,5<br>PDM: 4,84 x 7,62 x 0,93 |
| **Weight (g)**<br>Battery AA :12 g<br>Battery AAA : 24 g | Pod : 26<br>PDM: 106 | POD: 26<br>CONTROLER: 165 | 83 (with battery AAA + insulin) | 95.7 106<br>+ battery AA | 117<br>+ battery AA | 117<br>+ battery AA | 112 | Patch : 14 |
| **Water resistant** | 7.6m / 1h | 7.6m / 1h | | 3.6m / 24h | 3.6 m / 24 h | 3.6 m / 24 h | 0.91m / 30 mn | 2.5 m /1h |
| **No. of units of insulin per reservoir or pre-filled cartridge** | Fill between 80 and 200 units each Pod | Fill between 80 and 200 units each Pod | Prefilled cartridges and reservoir of 160 units | 2 reservoir sizes : 180 or 300 units | 2 reservoir sizes : 180 or 300 units | 2 reservoir sizes : 180 or 300 units | Fill between 50 and 300 units | 2 reservoir sizes:<br>200 or 300 units |
| **Age** | 2 yo | 2 yo | no age limit | 640G : no age limit<br>670G : ≥ 2 yo | no age limit | ≥ 7 yo | ≥ 6 yo | ≥ 18 yo |
| **SAP** | | | | Yes | Yes | Yes | | |
| **AID** | Open AID | Yes | Yes | No | No | Yes | Yes | Yes |
| **Name of AID** | | Omnipod5 | CamAPS FX | | | SmartGuard | Control IQ | TouchCare Nano |
| **Type of AID** | APS and Loop | MPC | MPC | | | PID-IFB | MPC | MPC |
| **Sensor / AID** | | Dexcom G6 or G7<br>Freestyle 2 Plus | Dexcom G6<br>Freestyle 3 and Plus | Guardian 3 | Guardian 3 | Simplera Sync<br>Guardian 4 | Dexcom G6 or G7 | Touchcare Nano CGM |
| **AID requirements** | | | | | | 8-250 units/day | 10-100 units/day<br>Weight >25 kg | |
| **Age for AID (years)** | | ≥ 2 yo | 1 yo | | | ≥ 7 yo | ≥ 6 yo | > 2 yo |
| **Readout software** | Glooko | Glooko | Glooko | Carelink personal<br>Carelink Clinic | Carelink personal<br>Carelink Clinic | Carelink personal<br>Carelink Clinic | Glooko | Medtrum EasyView |
| **App** | No | No in EU | CamAPS FX | | | Minimed Mobile | | |
| **Follow function** | | Dexcom Follow | Companion app | | | Carelink connect | Dexcom Follow | Easy Follow App |

AID : Automated Insulin Delivery
MARD : Mean Absolute Relative Difference
No. : Number
PDM : Personal Diabetes Manager
Pod: tubeless insulin patch pump
SAP :  Sensor Augmented Pumps
MPC : Model Predictive Control
PID-IFB : Proportional Integral Derivative Insulin Feedback
yo : years old