



Ramadan card with lantern and dates (photo: iStock by Getty Images).

Monday May 6 marks the start of Ramadan, a holy month of fasting, introspection and prayer observed by most of the world's 1.6 billion Muslims. Ramadan will end on Tuesday, 4th June 2019. A common greeting is "Ramadan Mubarak", which means "Happy Ramadan". Eid al Fitr, which is a celebration to end the Ramadan fast, will be on Wednesday, 5th June 2019. A common greeting is "Eid Mubarak" which means happy Eid.

Fasting during the holy month is one of the five pillars of Islam. The pillars also include professing one's faith, praying five times a day, donating money to charity and making the hajj pilgrimage to Mecca. To fast, Muslims abstain from eating, drinking, smoking and engaging in sexual activity from dawn (suhoor) to sunset (iftar). Ramadan is celebrated as the month during which Prophet Muhammad (pbuh) received the initial revelations of what became the Quran. Ramadan is a month of the Islamic lunar calendar and, therefore, its duration varies in different seasons year to year and moves back 10 days each year.

The main purpose of fasting is to attain righteousness, inwardly and outwardly, by abstaining from sinful deeds and training their selves to control their thoughts and desires. Other benefits include attaining nearness and closeness to God (Allah) so that He becomes a reality in their lives. Having self-reflection and appreciation of Allah's blessings, to develop and strengthen their powers of self-control, remembering and helping the people in need. Fasting is a deeply spiritual practice that is meant to benefit them in body, mind, and heart.

Exemptions from fasting Ramadan

there are clear exceptions from fasting to the requirements noted in the Quran and in the hadiths, recorded descriptions of the words and actions of the Prophet Muhammad (pbuh). Scholars of Islamic law, have parsed through the nuances of these exceptions for centuries and make recommendations to observant Muslims on how best to observe the faith. There are several groups of people who scholars agree are not required to fast during Ramadan. These include the elderly, people who are pregnant, nursing or menstruating, people who are ill and travelers. There's a variation of opinion among scholars of Islamic law regarding what constitutes exemption within those groups. For instance, What it means to travel and how far differs among scholars.

Treatments and procedures that invalidate or do not invalidate fasting

Many exempt Muslim patients with chronic medical conditions (e.g., diabetes) may still choose to fast. They may discontinue their medications or alter treatment regimens to fast with/out consulting their primary care physicians (PCPs). As a result, serious complications may develop, such as dehydration, hypoglycemia, hyperglycemia, diabetic ketoacidosis, and others.[9] However, safe fasting and sound health can be achieved with professional advice and treatment plans.

Table 1 summarizes the type of medications and medical procedures and conditions that invalidate or do not invalidate fasting according to the Islamic Fiqh Council and the Standing Committee for Academic Research and Issuing Fatwas (Fataawa al-Lajnah ad-Daa'imah), an Islamic organization that issues rulings in Islamic jurisprudence.

Table 1

Treatments and procedures that invalidate or do not invalidate fasting according to the Islamic Fiqh Council and the Standing Committee for Academic Research and Issuing Fatwas[1,2,3,4,5,6,7,].

Treatments and procedures that do not invalidate fasting ^a	Notes
Islamic Fiqh Council <ul style="list-style-type: none"> • Eye drops • Ear drops • Ear syringing • Nasal sprays • Nasal drops • Sublingual tablets or lozenges (for angina pectoris) • Drilling of teeth (prior to filling) • Extraction or polishing of teeth • Using a toothbrush or miswak • Rinsing, gargling or applying topical treatment in the mouth 	As long as the fasting patient does not feel the taste in the throat or swallow any residue
<ul style="list-style-type: none"> • Injections (subcutaneous, intramuscular and intravenous) • Vaginal pessaries • Douching • Use of speculum • Pelvic exam • Placing Intra Uterine Devices (IUDs) • Urine catheters • Dye injection for diagnostic imaging • Oxygen • Creams, lotions and patches • Nicotine patches that are used for quitting smoking • Endoscopy without an administration of solutions or other substances The Standing Committee for Academic Research and Issuing Fatwas <ul style="list-style-type: none"> • Involuntary vomiting including morning sickness due to pregnancy • Involuntary nose bleeding • Insulin injections^{b,c,d} • Puffers and oxygen used for asthma treatment^{e,f,g,h} • Vaccinations (intramuscular route) 	If the treatment or procedure is not urgently needed, it would be recommended to take/schedule it before or after fasting hours
Treatments and procedures that invalidate fasting ^{a,b}	
Islamic Fiqh Council <ul style="list-style-type: none"> • Oral medication during fasting hours • Parenteral nutrition The Standing Committee for Academic Research and Issuing Fatwas <ul style="list-style-type: none"> • Deliberate vomiting • Kidney dialysis 	
<small>^aThe following things do not invalidate fasting according to some Muslim scholars, not committees: blood tests, rectal suppositories, enema, and bleeding from hemorrhoids.^{[1],[2],[3],[7]}</small>	
<small>^{b,c}The following things invalidate fasting according to some Muslim scholars, not committees: donating blood, blood transfusion, and cupping.^[4] ^{d,e,f,g,h}There is a common misconception among both Muslim patients and PCPs that insulin injections and monitoring blood glucose would invalidate fasting.^{[1],[2],[3],[6]} ^{i,j,k,l}Vaporizers and capsules that are used for asthma</small>	

Ramadan fast and diabetes

There are about 90 million Muslims who have diabetes worldwide. Although most Muslim scholars and physicians recommend against fasting for patients with uncontrolled diabetes, a large population-based study that included participants from 13 countries estimated that about 79% of Muslims with Type 2 diabetes would fast during Ramadan.[8]

The International Diabetes Federation (IDF) and Diabetes and Ramadan (DAR) International Alliance created comprehensive guidelines on approaching fasting patients with both Type 1 and Type 2 diabetes.[9] They also combined religious and medical knowledge to recommend when a diabetic patient can or cannot fast. The IDF-DAR guidelines classified diabetic patients into three different categories: first, very high-risk patients who must not fast at all; second, high-risk patients who should not fast; and third, moderate or low-risk patients whose diabetes is well controlled. Table 2 describes in details the three IDF-DAR risk categories and the recommendations for patients with diabetes who fast during Ramadan.[9] When patients from the first two categories insist on fasting, they should carefully follow the medical advice. Importantly, patients should check their blood glucose (BG) levels multiple times during the day and break their fasting immediately if their BG <70 mg/dL (3.9 mmol/L) or BG >300 mg/dL (16.7 mmol/L) or if they become symptomatic of hypoglycemia or hyperglycemia.[9] In addition, diabetic patients should be counseled on the warning signs of hypoglycemia and what should be done if any of them occurs.[9] Furthermore, patients should be advised to eat healthy balanced diet in small two or three meals, between iftar and suhoor, rather than one large meal to avoid postmeal hyperglycemia.

Table 2

International Diabetes Federation-diabetes and Ramadan risk categories and recommendations for patients with diabetes who fast during Ramadan (Adopted from Hassanein *et al.*[9])

Risk category and religious opinion on fasting ^a	Patient characteristics	Comments
<p>Category 1: very high risk</p> <p>Listen to medical advice MUST NOT fast</p>	<p>One or more of the following:</p> <ul style="list-style-type: none"> • Severe hypoglycemia within the 3 months prior to Ramadan^b • Unexplained DKA within the 3 months prior to Ramadan • Hyperosmolar hyperglycemic coma within the 3 months prior to Ramadan • History of recurrent hypoglycemia • History of hypoglycemia unawareness • Poorly controlled T1DM • Acute illness • Pregnancy in pre-existing diabetes, or GDM treated with insulin or SUs • Chronic dialysis or CKD stage 4 & 5 • Advanced macrovascular complications • Old age with ill health 	<p>If patients insist on fasting, then they should:</p> <ul style="list-style-type: none"> • Receive structured education • Be followed by a qualified diabetes team • Check their blood glucose regularly (SMBG) • Adjust medication dose as per recommendations • Be prepared to break the fast in case of hypo- or hyperglycemia • Be prepared to stop the fast in case of frequent hypo- or hyperglycemia or worsening of other related medical conditions
<p>Category 2: high risk</p> <p>Listen to medical advice</p> <p>Should NOT fast</p>	<p>One or more of the following:</p> <ul style="list-style-type: none"> • T2DM with sustained poor glycemic control^c • Well-controlled T1DM • Well-controlled T2DM on MDI or mixed insulin • Pregnant T2DM or GDM controlled by diet only or metformin • CKD stage 3 • Stable macrovascular complications • Patients with comorbid conditions that present additional risk factors • People with diabetes performing intense physical labor • Treatment with drugs that may affect cognitive function 	
<p>Category 3: moderate/low risk</p> <p>Listen to medical advice</p> <p>Decision to use licence not to fast based on discretion of medical opinion and ability of the individual to tolerate fast</p>	<p>• Well-controlled T2DM treated with one or more of the following:</p> <ul style="list-style-type: none"> ○ Lifestyle therapy ○ Metformin ○ Acarbose ○ Thiazolidinediones ○ Second-generation SUs ○ Incretin-based therapy (DPP-4 inhibitors or GLP-1 RAs) ○ SGLT2 inhibitors ○ Basal insulin 	<p>Patients who fast should:</p> <ul style="list-style-type: none"> • Receive structured education • Check their blood glucose regularly (SMBG) • Adjust medication dose as per recommendations
<p>CKD: Chronic kidney disease, DAR: Diabetes and Ramadan International Alliance, DKA: Diabetic ketoacidosis, DPP-4: Dipeptidyl peptidase-4, GDM: Gestational diabetes mellitus, GLP-1 RA: Glucagon-like peptide-1 receptor agonist, IDF: International Diabetes Federation, MDI: Multiple dose insulin, SGLT2: Sodium-glucose co-transporter-2, SMBG: Self-monitoring of blood glucose, SU: Sulphonylurea, T1DM: Type 1 diabetes mellitus, T2DM: Type 2 diabetes mellitus. ^aIn all categories: people with diabetes should follow medical opinion if the advice is not to fast due to high probability of harm. ^bHypoglycemia that is not due to accidental error in insulin dose. ^cThe level of glycemic control is to be agreed upon between doctor and patient according to a multitude of factors</p>		

Modifying the dose of antihyperglycemic medications is an essential component of managing patients with diabetes in Ramadan. Figure 1 describes the dose modification of noninsulin hypoglycemic agents for patients with Type 2 diabetes mellitus, while Figure 2 describes the dose modification of insulin for Type 1 diabetic patients.[2]

<p>Metformin Daily dose remains unchanged Immediate release: OD – Take at iftar; BID – Take at iftar and suhoor; TID – Morning dose at suhoor, combine afternoon and evening dose at iftar Prolonged release: Take at iftar</p>				
<p>Acarbose No dose modifications</p>	<p>TZDs No dose modifications Dose can be taken with iftar or suhoor</p>	<p>Short-acting insulin secretagogues TID dosing may be reduced/redistributed to two doses taken with iftar and suhoor</p>	<p>GLP-1 RAs Once appropriate dose titration has been achieved no further dose modifications are needed</p>	<p>DPP-4 inhibitors No dose modifications</p>
<p>SU Switch to newer SU (gliclazide, glimepiride) where possible, glibenclamide should be avoided OD – Take at iftar.* Dose may be reduced in patients with good glycaemic control BID – Iftar dose remains unchanged.** Suhoor dose may be reduced in patients with good glycaemic control</p>				
<p>SGLT2 inhibitors No dose modifications Dose should be taken with iftar Extra clear fluids should be ingested during non-fasting periods Should not be used in the elderly, patients with renal impairment, hypotensive individuals or those taking diuretics</p>				

Figure 1

Noninsulin dose modifications for patients with Type 2 diabetes mellitus. *Sulphonylurea combination therapy OD – take at iftar and consider reducing the dose by 50%; **Sulphonylurea combination therapy BID – omit morning dose and take normal dose at iftar. BID: Twice daily; DPP.4: Dipeptidyl peptidase-4; GLP-1 RAs: Glucagon-like protein-1 receptor agonists; OD: Once daily; SGLT2: Sodium-glucose co-transporter 2; SU: Sulphonylurea; TID: Three times a day; TZD: Thiazolidinedione; T2DM: Type 2 diabetes mellitus. Hassanein *et al.*[2]

Insulin therapy

Switch to insulin analogues where possible

- **Long- or intermediate-acting basal insulin:**
 - OD – NPH*/detemir/glargine/degludec. Take at iftar. Reduce dose by 15–30%
 - BID – NPH/detemir/glargine. Take usual morning dose at iftar. Reduce evening dose by 50% and take at suhoor
- **Rapid- or short-acting prandial/bolus insulin:**
 - Take normal dose at iftar. Omit lunch-time dose. Reduce suhoor dose by 25–50%
- **Premixed insulin:**
 - OD – Take normal dose at iftar
 - BID – Take usual morning dose at iftar. Reduce evening dose by 25–50% and take at suhoor
 - TID – Omit afternoon dose. Adjust iftar and suhoor doses

Dose titration should be performed every three days and dose adjustments made according to BG levels

Fasting/Pre-iftar/Pre-suhoor BG	Post-iftar**/Post-suhoor***		
	Pre-iftar**	Short-acting insulin	Premixed insulin
< 70 mg/dL (3.9 mmol/L) or symptoms	Basal insulin Reduce by 4 units	Reduce by 4 units	Reduce by 4 units
70–90 mg/dL (3.9–5.0 mmol/L)	Reduce by 2 units	Reduce by 2 units	Reduce by 2 units
90–126 mg/dL (5.0–7.0 mmol/L)	No change required	No change required	No change required
126–200 mg/dL (7.0–11.1 mmol/L)	Increase by 2 units	Increase by 2 units	Increase by 2 units
> 200 mg/dL (11.1 mmol/L)	Increase by 4 units	Increase by 4 units	Increase by 4 units

- **Insulin pump:**
 - Basal rate – Reduce dose by 20–40% in the last 3–4 h of fasting. Increase dose by 0–30% early after iftar
 - Bolus rate – Normal carbohydrate counting and insulin sensitivity principles apply

Figure 2

Insulin dose modifications for patients with diabetes. *Alternatively, reduced neutral protamine Hagedorn dose can be taken at suhoor or at night; **adjust the insulin dose taken before suhoor; ***adjust the insulin dose taken before iftar. BG: Blood glucose; BID: Twice daily; NPH: Neutral protamine Hagedorn; OD: Once daily; TID: Three times a day. Hassanein *et al.*[2]

Ramadan fast and cardiovascular patients

A recent systematic review and meta-analysis showed that Ramadan fasting is not associated with the risk of developing acute cardiovascular events.[10] It is safe for patients with controlled high blood pressure to fast and it is recommended that they consult their PCPs few weeks before Ramadan to adjust their medications, if needed.[11] In general, long-acting antihypertensive medications, which are taken at the iftar or suhoor meals, are the best strategy to manage hypertension in fasting patients.[12] However, diuretics are not recommended as a new antihypertensive medication, especially during summer. It is also important for these patients to maintain a low-salt low-fat diet.[11,13,14] Patients who take oral anticoagulants (e.g., warfarin) can continue their treatment without the fear of developing adverse outcomes due to fasting.[11,15,16]

On the other hand, noncompliant hypertensive patients, individuals with unstable angina, decompensated heart failure, recent cardiac intervention or surgery, or recent myocardial infarction should follow the medical advice on not fasting Ramadan.[11]

While some studies suggest that Ramadan fasting results in reduction in total cholesterol and LDL-C levels and a slight decrease in triglycerides levels,[17,18] the evidence about the effects of fasting Ramadan on lipid profile is inconclusive.[11]

Patients with dyslipidemia should be counseled on eating a healthy low-fat (both saturated and trans-fat) diet adapted to their personal and cultural preferences.[19] Those on stable dose of statins may continue taking their medication during Ramadan, while newly prescribed statins may not be recommended as their side effects may negatively affect the fast.[19]

General advice for fasting

- Avoid dehydration during fasting, especially when Ramadan occurs in hot seasons, by drinking ample amount of fluids between sunset (iftar) and dawn (suhoor).
- Maintain a well-balanced, healthy diet that is rich in fibers and low in salt and glycemic index.
- People who would like to exercise are encouraged to do so after sunset (iftar) time
- Have structured and consistent lifestyle modifications in order to avoid rapid weight gain after Ramadan

Fasting Ramadan can have an effect on one's health and disease management. Therefore, it is important to be knowledgeable about the basics of Ramadan, exemptions from fasting, treatments and procedures that invalidate fasting, and the effects of fasting on managing diabetes, cardiovascular and other common diseases.

REFERENCES

1. Al-Munajjid SM. Things that Invalidate the Fast. Available from: <http://www.islam-qa.com/>
2. Al-Munajjid SM. If a Person Cannot Help Vomiting then Some of the Vomit Goes Back into His Stomach Unintentionally, that Does Not Invalidate His Fast. Available from: <http://www.islam-qa.com/>
3. Al-Munajjid SM. He Needs to Have an Injection into a Vein – Will that Affect His Fast? Available from: <http://www.islam-qa.com/>
4. Al-Munajjid SM. Effect of Medicines and Medical Treatments on Fasting. Available from: <http://www.islam-qa.com/>
5. Al-Munajjid SM. Ruling on Nicotine Patches. Available from: <http://www.islam-qa.com/>
6. Al-Munajjid SM. Types of Asthma Medication and the Ruling on Taking Them during the Day in Ramadan Available from: <http://www.islam-qa.com/>
7. Al-Munajjid SM. Insulin Injections Taken by a Diabetic Do Not Invalidate the Fast. Available from: <http://www.islam-qa.com/>

8. Salti I, Bénard E, Detournay B, Bianchi-Biscay M, Le Brigand C, Voinet C, et al. A population-based study of diabetes and its characteristics during the fasting month of Ramadan in 13 countries: Results of the epidemiology of diabetes and Ramadan 1422/2001 (EPIDIAR) study. *Diabetes Care*. 2004;27:2306–11. [[PubMed](#)] [[Google Scholar](#)]
9. Hassanein M, Al-Arouj M, Hamdy O, Bebakar WM, Jabbar A, Al-Madani A, et al. Diabetes and Ramadan: Practical guidelines. *Diabetes Res Clin Pract*. 2017;126:303–16. [This article is an excellent and comprehensive reference about caring for patients with diabetes in Ramadan] [[PubMed](#)] [[Google Scholar](#)]
10. Turin TC, Ahmed S, Shommu NS, Afzal AR, Al Mamun M, Qasqas M, et al. Ramadan fasting is not usually associated with the risk of cardiovascular events: A systematic review and meta-analysis. *J Family Community Med*. 2016;23:73–81. [[PMC free article](#)] [[PubMed](#)] [[Google Scholar](#)]
11. Chamsi-Pasha M, Chamsi-Pasha H. The cardiac patient in Ramadan. *Avicenna J Med*. 2016;6:33–8. [This article provides a comprehensive review about caring for patients with cardiovascular diseases in Ramadan] [[PMC free article](#)] [[PubMed](#)] [[Google Scholar](#)]
12. Beshyah SA, Fathalla W, Saleh A, Al Kaddour A, Noshi M, Al Hateethi H, et al. Ramadan fasting and the medical patient: An overview for clinicians. *Ibnosina J Med Biomed Sci*. 2010;2:240–57. [[Google Scholar](#)]
13. Guidelines for Management of Hypertension in Primary care Settings and Outpatient Clinics in the Kingdom of Bahrain. Bahrain: Ministry of Health, Health Promotion Council; 2008. Hypertension during Ramadan and Hajj; pp. 35–6. [[Google Scholar](#)]
14. Saudi Hypertension Management Group. Saudi Hypertension Management Guidelines, 2007: Executive Summary/Saudi Arabia. Riyadh: Saudi Hypertension Management Group; 2007. pp. 26–7. [[Google Scholar](#)]
15. Skaik Y, Chamsi-Pasha H. The effects of fasting in Muslim patients taking warfarin: Comment. *J Thromb Haemost*. 2014;12:807–8. [[PubMed](#)] [[Google Scholar](#)]
16. Saour JN, Sieck J, Khan M, Mammo L. Does Ramadan fasting complicate anticoagulation therapy? *Ann Saudi Med*. 1989;9:538–40. [[Google Scholar](#)]
17. Rouhani MH, Azadbakht L. Is Ramadan fasting related to health outcomes? A review on the related evidence. *J Res Med Sci*. 2014;19:987–92. [[PMC free article](#)] [[PubMed](#)] [[Google Scholar](#)]
18. Kul S, Savas E, Öztürk ZA, Karadag G. Does Ramadan fasting alter body weight and blood lipids and fasting blood glucose in a healthy population? A meta-analysis. *J Relig Health*. 2014;53:929–42. [[PubMed](#)] [[Google Scholar](#)]

19. Slim I, Ach K, Chaieb L. Lipid management in Ramadan. *J Pak Med Assoc.* 2015;65(5 Suppl 1):S57–61. [[PubMed](#)] [[Google Scholar](#)]