

# Muslim patients in Ramadan: A review for primary care physicians

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## ABSTRACT

Fasting Ramadan, in which Muslims abstain from specific habits and behaviors from dawn to sunset, is one of the five Pillars of Islam. While there are several exemptions from fasting, many Muslim patients with acute or chronic medical conditions still choose to fast, which may adversely affect their health if not addressed properly. Some patients may not be well educated about the effects of some medical treatments and procedures on the validity of their fast, which can unnecessarily lead to suboptimal management of their conditions or treatment nonadherence. Since spirituality, religiosity, and personal beliefs affect patients' health behaviors and adherence to treatments, health-care providers need to learn how fasting Ramadan can affect the health of their Muslim patients, especially those with chronic medical conditions, and how to help them achieve safe fasting. This article aims to provide an overview of the main topics that primary care physicians may need to know in order to improve their cultural competence when caring for their fasting Muslim patients.

**Key words:** Fasting, Muslim patients, primary care, Ramadan

## INTRODUCTION

Fasting "Sawm" the 9<sup>th</sup> Islamic month "Ramadan" is one of the five fundamental Pillars of Islam. Following a lunar calendar (355 days/year), Ramadan moves back each year by 10 days, which means it can occur in any of the four seasons, resulting in variations in the number of fasting hours.<sup>[1,2]</sup>

Pew Research Center estimated that Muslims accounted for 23% of the world population (1.6 billion) in 2010.<sup>[3]</sup> Millions of adult Muslims worldwide observe fasting the holy month of Ramadan each year. They should refrain from food, drinking water or any beverages, and smoking from dawn till sunset for 29–30 days.<sup>[4]</sup> Married couples also refrain from sexual intercourse while fasting.<sup>[4]</sup> During Ramadan, Muslims usually eat 2 meals a day: one when they end their daily fast at sunset, known as iftar, and the other is a light meal before the break of the dawn, known as suhoor.<sup>[5]</sup> In addition to the changes in their dietary habits, sleep patterns of Muslims also change during Ramadan

including prolongation of the awakening hours during night and changes to the rapid eye movement sleep.<sup>[1,6-8]</sup>

Spirituality, religiosity, and personal beliefs are important components of the social determinants that affect patients' health behaviors and adherence to treatments.<sup>[9-12]</sup> To address these aspects and to ensure the delivery of culturally competent care, it is important for health-care providers to have a basic understanding of how Islamic teachings, including intermittent fasting, shape their Muslim patients' health, especially those with chronic medical conditions.<sup>[13]</sup>

## BENEFITS OF FASTING THE HOLY MONTH

Fasting Ramadan improves spiritual and physical health.<sup>[14-16]</sup> The main purpose of fasting the holy month

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is to attain righteousness.<sup>[17]</sup> Some other benefits include strengthening the believers' relationship with their Creator (His name is Allah), having self-reflection and appreciation of Allah's blessings, remembering and helping the people in need, and learning self-control.<sup>[1,14]</sup> Many Muslim individuals also consider this holy month a great opportunity to make healthy changes to their lifestyles because it is, if practiced correctly, an annual training in appetite control and having a balanced diet, which can help in losing weight.<sup>[16,18,19]</sup> In addition, Ramadan can be an ideal time for many individuals to quit smoking, an action that breaks fasting and a habit that is prohibited in Islam according to the vast majority of Muslim scholars, with the need of continuous support after Ramadan to prevent relapse.<sup>[1,14,20]</sup>

## EXEMPTIONS FROM FASTING RAMADAN

In Islam, there are several excuses for not fasting Ramadan, including prepubertal children, women during their menstrual period or postnatal bleeding, travelers, pregnant or breastfeeding women who believe fasting for long hours may cause harm to either themselves or their babies,<sup>[21]</sup> the elderly who cannot tolerate fasting, the mentally disabled and the sick whom fasting will aggravate their condition.<sup>[15,21-24]</sup> However, 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.<sup>[2]</sup> With careful support and advice, along with shared decision-making regarding treatment plans, successful health outcomes and safe fasting can be achieved.

## TREATMENTS AND PROCEDURES THAT INVALIDATE OR DO NOT INVALIDATE FASTING

Both Muslim and non-Muslim PCPs may encounter fasting Muslim patients who refuse, or do not adhere, to take a specific prescribed medication or have a specific procedure during Ramadan, thinking that it would invalidate their fast. For example, a cross-sectional survey among Muslims in Mumbai, India,<sup>[25]</sup> showed that most of the respondents in the study believe that using eye drops during fasting hours of Ramadan would break the fast and about a third of them would not use drops for a painful eye condition during the fasting period, although eye drops do not invalidate fasting as long as the patient does not feel the taste as will be mentioned later on. This indicates that Ramadan could be an important cause for noncompliance with prescribed

medications. Therefore, it is important for PCPs to know the main medication types, conditions, and procedures that may or may not invalidate fasting in order to have an informed discussion with their Muslim patients.

Many things that come into or out of the body invalidate fasting, such as intentional eating or drinking, oral medications that reach the stomach, deliberate vomiting, sexual intercourse, parenteral nutrition, and others.<sup>[26-29]</sup> It is important, however, to realize that Muslim scholars differed in considering some behaviors or procedures a reason to invalidate fasting or not due to slightly different juristic opinions and understanding of the Islamic texts. For instance, while the Islamic Fiqh Council, an affiliate of the Muslim World League that is made up of a select group of Muslim jurists and scholars from many countries, issued a fatwa that ear and nose drops do not break the fast as long as one avoids swallowing any material that may reach the throat,<sup>[29]</sup> other group of scholars consider these drops a reason for invalidating the fast regardless.<sup>[30]</sup> Rectal suppositories, enema, and blood donation are other examples of things that may or may not invalidate fasting according to different scholars, but consensus is lacking.<sup>[30-32]</sup> Therefore, it is better to schedule the procedure or take the medication during nonfasting hours, if possible, and it is important to acknowledge the different opinions and needs of Muslim patients who may follow different juristic schools and fatwas. Knowing these differences can also help PCPs explain to their Muslim patients all possible options using culturally competent information. 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 in Saudi Arabia that issues rulings in Islamic jurisprudence.<sup>[26-29,33-35]</sup>

## GENERAL ADVICE FOR ALL FASTING PATIENTS

A preRamadan medical assessment and education to all Muslim patients, who are willing to fast, would be helpful to achieve safe fasting.<sup>[38]</sup> Avoiding dehydration during fasting should be emphasized, especially when Ramadan occurs in hot seasons, by drinking ample amount of fluids between iftar and suhoor.<sup>[5]</sup> It is also highly recommended to maintain a well-balanced, healthy diet that is rich in fibers and low in salt and glycemic index.<sup>[5,38,39]</sup> People who would like to exercise are encouraged to do so after iftar time.<sup>[1]</sup> Although some fasting Muslims lose weight, regaining weight is commonly seen few weeks after Ramadan.<sup>[1,16,40-42]</sup> Therefore, individuals should be encouraged to have structured and

**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<sup>[26-29,33-35]</sup>**

Treatments and procedures that do not invalidate fasting*	Notes
<p><b>Islamic Fiqh Council</b></p> <ul style="list-style-type: none"> <li>• Eye drops</li> <li>• Ear drops</li> <li>• Ear syringing</li> <li>• Nasal sprays</li> <li>• Nasal drops</li> <li>• Sublingual tablets or lozenges (for angina pectoris)</li> <li>• Drilling of teeth (prior to filling)</li> <li>• Extraction or polishing of teeth</li> <li>• Using a toothbrush or miswak</li> <li>• Rinsing, gargling or applying topical treatment in the mouth</li> </ul> <p>-----</p> <ul style="list-style-type: none"> <li>• Injections (subcutaneous, intramuscular and intravenous)</li> <li>• Vaginal pessaries</li> <li>• Douching</li> <li>• Use of speculum</li> <li>• Pelvic exam</li> <li>• Placing Intra Uterine Devices (IUDs)</li> <li>• Urine catheters</li> <li>• Dye injection for diagnostic imaging</li> <li>• Oxygen</li> <li>• Creams, lotions and patches</li> <li>• Nicotine patches that are used for quitting smoking</li> <li>• Endoscopy without an administration of solutions or other substances</li> </ul> <p><b>The Standing Committee for Academic Research and Issuing Fatwas</b></p> <ul style="list-style-type: none"> <li>• Involuntary vomiting including morning sickness due to pregnancy</li> <li>• Involuntary nose bleeding</li> <li>• Insulin injections***</li> <li>• Puffers and oxygen used for asthma treatment****</li> <li>• Vaccinations (intramuscular route)</li> </ul>	<p>As long as the fasting patient does not feel the taste in the throat or swallow any residue</p> <p>If the treatment or procedure is not urgently needed, it would be recommended to take/schedule it before or after fasting hours</p>
<p><b>Treatments and procedures that invalidate fasting **</b></p> <p><b>Islamic Fiqh Council</b></p> <ul style="list-style-type: none"> <li>• Oral medication during fasting hours</li> <li>• Parenteral nutrition</li> </ul> <p><b>The Standing Committee for Academic Research and Issuing Fatwas</b></p> <ul style="list-style-type: none"> <li>• Deliberate vomiting</li> <li>• Kidney dialysis</li> </ul>	
<p>*The following things do not invalidate fasting according to some Muslim scholars, not committees: blood tests, rectal suppositories, enema, and bleeding from hemorrhoids.<sup>[31,32,36,37]</sup></p> <p>**The following things invalidate fasting according to some Muslim scholars, not committees: donating blood, blood transfusion, and cupping.<sup>[36]</sup> ***There is a common misconception among both Muslim patients and PCPs that insulin injections and monitoring blood glucose would invalidate fasting.<sup>[13,35,38]</sup> ****Vaporizers and capsules that are used for asthma treatment invalidate fasting and the patient should make up that day after Ramadan.<sup>[34]</sup></p>	

consistent lifestyle modifications in order to avoid rapid weight gain after Ramadan.<sup>[1,40]</sup>

### Ramadan fast and diabetic patients

There are about 90 million Muslims who have diabetes worldwide.<sup>[43]</sup> Although most Muslim scholars and physicians recommend against fasting for patients with uncontrolled diabetes,<sup>[2,15]</sup> 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.<sup>[44]</sup> This suggests that management of fasting diabetic patients is an essential, but challenging, topic that PCPs need to know.

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.<sup>[2]</sup> 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.<sup>[2]</sup> 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.<sup>[2]</sup> In addition, diabetic patients should be counseled on the

**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.<sup>[2]</sup> with permission)**

Risk category and religious opinion on fasting <sup>a</sup>	Patient characteristics	Comments
Category 1: very high risk  Listen to medical advice MUST NOT fast	One or more of the following: <ul style="list-style-type: none"> <li>• Severe hypoglycemia within the 3 months prior to Ramadan<sup>b</sup></li> <li>• Unexplained DKA within the 3 months prior to Ramadan</li> <li>• Hyperosmolar hyperglycemic coma within the 3 months prior to Ramadan</li> <li>• History of recurrent hypoglycemia</li> <li>• History of hypoglycemia unawareness</li> <li>• Poorly controlled T1DM</li> <li>• Acute illness</li> <li>• Pregnancy in pre-existing diabetes, or GDM treated with insulin or SUs</li> <li>• Chronic dialysis or CKD stage 4 &amp; 5</li> <li>• Advanced macrovascular complications</li> <li>• Old age with ill health</li> </ul>	If patients insist on fasting, then they should: <ul style="list-style-type: none"> <li>• Receive structured education</li> <li>• Be followed by a qualified diabetes team</li> <li>• Check their blood glucose regularly (SMBG)</li> <li>• Adjust medication dose as per recommendations</li> <li>• Be prepared to break the fast in case of hypo- or hyperglycemia</li> <li>• Be prepared to stop the fast in case of frequent hypo- or hyperglycemia or worsening of other related medical conditions</li> </ul>
Category 2: high risk Listen to medical advice Should NOT fast	One or more of the following: <ul style="list-style-type: none"> <li>• T2DM with sustained poor glycemic control<sup>c</sup></li> <li>• Well-controlled T1DM</li> <li>• Well-controlled T2DM on MDI or mixed insulin</li> <li>• Pregnant T2DM or GDM controlled by diet only or metformin</li> <li>• CKD stage 3</li> <li>• Stable macrovascular complications</li> <li>• Patients with comorbid conditions that present additional risk factors</li> <li>• People with diabetes performing intense physical labor</li> <li>• Treatment with drugs that may affect cognitive function</li> </ul>	
Category 3: moderate/low risk  Listen to medical advice Decision to use licence not to fast based on discretion of medical opinion and ability of the individual to tolerate fast	Well-controlled T2DM treated with one or more of the following: <ul style="list-style-type: none"> <li>o Lifestyle therapy</li> <li>o Metformin</li> <li>o Acarbose</li> <li>o Thiazolidinediones</li> <li>o Second-generation SUs</li> <li>o Incretin-based therapy (DPP-4 inhibitors or GLP-1 RAs)</li> <li>o SGLT2 inhibitors</li> <li>o Basal insulin</li> </ul>	Patients who fast should: <ul style="list-style-type: none"> <li>• Receive structured education</li> <li>• Check their blood glucose regularly (SMBG)</li> <li>• Adjust medication dose as per recommendations</li> </ul>

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. <sup>a</sup>In all categories: people with diabetes should follow medical opinion if the advice is not to fast due to high probability of harm. <sup>b</sup>Hypoglycemia that is not due to accidental error in insulin dose. <sup>c</sup>The level of glycemic control is to be agreed upon between doctor and patient according to a multitude of factors

warning signs of hypoglycemia and what should be done if any of them occurs.<sup>[2]</sup> 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.<sup>[38]</sup>

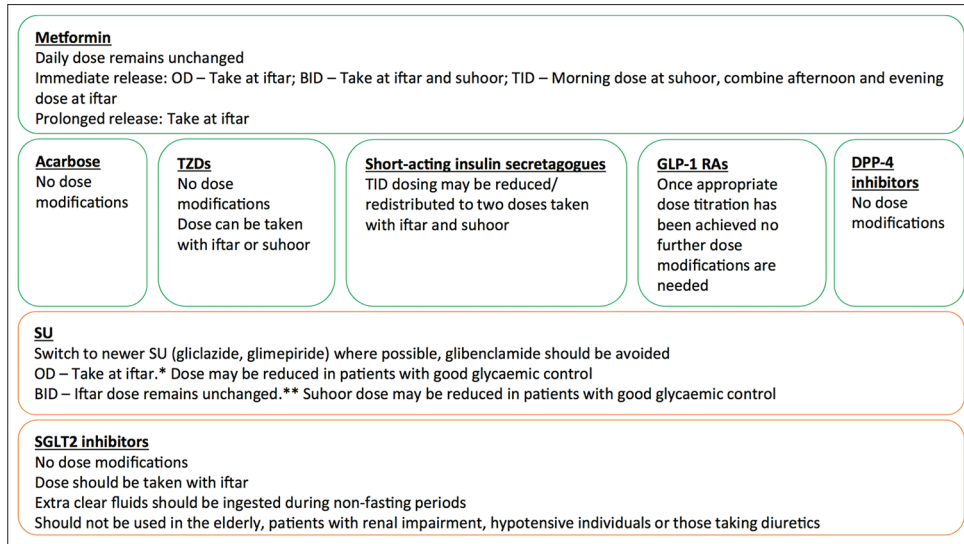
Modifying the dose of antihyperglycemic medications is an essential component of managing patients with diabetes in Ramadan. Figure 1 describes the dose modification of noninsulin hypoglycemic agents for patients with Type 2 diabetes mellitus, while Figure 2 describes the dose modification of insulin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

### Ramadan fast and cardiovascular patients

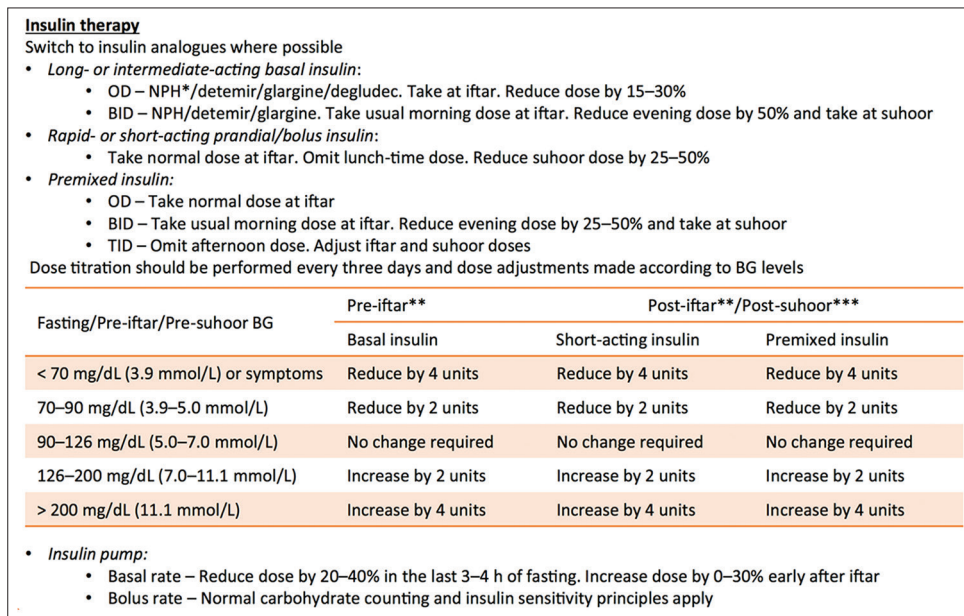
A recent systematic review and meta-analysis showed that Ramadan fasting is not associated with the risk of developing acute cardiovascular events.<sup>[7]</sup> It is safe for patients with

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.<sup>[1]</sup> 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.<sup>[45]</sup> 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.<sup>[1,46,47]</sup> Patients who take oral anticoagulants (e.g., warfarin) can continue their treatment without the fear of developing adverse outcomes due to fasting.<sup>[1,48,49]</sup>

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.<sup>[1]</sup>



**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. Obtained from Hassanein *et al.*<sup>[2]</sup> with permission



**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. Obtained from Hassanein *et al.*<sup>[2]</sup> with permission

While some studies suggest that Ramadan fasting results in reduction in total cholesterol and LDL-C levels and a slight decrease in triglycerides levels,<sup>[16,18]</sup> the evidence about the effects of fasting Ramadan on lipid profile is inconclusive.<sup>[1]</sup>

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.<sup>[50]</sup> 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.<sup>[50]</sup>

**Ramadan fast and gastrointestinal health**

Symptoms of dyspepsia, including bloating, indigestion, and heartburn, are common in fasting patients, especially who practice unhealthy eating habits, such as excessive eating during iftar or suhoor meals.<sup>[51]</sup> Patients should be advised to eat moderately and avoid foods that can trigger these symptoms.<sup>[51]</sup>

Patients with active peptic ulcers should be advised not to fast because of their higher probability of developing complications.<sup>[15]</sup> On the other hand, patients with nonactive peptic ulcers can fast with using proton pump inhibitors, between iftar and suhoor, when needed.<sup>[15]</sup> Patients with stable inflammatory bowel disease or chronic hepatitis may also be able to fast without negative consequences on their health.<sup>[51]</sup>

### Ramadan fast and patients with renal diseases

Fluid restriction and the possible dehydration during fasting hours in Ramadan may raise a special concern about the health of patients with renal diseases. Few studies with inconclusive results are available on the effect of fasting on chronic kidney disease (CKD), but many physicians are concerned that fasting can cause deterioration in the situation of patients with CKD.<sup>[52,53]</sup> Therefore, a careful assessment and continuous monitoring of the kidney function should be performed before and during Ramadan to determine the ability of these patients to fast. Patients who have alarming symptoms, significant changes in kidney function, or acute tubular necrosis should not fast.<sup>[52,53]</sup>

Although one study showed an increase in hospital admissions due to renal colic in Ramadan,<sup>[54]</sup> other studies have failed to prove such an association<sup>[55-57]</sup> and the evidence about the role of fasting Ramadan in inducing renal stones formation is inconclusive.<sup>[53]</sup> It should be recognized, however, that many of these studies were conducted during Ramadan falling in cold seasons, not hot seasons.<sup>[52]</sup> Despite that, almost all studies and physicians agree on the importance of drinking adequate amount of water during nonfasting hours in Ramadan (i.e., between iftar and suhoor) to pass about 2 L of urine in a 24-h cycle in order to reduce the potential risk of developing renal colic in patients with urolithiasis, especially in hot seasons.<sup>[52,53]</sup> In addition, it is important for these patients to monitor their consumption of proteins and limit the amount of vitamin C, sodium, and high-oxalate food (e.g., spinach, bran flakes, rhubarb, beets, potato chips, French fries, nuts, and nut butters) in their diet.

Studies have shown that fasting Ramadan is safe for recipients of kidney transplant when the graft function is acceptable and stable.<sup>[52,53,58-60]</sup> Therefore, these patients can fast under medical supervision and continuous assessment of their graft function. Immunosuppressive medications, when prescribed, can be divided into two doses: at suhoor and iftar.

### CONCLUSION

Fasting Ramadan can have an effect on Muslim patients' health and disease management. Therefore, it is important for PCPs to be culturally competent and knowledgeable

about the basics of Ramadan, exemptions from fasting, treatments and procedures that invalidate fasting, and the effects of fasting on managing patients with diabetes, cardiovascular, gastrointestinal, renal, and other common diseases. While clear guidelines are not always available for managing all diseases, an individualized approach is needed in treating fasting Muslim patients during Ramadan.

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