Corporate Pharmacy Department
Drug Information Center

Medication Management During Ramadan

Muslims are obliged to participate in an intermittent fasting and refrain from eating from dawn to sunset for a month, unless they are advised not to fast. In Qatar, fasting duration ranges between 9 and 15 hours. The first meal in the day is just before the dawn (Suhoor), while the second meal is immediately after the sunset (Iftar). Fasting Muslims are expected to take their medication between Iftar and Suhoor. Healthcare Providers (HCPs) should be aware about the effect of the drug modification on the disease management.

Physiological and pharmacokinetic changes:

Gastro-intestinal tract:

During fasting, the gastric pH significantly decreases up to 1, resulting in an increased gastro-intestinal disturbance of drugs that are taken on an empty stomach. Such drugs are advised to be taken before Suhoor. Drugs that are taken after food are advised to be taken 1 hour after the main meal (Iftar), allowing normalization of the pH.

Urinary excretion:

Drug excretion is not expected to be altered in patients with normal renal function, including patients with renal transplant. However, patients with chronic kidney disease are more likely to have adverse outcomes secondary to dehydration and decreased drug excretion.

Liver and Cytochrome P 450 (CYP 450):

Short-term fasting alter CYP450-mediated drug metabolism, which might lead to altered (increased/decreased) hepatic metabolism during Ramadan. However, these findings are inconclusive and further research is needed. Therefore, patients with hepatic impairment are managed on individual bases (clinical judgment).

Challenges faced by HCPs during Ramadan

High risk patients:

High risk patients, such as type 1 diabetes and heart failure patients, who insist to fast, pose a great challenge to the HCPs in the management of their disease. Structured education and pre-Ramadan medication management planning is crucial.

Fasting without HCPs awareness:

Patients arbitrarily change their drug regimen without seeking medical advice, e.g. they:

- stop their medications
- modify the timing of administration/intake
- change the frequency change the total daily dosage
- take their total daily dose in one intake.

Knowledge about patient practices regarding their medication use in Ramadan is paramount. Such modifications may result in significant drug-drug or drug-food interactions and abnormal drug levels, and may results in serious adverse outcomes. Patients may not disclose this issue if not discussed. Therefore, HCPs are advised to be proactive and initiate this conversation with their patient to ensure a proper medication Ramadan management plan.

Special population

Pregnant and breastfeeding women

Pregnant and breastfeeding women are allowed to fast if they are healthy, unless they are advised not to fast such as pregnancy with diabetes, hypertension, or anemia and mothers with exclusively breastfed babies aged less than 6 months. Pregnant and breastfeeding women are advised to take a healthy diet, to keep hydrated and to seek medical opinion if they experienced any of the following symptoms: dizziness, palpitations, severe headache, fever, nausea or start vomiting, vision disorders, weakness, decreased fetal movement while fasting.

Elderly patients

Elderly patients are prone to dehydration during long fasting hours that might affect their kidney function. Also, they are likely to have a polypharmacy. Pre-Ramadan planning and careful distribution of their medication is important.

Pediatrics

Fasting becomes obligatory for pediatrics at puberty. Children are trained to fast gradually at an earlier age. Because of increased metabolic needs and water loss due to large surface area, it is advised to keep hydrated (drink 30 ml/kg of water) during fasting break hours. On the other hand, they should not fast if they use chronic medications as it might negatively affect their disease status.

Disease	Drug/category	Specification	Recommendation
Hypertension	**BB**: e.g. Bisoprolol	OD	Take after Suhoor
	BB: e.g. Metoprolol	BID	Take after Iftar and Suhoor
	ACEs & ARBs	OD - Monitor for postural hypotension e.g. dizziness	Take after Ishaa praying
	CCBs	Dihydropyridine e.g. amlodipine or nifedipine	Take after Iftar or Suhoor
		Non–dihydropyridine e.g. verapamil and diltiazem	Take after Suhoor due to the circadian effect of the drug
	Thiazide diuretics	OD - might cause dehydration	Take after Ishaa prayer
	Alpha blocker	OD - Monitor for postural hypotension e.g. dizziness	Take after Ishaa praying
	Hydralazine	Every 6 or 8 hours	Option 1: Take the total dose in two divided doses, monitor blood pressure Option 2: Change the drug
Coronary Artery Disease	**Antiplatelet** e.g. aspirin, clopidogrel and prasugrel	OD - Aspirin and clopidogrel Increased resistance in diabetic patients during fasting	take after the full Iftar meal (to avoid the stomach irritation) Strict adherence is recommended
	Antiplatelet e.g. ticagrelor	BID	After Iftar and Suhoor Interval between doses should not be less than 8 hours
	Contrast media after angioplasty	Increase risk of contrast induced nephropathy due to dehydration	Advise not to fast
	Nitrates (MR) e.g. Isosorbide dinitrate	Monitor for postural hypotension	Take after Ishaa praying or after Suhoor
	Nitrates (IR) e.g. Isosorbide dinitrate	BID	Option 1: Convert to long acting Option 2: Take after Iftar & Suhoor
	Nitrates (IR) e.g. Isosorbide dinitrate	TID	Distribute the total dose in to BID
Arrhythmia	Amiodarone	Patient are sensitive to electrolyte disturbance	Take after full Iftar meal.
	Mexiletine	TID - Patient are sensitive to electrolyte disturbance e.g. K & Mg	Fasting is not recommended
	Flecainide	BID	Take after Iftar and Suhoor Interval between doses should not be less than 8 hours
	Sotalol		
	Oral electrolyte replacement	OD	Preferred after Suhoor
		BID	Take after iftar & suhoor
Heart Failure	**Loop Diuretics**	alone	Take after Ishaa prayer
		Combined with thiazides	Advise not to fast. Monitor for significant dehydration and electrolyte disturbance
		Spironolactone	Take after Iftar or Suhoor
	Digoxin	Monitor for toxicity secondary to hypokalemia and dehydration	Take after Suhoor
Coagulation disorders	Warfarin	OD - Take the dose in the same time every day	Take after main Iftar Monitor INR frequently
	Rivaroxaban	OD	Take after full Iftar meal
	Dabigatran	BID - Might increase GI disturbance with the Iftar dose	Take after full Iftar and Suhoor Interval should be ≥ 8 hours
	Apixaban	BID	Take after full Iftar and Suhoor Interval should be ≥ 8 hours
Hyperlipidemia	Atorvastatin and Rosuvastatin (Long acting)	OD	Take after Iftar or Suhoor
	Simvastatin and Pravastatin (short acting)	OD	Take before bedtime
	Fibrates	During fasting, risk of rhabdomyolysis might increase if used in combination with statins due to dehydration and dehydration during fasting	Take after Iftar Monitor muscle pain
	Ezetimibe	OD	Take after full Iftar or Suhoor
Epilepsy	Carbamazepine (IR)	Should be taken at least twice daily	Option 1: convert to CR formula Option 2: Redistribute total daily dose into BID dose and take after food
	Carbamazepine (MR)	Initiation OD	Take after iftar or Suhoor
		Initiation BID	Take after iftar and Suhoor
		Maintenance BID	
	Benzodiazepines	OD or PRN doses	Take after Iftar (preferred after Ishaa pray)
	Sodium Valproate	Regular formulation - BID	Take after Iftar and Suhoor
		Chrono – OD or BID	Take after Iftar and/or Suhoor
	Oxcarbazepine	BID	Take after Iftar and Suhoor
	Topiramate		
	Pregabalin		
	Levetiracetam		
	Lamotrigine (IR)	Initiation OD or BID	Clinical judgment. Take after Iftar and/or suhoor
		Maintenance BID	Take after iftar and suhoor
	Lamotrigine (MR)	OD	Take after Iftar or Suhoor
	Phenytoin	BID	Take after iftar and suhoor
		TID	Clinical judgment
Asthma	**Inhalers**	Advise to avoid food that can trigger asthma symptoms such as peanuts, milk, eggs, and wheat	No dose change, Does **NOT** invalidate the fast, Stay hydrated
	Vaporizers **Capsule e.g. tiotropium**	PRN	No dose change, invalidate fasting
Diabetes on Oral Anti-diabetics	Metformin (IR)	OD: Daily dose remains unchanged	Take after Iftar
		BID: Daily dose remains unchanged	Take after Iftar and Suhoor
		TID: Daily dose remains unchanged	Morning dose after Suhoor, combine afternoon & evening dose at Iftar
	Metformin (MR)	MR - Daily dose remains unchanged	Take after Iftar
	Acarbose		No dose modifications
	Pioglitazone, Rosiglitazone		No dose modifications. Dose can be taken with Iftar or Suhoor
	Repaglinide		Reduce TID dose to BID
	Exenatide & Liraglutide	Maintenance	No dose modification is needed
	Sitagliptin, Vildagliptin, and Saxagliptin		No dose modification is needed
	Sulfonyl Ureas e.g. Glibenclamide*, Gliclazide, and Glimepiride	OD *Glibenclamide should be avoided Switch to newer SU (Gliclazide, Glimepiride) where possible.	Take at Iftar Dose may be reduced in patients with good glycemic control
		BID *Glibenclamide should be avoided Switch to newer SU (Gliclazide, Glimepiride) where possible	Take at Iftar and Suhoor Iftar dose remains unchanged Suhoor dose may be reduced in patients with good glycemic control
	Dapagliflozin, and Canagliflozin		Take with Iftar No dose modifications Keep hydrated. Avoid in the elderly with renal impairment, hypotensive individuals or patient taking diuretics
Diabetes on Insulins*	**Long- or intermediate-acting basal insulin e.g.** NPH/Detemir/Glargine	OD	Take at Iftar. Reduce dose by 15–30%
		BID	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
Hypo-thyroid	Levothyroxine	OD	Should be taken 2 hours before the last meal and 30 minutes before the next meal.
Hyper-thyroid	Methimazole	OD	Take with main Iftar meal or Suhoor
		BID	Take with main Iftar meal and Suhoor
	Propylthiouracil		Clinical judgment

Acronyms: **ACEs:** Angiotensin converting enzyme inhibitors; **ARBs:** Angiotensin receptor inhibitors; **OD**: once daily; **BID**: Twice daily; **BB:** Beta blockers; **GI**: gastrointestinal; IR: Immediate release; MR: Modified release **PRN**: as needed; **TID**: three times daily. *Insulin dose modification is case dependent

- All above recommendations are based on the available literature and are subjected to physician approval.

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Drug Information Center (DIC)

Drug information center at HMC was established in April 2018 under the direction of Dr. Moza Al Hail, Executive Director Pharmacy, to promote the use of evidenced-based medicine, improve medication safety, and enhance patient-centered pharmaceutical care at HMC through practice, research and teaching.

Drug Information Center staff:	Drug Information Center services:
Dr. Palli Valapila Abdulrouf, Head of DIC Mrs. Yolande Hanssens, Co-Head of DIC Dr. Binny Thomas, DIC Coordinator Mr. Shaban Mohammed, DI specialist Mr. Mahmoud Mohamed, DI pharmacist Mr. Haseebur Rahman Mohammed, DI pharmacist Ms. Dina Abushanab, DI pharmacist	I. Provide specialist information to health care providers II. Maintain and update shared drug information database III. Coordinate adverse drug reaction monitoring with Medication safety office IV. Support and review HMC formulary and guidelines V. Support medical research center by reviewing research proposals VI. Support continuous education and training