



The 2026 Update of the IDF-DAR Risk Calculator for Fasting in People with Diabetes

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Abstract

Background Risk stratification is essential for guiding individuals with diabetes during Ramadan. While the 2021 International Diabetes Federation–Diabetes and Ramadan (IDF-DAR) Risk Calculator provided a structured, evidence-based approach, recent multinational surveys and real-world studies have generated new insights into patient characteristics, therapy patterns, and complications associated with fasting. These findings highlighted the need to refine risk assessment to reflect real-world practice and individual vulnerability.

Materials and Methods The 2026 IDF-DAR Risk Calculator was developed through a multistage, consensus-driven process involving endocrinologists and diabetes specialists. The steering committee reviewed the latest literature, analyzed case scenarios, and incorporated data from the DAR Global Surveys and other regional validation studies. Risk factors—including frailty, pregnancy, multiple microvascular complications, and therapy-related elements—were systematically re-evaluated to enhance predictive accuracy and clinical relevance.

Results The updated calculator stratifies patients into three categories: low (score 0–3), moderate (score 3.25–6), and high (score > 6). Key modifications include refined hypoglycemia thresholds, the incorporation of advanced diabetes technologies, and the reweighting of patient vulnerability factors. Validation studies across diverse populations confirmed the tool's predictive accuracy while maintaining a cautious approach to ensure safety. The 2026 update aligns medical guidance with religious considerations, supporting individualized, practical, and safe fasting recommendations.

Conclusion The 2026 IDF-DAR Risk Calculator update offers a refined, evidence-based framework for evaluating fasting risk in individuals with diabetes. By integrating emerging real-world data, updated therapy considerations, and individual vulnerability

Keywords

- diabetes
- Ramadan fasting
- risk stratification
- IDF-DAR
- hypoglycemia
- frailty

factors, it strengthens shared decision-making between patients, clinicians, and religious authorities. Future prospective validation and digital integration will further optimize its global applicability.

Introduction

Risk stratification is a cornerstone in guiding individuals with diabetes who wish to fast during Ramadan. It forms the basis for clinical decision-making, individualized recommendations, and patient education tailored to the specific needs of each individual during the fasting period. The approach to risk assessment has evolved from the four-tier system recommended by the American Diabetes Association in 2005 and 2010^{1,2} to the three-tier traffic light system introduced in the International Diabetes Federation–Diabetes and Ramadan (IDF-DAR) guidelines.³ This change reflected a growing understanding of the variability in fasting safety across different patient populations.^{4–6} The history and evolution of the risk concept, as well as the development of its assessment tools, have been thoroughly reviewed over the past half-century.⁷

Despite these structured frameworks, emerging evidence indicated that some individuals previously classified as “high-risk” were able to fast safely, often due to improved self-monitoring, adherence to therapy, and individualized management.^{8–10} More recently, large-scale real-world studies have provided further insights into specific patient populations, including individuals with type 1 diabetes (T1D) and chronic kidney disease,¹¹ those using different insulin regimens during Ramadan,¹² and patients with diabetic retinopathy.¹³ These studies underscore the importance of incorporating individualized clinical factors, therapeutic adjustments, and real-world fasting behaviors into risk assessment, thereby paving the way for a more flexible and evidence-based approach.

The 2021 IDF-DAR Risk Calculator

The 2021 IDF-DAR Risk Calculator was developed to provide clinicians with a practical and flexible tool for standardized, patient-specific risk stratification.¹⁴ While often implemented electronically, the calculator can be printed, incorporated into medical records, or hosted on a Web site, allowing broad accessibility across diverse clinical settings. Each patient’s risk factors—ranging from diabetes type and duration, glycemic control, treatment regimen, to comorbidities—are scored, with the cumulative score determining the overall risk category: low, moderate, or high. This system allows health care providers to offer personalized guidance, even to patients who choose to fast despite an elevated risk. The scoring system was translated into practical recommendations on fasting, which doctors and religious scholars can deliver in harmony.¹⁴ Importantly, the 2021 tool established the foundation for subsequent studies assessing its reliability, usability, and predictive validity across multiple patient populations.

Validation and Utility of the 2021 Risk Calculator

Multiple studies have evaluated the validity, reliability, and clinical utility of the IDF-DAR tool in various settings (► **Table 1**). Afandi et al¹⁵ explored clinician consistency using 26 scenarios scored by 312 specialists, demonstrating moderate overall agreement, with significant discrepancies in moderate-risk cases, suggesting the need for training and calibration in tool application. Mohammed et al¹⁶ evaluated 659 patients and found strong correlations between higher risk scores and adverse outcomes, including hypoglycemia and hyperglycemia, affirming the tool’s predictive validity.

Noor et al¹⁷ from Sudan and Kamrul-Hasan et al¹⁸ from Bangladesh found that while the tool correctly identified high-risk individuals, it may be conservative in classifying T2D patients, potentially leading to overly cautious recommendations. Shamsi et al¹⁹ from Bahrain and Malik et al²⁰ from Pakistan confirmed that hypoglycemia was the primary cause of fasting interruption and that high-risk classification aligned with complication rates.

Alfadhli et al²¹ from Saudi Arabia observed that more than half of high-risk patients fasted despite the risk, highlighting the importance of individualized discussions beyond tool-based categorization. Baynouna Alketbi et al²² (United Arab Emirates) and Almalki et al²³ (Saudi Arabia) demonstrated clear correlations between higher risk scores and complication rates, while also emphasizing that older age and frailty independently contribute to fasting difficulty. Reesi et al²⁴ studied 326 patients in a multicenter observational study in Oman, showing that patients with T1D experienced more complications and episodes of diabetic ketoacidosis, reinforcing the validity of the tool, particularly in high-risk groups. Jamaluddin et al (2025)²⁵ reported on a nationwide multicenter primary-care study in Malaysia, confirming the utility of the IDF-DAR tool while noting the need for refinement to improve predictive accuracy in diverse primary-care settings.

Additionally, Khorasani et al²⁶ found that the majority of patients fell into low- and moderate-risk categories, suggesting that not all patients should be entirely exempt from fasting during Ramadan. Oueslati et al²⁷ utilized the tool to assess the knowledge and practices of individuals with diabetes, as well as the prevalence of complications during fasting, both before and after an education program. Emerging evidence also supports the practical application of the tool in modern clinical practice, including studies on insulin regimen adjustments,¹³ continuous glucose monitoring (CGM),¹² and the role of microvascular complications.¹⁴ A recent study from the Global 2020–2022 DAR Survey further demonstrated that higher pre-Ramadan HbA1c is strongly associated with unfavorable fasting outcomes.²⁸ It importantly supports the 7.5% and 9.0% cutoffs originally adopted in the 2021 calculator.

Table 1 Summary of key outcomes and conclusions of the validation and utilization studies of the IDF-DAR risk assessment tool 2021

Authors (ref) (year)	Site	Key outcomes	Conclusions
Afandi et al ¹⁵ (2023)	International	Wide variation in moderate-risk classification; accuracy 33–85%	Need for standardized training in tool application
Mohammed et al ¹⁶ (2023)	Multisite	Higher risk scores were correlated with fasting nonadherence and an increased number of episodes of hypoglycemia/hyperglycemia	The tool reliably predicts fasting capability and risk level
Noor et al ¹⁷ (2023)	Sudan	Most are classified as high-risk; age is a significant predictor	The tool is effective, but demographic context matters
Kamrul-Hasan et al ¹⁸ (2023)	Bangladesh	Low complication rates; 71% fasted despite high-risk classification	The tool may overestimate risk in some T2D populations
Shamsi et al ¹⁹ (2024)	Bahrain	Hypoglycemia was the leading reason for breaking the fast	Supports the tool's predictive validity
Malik et al ²⁰ (2024)	Pakistan	57.9% experienced hypoglycemia despite counseling	The tool correctly flags individuals who need enhanced monitoring
Alfadhli et al ²¹ (2024)	Saudi Arabia	56.9% were high-risk; > 50% fasted anyway	The tool helps guide decision-making, but it must be balanced with patient autonomy
Baynouna Alketbi et al ²² (2025)	United Arab Emirates	High-risk linked to age, frailty, and adverse events	The tool is effective across primary-care settings
Almalki et al ²³ (2025)	Saudi Arabia	Hyperglycemia is more frequent in the high-risk group; best adherence in the moderate-risk group	The tool may be conservative in some subgroups
Reesi et al ²⁴ (2025)	Oman	T1D patients had more complications and DKA episodes	Reinforces the tool's validity and risk-based decision-making, especially in high-risk groups
Jamaluddin et al ²⁵ (2025)	Malaysia	The tool identifies high-risk patients during RF in primary care. It has poor calibration and specificity	Enhancing the tool's calibration could allow for better individual risk estimation and more precise clinical decision-making
Khorasani et al ²⁶ (2024)	Iran	Patients were stratified according to the three IDF-DAR risk groups. The majority of patients fell into the low- and moderate-risk categories	The majority should not be entirely exempted from RF. However, the validity was evaluated through prospective longitudinal studies
Oueslati et al ²⁷ (2024)	Tunisia	PRE-improved lifestyle monitoring; metabolic event reduction not significant	The tool adds value as preventive guidance rather than a corrective measure

Abbreviations: IDF-DAR, International Diabetes Federation–Diabetes and Ramadan; DKA, diabetic ketoacidosis; PRE, pre-Ramadan Evaluation; RF, Ramadan fasting; T1D, type 1 diabetes; T2D, type 2 diabetes.

Collectively, these studies reinforce the IDF-DAR Risk Calculator as a crucial/valuable adjunct in Ramadan planning for people with diabetes, while emphasizing the continued need for clinical judgment, individualized adaptation, and ongoing education to ensure safe and practical fasting recommendations.

Rationale for the 2026 Update of the IDF-DAR Risk Calculator

The 2026 update of the IDF-DAR Risk Calculator was driven by emerging clinical evidence and real-world observations that broadened the understanding of the risk of fasting in people with diabetes (► **Tables 1 and 2**). Large multinational

studies, registry analyses, and surveys provided important insights into specific populations, including individuals with T1D and chronic kidney disease,¹² those on different insulin regimens during Ramadan,¹³ and patients with microvascular complications such as diabetic retinopathy.¹⁴

These studies highlighted the need to upgrade the 2021 tool and underscored the importance of integrating individualized clinical factors, therapy adjustments, and real-world fasting behaviors into risk assessment. The update, therefore, aimed to incorporate new evidence to make the risk stratification more individualized, evidence-informed, and applicable to daily practice, while maintaining a safety-first approach.

Table 2 The key changes in the 2026 updated DAR risk stratification tool, along with the rationale for each change

Change/new element	Rationale	Supporting evidence
Diabetes classification (T1D + LADA grouped; T2D + others grouped)	Simplifies classification and maintains consistency with 2021	Expert consensus
Duration of diabetes (> 20 y threshold)	Longer disease duration linked to complications and glycemic instability	Registry data; expert consensus
Hypoglycemia scoring (severity, frequency, awareness)	Hypoglycemia is the main cause of fasting interruption; refined scoring improves predictive accuracy	³⁰ ; DAR survey data
Continuous glucose monitoring	Provides real-time glucose data; reduces risk by supporting timely interventions	¹²
Treatment categories (AID systems, ultra-long-acting basal insulins, modern SUs, SGLT2i, GLP-1 RA)	Reflects new therapies with different risk profiles; aligns with contemporary practice	^{13,29,40}
HbA1c cutoffs ($\geq 7.5\%$, $\geq 9\%$)	Validates thresholds for fasting risk prediction	²⁸
Microvascular complications (retinopathy, neuropathy, diabetic foot)	Independently increase fasting risk and glycemic instability	^{14,58}
Macrovascular complications	Strong predictor of adverse outcomes during fasting	³²
Frailty and cognitive impairment	Independent predictors of fasting safety beyond age	Geriatric risk models; expert consensus ^{22,50}
Pregnancy (all diabetes types, GDM)	High maternal and fetal risk during fasting	Guideline consensus; limited direct evidence ³⁶
Albuminuria/impaired renal function	Predicts instability and worsens outcomes	³¹
Fasting-focused education	Improves self-management and reduces complications	^{27,53–57}
Fasting duration and labor intensity	Longer fasting hours and heavy labor increase the risk	Epidemiological studies; expert consensus
Artificial intelligence and digital health tools	Emerging role in personalizing Ramadan care	⁵⁹

Abbreviations: AID, automated insulin delivery; DAR, Diabetes and Ramadan; GDM, gestational diabetes mellitus; GLP-1 RA, glucagon-like peptide-1 receptor agonist; LADA, Latent Autoimmune Diabetes in Adults; SGLT2i, sodium–glucose cotransporter 2 inhibitor; SUs, sulfonylureas; T1D, type 1 diabetes; T2D, type 2 diabetes.

Methodology of the IDF-DAR Risk Calculator 2026 Update

The 2026 update of the IDF-DAR Risk Calculator is shown in ► **Fig. 1** and its translation of score points to risk levels is shown in ► **Fig. 2**. The update followed a structured, multi-stage process to ensure both scientific rigor and clinical relevance. A steering committee of endocrinologists systematically reviewed the 2021 tool, identified gaps, and analyzed multinational survey data and observational studies.

Risk factors were re-evaluated and reweighted to improve discrimination across low-, moderate-, and high-risk categories. Particular attention was given to frailty, cognitive impairment, pregnancy, multiple microvascular complications, fasting duration, and labor intensity. Modern diabetes management tools—including CGM, automated insulin delivery systems, and advanced insulin formulations—were incorporated to reflect their valuable role in fasting blood glucose management.^{29–36}

Case scenarios representing diverse patient profiles were developed to test and refine the scoring system. These were independently reviewed by committee members, with dis-

crepancies resolved through an iterative consensus process. This process ensured that the calculator combined evidence-based precision with real-world applicability, allowing use across outpatient clinics, hospital records, electronic health systems, or paper-based references.

Finally, the methodology emphasized not only predictive accuracy but also applicability in daily practice, aligning medical guidance with religious considerations and supporting shared decision-making between patients, health care providers, and religious scholars.^{11,37}

Key Modifications in the 2026 Update

The 2026 IDF-DAR Risk Calculator incorporates several major updates, all based on emerging evidence over the last 5 years (► **Table 2**). These modifications make risk assessment more individualized, evidence-informed, and aligned with real-world clinical practice, while maintaining a conservative, safety-focused approach.^{38–42}

The changes in the 2026 update, along with their rationale, are highlighted in ► **Table 2**. These are briefly discussed below. T1D and Latent Autoimmune Diabetes in Adults are grouped, while T2D and other types of diabetes remain

DAR Risk Assessment Tool (2026)	
Fasting Risk Element	Risk Score
1. Pregnancy with any type of diabetes	
• Yes	6.5
2. Diabetes type	
• Type 1 diabetes or LADA	1
• Type 2 diabetes or any other type of diabetes	0
3. Duration of diabetes (years)	
• > 20 years	1
• 10-20 years	0.5
• < 10 years	0
4. Type of diabetes treatment (select all that are relevant)	
• Multiple daily premixed insulin injections	2
• Once daily premixed insulin	1.5
• Open loop insulin pump	1.5
• Automated insulin delivery system	1
• Standard basal insulin (NPH, Detemir or Glargine 100)	1
• Ultra long-acting basal insulin (Glargine 300 or Degludec)	0.75
• Short acting insulin	0.75
• Glibenclamide or Glipizide	0.75
• Modern sulfonylurea (Gliclazide, Gliclazide MR, Glimepiride) or Repaglinide	0.5
• ≥2 glucose-lowering medications excluding insulin or sulfonylurea	0.25
• Nutrition modification only or monotherapy (excluding insulin or sulfonylurea)	0
5. Presence of hypoglycemia	
• Impaired hypoglycemia awareness	6.5
• Severe hypoglycemia during last 4 weeks	5
• Hypoglycemia more than once daily	4
• 6-7 episodes of hypoglycemia/week	3
• 3-5 episodes of hypoglycemia/week	2
• 1-2 episodes of hypoglycemia/week	1
• Hypoglycemia <1 time per week	0.5
• No hypoglycemia in last 4 weeks	0
6. Level of A1c	
• > 9% (>75 mmol/mol)	1
• 7.5-9% (58-75 mmol/mol)	0.5
• < 7.5% (<58 mmol/mol)	0
7. Glucose monitoring	
• Not done	2
• Suboptimally done	1
• Done as indicated	0
• Any type of CGM	-0.5
8. Hyperglycemic emergencies	
• DKA or HHS in the last month	3.5
• DKA or HHS in last 2-3 months	2
• DKA or HHS in last 4-6 months	1
• No DKA or HHS in the last 6 months	0
9. Macrovascular complications	
• Unstable macrovascular disease	6.5
• Stable macrovascular disease	2
• No macrovascular disease	0
10. Microvascular complications	
a. nephropathy	
• eGFR < 30 mL/min	6.5
• eGFR 30–45 mL/min	4
• eGFR 45–60 mL/min	2
• eGFR >60 mL/min	0
b. neuropathy, foot complications, or diabetic retinopathy	
• 3 microvascular complications	3
• 2 microvascular complications	2
• 1 microvascular complication	1
• 0 microvascular complications	0
11. Cognitive function, frailty, and age	
• Impaired cognitive function	6.5
• Advanced frailty	6.5
• Mild to moderate frailty	4
• Age > 70 years with no home support	1
• Normal cognitive function and no frailty	0
12. Physical labor	
• High intensity	4
• Moderate intensity	2
• Low intensity	0
13. Fasting focused education	
• Yes	0
• No	1
14. Fasting hours	
• ≥ 16 hours	1
• < 16 hours	0

Fig. 1 The 2026 DAR Risk Calculator: The narrative fasting risk elements are translated into numerical risk scores. The total risk score for a given patient is the sum of the individual risk points.

SCORE	RISK LEVEL
Score 0 -3 points	LOW RISK
Score 3.25 - 6 points	MODERATE RISK
Score >6 points	HIGH RISK

Fig. 2 The Three-Tier Risk Scoring System and its associated risk categories.

grouped, both with similar scoring as in the 2021 version. A duration of more than 20 years is now recognized as a stronger risk factor, with adjusted scoring to reflect disease progression over time. Regarding hypoglycemia scoring, the system was expanded to account for recognition, severity, and frequency of hypoglycemia, enabling clearer differentiation of risk.

CGM has been introduced with an advantageous score of -0.5 for patients using CGM, reflecting its ability to reduce the risk of fasting by providing real-time glucose data and enabling timely interventions.^{43–48} The treatment types and medications included newer therapies such as closed-loop insulin pumps, ultra-long-acting basal insulins, modern sulfonylureas, sodium–glucose cotransporter 2 inhibitors, and glucagon-like peptide-1 receptor agonists, which are now considered, with specific risk points assigned to different combinations of insulin and oral agents.^{13,29,49} The 2026 scoring has been modified based on current evidence, with HbA1c cutoffs better aligned with fasting risk in various degrees of glycemic control.²⁸

For the first time, microvascular complications—including diabetic retinopathy, neuropathy, and diabetic foot—are incorporated into scoring, ranging from 0 to 3 points depending on the number of complications.^{12,14,31,33} Also, a more practical scoring system was introduced, distinguishing advanced frailty (6.5 points), moderate frailty (4 points), and mild frailty (2.5 points). Dementia and significant cognitive impairment carry 6.5 points.^{22,50}

Pregnant women with gestational diabetes or any diabetes are now classified as high risk (6.5 points), reflecting limited but compelling evidence of increased complications during fasting.^{36,51}

A new element has been introduced to reflect the impact of and access to fasting-focused education.^{52–57} A score of 1 is assigned to patients who did not receive structured fasting education and 0 to those who did, highlighting the protective role of education in safe fasting practices.

Collectively, these updates expand the recognition of patient vulnerability while also acknowledging the protective role of modern technologies and education. They enhance the precision and applicability of the calculator, allowing clinicians to tailor guidance to each patient's clinical profile, comorbidities, treatment regimen, and lifestyle—thereby promoting safer and more informed fasting decisions in alignment with contemporary evidence and the realities of Ramadan care.

Integrated Religious and Practical Considerations

The updated 2026 risk calculator maintains consistency with recognized Islamic guidance, ensuring that medical recommendations align with religious rulings on fasting. While the scoring system has been modified based on emerging clinical evidence, the principles of safety and minimizing the burden of illness remain central.

► **Fig. 3** translates the practical considerations that reflect the integration of medical opinion and religious guidance. First, patients with low scores (between 0 and 3 points) are deemed to have a minimal risk (0–3 points). For this group, the medical opinion is that fasting is generally safe with medical evaluation, possible medication adjustment, and close monitoring. This aligns with the religious guidance that fasting is obligatory, stipulating that exemptions are not advised unless fasting itself imposes a physical burden or requires breaking fast with food, drink, or medication. Second, moderate risk is indicated by scores between 3.25 and 6 points. The clinical opinion is that the safety of fasting is uncertain, suggesting that strict monitoring and careful medication adjustment are required. Consequently, the religious guidance stipulates that fasting is preferred; however, patients may be excused if health concerns arise after consultation with their doctor. If fasting is undertaken, adherence to medical advice, including regular glucose monitoring, is essential. Finally, patients with scores greater than 6 points are considered to be at high risk. For the health care professions, fasting is unsafe, and patients are strongly advised against fasting due to the risk of serious complications. Hence, Islamic rulings support the exemption of these high-risk individuals from fasting to preserve their health and prevent harm (► **Fig. 3**).

This integration enables patients, health care providers, and religious scholars to make informed, shared decisions about fasting. By linking medical scoring with religious rulings, the 2026 update provides a unified framework that supports both evidence-based clinical guidance and spiritual obligations. This approach ensures that patients receive recommendations that are not only safe and practical but also culturally and religiously appropriate.

Conclusion

The 2026 IDF-DAR Risk Calculator update offers a refined, evidence-based framework for evaluating fasting risk in

RISK LEVEL [SCORE]	Medical Recommendations	Religious Guidance
LOW RISK [Score 0 - 3 points]	Fasting is probably safe: 1. Medical evaluation 2. Medication adjustment 3. Strict monitoring	1. Fasting is obligatory 2. Advice not to fast is not permitted, unless the patient is unable to fast due to the physical burden of fasting or needing to take medications, food, or drink during the fasting hours.
MODERATE RISK [Score 3.25 - 6 points]	Fasting safety is uncertain: 1. Medical evaluation 2. Medication adjustment 3. Strict monitoring	1. Fasting is preferred, but patients choose not to fast if they are concerned about their health after consulting the doctor and taking into account the full medical circumstances and the patients' own previous experience. 2. If the patient does fast, he/she must follow medical recommendations, including regular blood glucose monitoring.
HIGH RISK [Score >6 points]	Fasting is probably unsafe	Advise against fasting.

Fig. 3 The integrated medical and religious interpretations and recommendations of the calculated risk score.

individuals with diabetes. By integrating recent clinical data and aligning with religious guidance, it strengthens shared decision-making between patients, health care providers, and scholars, while prioritizing safety and minimizing the burden of illness. Future validation, digital integration, and continuous refinement will be essential to optimize its global applicability and support safer fasting practices worldwide.

Authors' Contribution

All authors contributed to the conception, data collection, writing, and final approval of the manuscript.

Statement of Ethics

Ethical approval is not required.

Data Availability Statement

Not applicable.

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Conflict of Interest

None declared.

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