

STANDARD TREATMENT WORKFLOW (STW)

Diabetes Mellitus Type 2

Anil Bhansali¹, Eesh Bhatia², B Ganpathi³, Maj Gen Narendra Kotwal⁴, Rajesh Rajput⁵,
Ravinder Goswami⁶, Subhankar Choudhary⁷, V Mohan⁸

¹Postgraduate Institute of Medical Education and Research, Chandigarh; ²Sanjay Gandhi Post Graduate Institute of Medical Sciences, Lucknow; ³St John's Medical College Hospital, Bengaluru; ⁴Army Hospital Research and Referral, New Delhi; ⁵Pandit Bhagwat Dayal Sharma Post Graduate Institute of Medical Sciences, Rohtak; ⁶All India Institute of Medical Sciences, New Delhi; ⁷Institute of Post-Graduate Medical Education and Research, Kolkata; ⁸Dr. Mohan's Diabetes Specialities Centre, Chennai

CORRESPONDING AUTHOR

Dr. Anil Bhansali, Department of Endocrinology, Postgraduate Institute of Medical Education and Research, Chandigarh

Email: anilbhansali_endocrine@rediffmail.com

CITATION

Bhansali A, Bhatia E, Ganpathi B, Kotwal N, Rajput R, Goswami R, Choudhary S, Mohan V. Diabetes Mellitus Type 2. Journal of the Epidemiology Foundation of India. 2024;2(1Suppl):S109-S110.

DOI: <https://doi.org/10.56450/JEFI.2024.v2i1Suppl.055>

This work is licensed under a Creative Commons Attribution 4.0 International License.

©The Author(s). 2024 Open Access

DISCLAIMER

This article/STW, was originally published by Indian Council of Medical Research (ICMR) under Standard Treatment Workflow. The reprinting of this article in Journal of the Epidemiology Foundation of India (JEFI) is done with the permission of ICMR. The content of this article is presented as it was published, with no modifications or alterations. The views and opinions expressed in the article are those of the authors and do not necessarily reflect the official policy or position of JEFI or its editorial board. This initiative of JEFI to reprint STW is to disseminate these workflows among Health Care Professionals for wider adoption and guiding path for Patient Care.

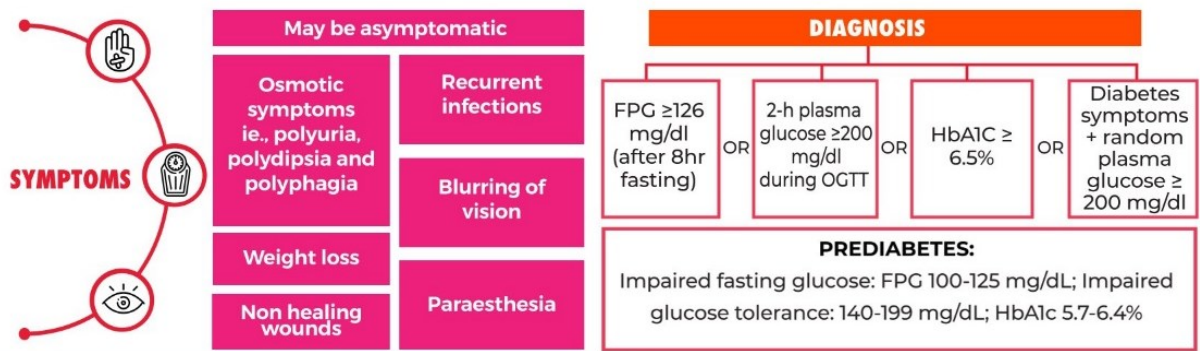
2024 / JEFI



Standard Treatment Workflow (STW)

DIABETES MELLITUS TYPE 2

ICD-10-E11



**Standard Treatment Workflow (STW)
DIABETES MELLITUS TYPE 2**

ICD-10-E11

SYMPTOMS

- May be asymptomatic
- Osmotic symptoms ie., polyuria, polydipsia and polyphagia
- Recurrent infections
- Blurring of vision
- Weight loss
- Non healing wounds
- Paraesthesia

DIAGNOSIS

FPG ≥126 mg/dl (after 8hr fasting) OR 2-h plasma glucose ≥200 mg/dl during OGTT OR HbA1c ≥ 6.5% OR Diabetes symptoms + random plasma glucose ≥ 200 mg/dl

PREDIABETES:
Impaired fasting glucose: FPG 100-125 mg/dL; Impaired glucose tolerance: 140-199 mg/dL; HbA1c 5.7-6.4%

ASSESS

CO-MORBIDITIES:	Hypertension Dyslipidaemia	CAD	CKD	EXAMINATION:	BMI waist circumference	BP	Peripheral pulses	Pin-prick sensation, monofilament test, vibration, DTR	Skin, oral cavity, foot	Fundus (dilated) examination
------------------------	-------------------------------	-----	-----	---------------------	-------------------------	----	-------------------	--	-------------------------	------------------------------

INVESTIGATION

- HbA1c
- Creatinine
- K⁺
- Fasting lipid profile
- Urine routine examination and spot albumin: creatinine ratio*
- LFT/ ALT, AST
- EKG
- Others like Echo, USG abdomen as indicated
- *These may best be carried out after initial glycaemic control

TREATMENT

- Dietary modification
- Avoidance of tobacco and restriction/ avoidance of alcohol
- Physical activity
- Pharmacotherapy:
 - HbA1c < 8.5%: Monotherapy- Metformin
 - HbA1c 8.5-10%: Dual therapy- Metformin + SU's/TZD/ DPPiV/SGLT2i /AGI/GLP-1RA
 - HbA1c > 10%: Basal Insulin+ Metformin + another OAD / triple OAD combination

METABOLIC TARGETS

- HbA1c <= 7.0% (except elderly and those with significant comorbid conditions) where higher target may be acceptable
- Pre-prandial capillary plasma glucose: 80-130 mg/dl
- Post-prandial capillary plasma glucose: <180 mg/dl
- BP=140/90 (130/80 in CKD) LDL: <100 mg/dl (< 70mg/dl in CAD)

MONITORING

- Blood glucose; FPG and 2 hours PPG once monthly more frequent as required including SMBG or CGM
- HbA1c every 6-12 months (3 monthly if uncontrolled)
- Annual monitoring : ECG, urine ACR (albumin creatinine ratio),dilated funduscopy,foot examination

REFERRALS

- Endocrinology: for uncontrolled hyperglycemia
- Ophthalmology: at initial evaluation and every year
- Nephrology: for deranged renal function
- Cardiology: for CAD/HF/arrhythmia

SCREENING FOR DIABETES MELLITUS

<p>IN AN APPARENTLY NORMAL ADULT</p> <ul style="list-style-type: none"> In obese or overweight (BMI ≥ 27.5 or ≥ 23 kg/m²) with any of the following risk factors First degree relative with diabetes History of cardiovascular disease BP (≥ 140/90 mmHg) Dyslipidemia (TG > 250 mg/dL, HDL <40 mg/dl in male, <50 mg/dl in female) Physical inactivity Polycystic ovary syndrome (PCOS) Insulin resistance (acanthosis nigricans) Adults > 30 years of age Previous history of GDM 	<p>IN AN ADULT WITH ILLNESS</p> <ul style="list-style-type: none"> In any adult/adolescent who presents with one of the following illness/complaints Osmotic symptoms (polyuria, polydipsia, polyphagia, nocturia) Unexplained weight loss Unexplained depression or dementia Acute coronary syndrome Deep seated infections (liver abscess, lower lobe pneumonia, tuberculosis, pyelonephritis, abscesses, septic arthritis, osteomyelitis) Recurrent infections (tinea, oral thrush, onychomycosis, cystitis-urinary tract infection, sinusitis, STI, cellulitis, carbuncle) Non-healing ulcers (foot ulcers-infected/neuropathic) Exogenous/iatrogenic Cushing's syndrome
<p>IN PREGNANCY</p> <ul style="list-style-type: none"> H/O GDM/Pre-existing diabetes All pregnant women to be screened in 1st trimester with FPG FPG ≥ 126 and/or HbA1c ≥ 6.5% to be considered pre-existing diabetes FPG between 92-125 to be considered as GDM All those women with normal screening in 1st trimester to get a 75 g-oral glucose tolerance test done at 24-28 weeks All GDM women to be tested 6 weeks post-partum and once every 3 years PREDIABETES: should be tested yearly 	

ABBREVIATIONS

ALT: Alanine transaminase	CGM: Continuous glucose monitor	GDM: Gestational diabetes mellitus	OGTT: Oral glucose tolerance test
AST: Aspartate aminotransferase	CKD: Chronic kidney disease	HDL: High-density lipoprotein	SMBG: Self-monitoring of blood glucose
BMI: Body mass index	DTR: Deep tendon reflex	LDL: Low-density lipoprotein	TG: Triglyceride
BP: Blood pressure	ECG: Electrocardiogram	LFT: Liver function test	
CAD: Coronary artery disease	FPG: Fasting plasma glucose	OAD: Oral antidiabetic drug	

KEEP LOW THRESHOLD FOR DIAGNOSIS. MAKE SURE TO FOLLOW UP TO MEET TARGETS

This STW has been prepared by national experts of India with feasibility considerations for various levels of healthcare system in the country. These broad guidelines are advisory, and are based on expert opinions and available scientific evidence. There may be variations in the management of an individual patient based on his/her specific condition, as decided by the treating physician. There will be no indemnity for direct or indirect consequences. Kindly visit the website of DHR for more information: stw.icmr.org.in for more information. ©Department of Health Research, Ministry of Health & Family Welfare, Government of India.