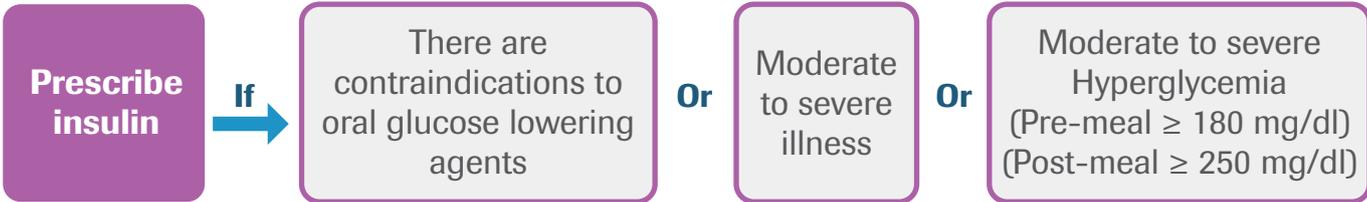


# Recommended guidance on the use of insulin therapy during these times by Ministry of Health & Family Welfare, Government of India.

3A	3B	3C
<p><b>To initiate insulin for patients newly detected with diabetes (At admission: Pre meal BG <math>\geq</math> 180 mg/dl or post-meal BG <math>\geq</math> 250 mg/dl)</b></p>	<p><b>If patient on OAD and uncontrolled BG levels (Pre-mean BG <math>\geq</math> 140 mg/dl or post meal BG <math>\geq</math> 180 mg/dl)</b></p>	<p><b>Patient is already on basal-bolus insulin regimen at admission</b></p>
<p>Total daily dose= 0.4 units/kg/day 0.2 units/kg/day if age <math>&gt;</math> 65 yrs, nephropathy or liver disease</p>	<p>Consult endocrinologist if pre-meal BG-140 to 180 mg/dl and/or post-meal-180 to 250 mg/dl for OAD optimization</p>	<p>Continue existing regimen. Monitor blood glucose levels and review with BG log to an endocrinologist/ physician.</p>
<p>Total daily dose is divided equally into 4 doses*</p>	<p>If pre-meal BG value <math>\geq</math> 180 mg/dl and/or post-meal BG value <math>\geq</math> 250 mg/dl despite on OAD: Start basal insulin</p>	
<p>Inject regular insulin 6 units SC 30 min before BF, 6 units SC 30 min BL and 6 units SC 30 min BD</p>	<p>If FPG is <math>\geq</math> 140mg/dl and post-meal increment in BG level is normal (<math>&lt;</math>40 mg/dl), then one can just add basal insulin (Inj. NPH insulin bedtime/ 2 hours after dinner)</p>	
<p>Inj. NPH insulin 6 units at bed time/2 hours AD</p>		



**Guidance on the use of insulin therapy**



**Basal bolus insulin regimen**

**Start with 0.4 units/kg/day**  
Consider lower dose 0.2 units/kg/day in elderly, frail or patients with renal/hepatic failure

**Prefer intravenous insulin infusion**

Uncontrolled hyperglycemia despite the use of basal-bolus insulin  
Critical illness like sepsis with or without shock  
Hyperglycemia with erratic diet status  
Hyperglycemic emergencies (DKA/HHS)  
Others (e.g. emergency surgery, labor)

**Deciding basal and bolus component**  
Divide equally into 4 doses when using regular and NPH insulin  
Divide equally into 2 doses when using insulin analogs

**Initiate** IV infusion at a dose of 0.05-0.1 unit/kg body weight  
**Titrate** infusion rate based on ambient BG level, magnitude of BG change in previous hour, factors influencing insulin sensitivity/resistance, time of the day, dietary status, concomitant medications and target BG level

**Blood glucose targets**  
Pre-meal:  $<$  140 mg/dl  
Post-meal:  $<$  180 mg/dl

**Target** BG between 140-220 mg/dl and **Monitor** glucose 1 to 2 hourly  
**Switch** to basal bolus when patient has consistent diet, stable doses, euglycemia, hemodynamic stability for at least 24 to 48 hours

**Glycemic Targets**

1. For most patients on basal-bolus insulin regimen (or for in-patient hyperglycemia management, in general), **pre-meal BG level of  $<$ 140 mg/dl** and **post-meal BG level of  $<$ 180 mg/dl** can be targeted.
2. In selected individuals, target levels of  **$<$ 120 mg/dl (pre-meal)** and  **$<$ 160 mg/dl (post-meal)** can be considered, provided these can be achieved without causing undue hypoglycemia.

Abbreviations: BBF: Before breakfast, BL: Before lunch, BDN: Before dinner, ADN: After dinner

**3D****To switch to basal-bolus insulin regimen from insulin infusion**

Consult endocrinologist/physician to switch to basal-bolus insulin regimen.

If there is an anticipated delay in consulting the endocrinologist/physician;

- Calculate the total daily dose (TDD) based on insulin infusion requirements for the last 24 hours: TDD=80% of the total daily insulin requirement on IV infusion in the last 24 hours.

Once you have the TDD, calculate the doses of bolus insulin and basal insulin regimen.

**3E****Patient is on Ryles Tube (RT) feeds**

Like standard meals, RT feeds should be divided into 3 major and 3 minor feeds. Major and minor feeds are defined by calories/quantity of feeds.

Timing of major feed: 9 am, 1.30pm, 7pm

Timing of minor feed: 11 am, 4.30 pm, 10 pm regimen.

Basal-bolus insulin regimen would be preferred in such patients.

Bolus insulin (Ing. Regular insulin) should be given 30 min before each major feed and basal insulin should be given at 10 pm.

Along with the last minor feed. CBG monitoring should be performed before and 2h after each major feed

**3F****Titration of insulin doses and glycemic targets**

Important point to remember-

Titrate proactively and not reactively. i.e. insulin doses are adjusted based on the previous day's BG log (taking into account action of bolus and basal insulin on the previous day) and not the current BG value

Basal dose is adjusted based on FPG. If FPG is  $\geq 140$  mg/dl, the basal dose (Inj. NPH insulin) administered at bed time should be increased (usually by 2 units, but may be higher) to target the FPG to  $< 140$  mg/dl on the next day.

Increment in the dose of basal insulin should be done after excluding nocturnal (especially 3 am) hypoglycemia.

**Guidance for deciding initial doses of insulin for steroid induced worsening of blood glucose in people with and without diabetes****No previous Diabetes**

**0.2 units/kg/day**  
NPH 0.1 unit/kg (Morning)  
Regular Insulin 0.1 unit/kg before lunch

**Already on 1 or 2 oral glucose lowering agents (oral-GLAs) for diabetes**

**0.4 units/kg/day**  
NPH 0.1 unit/kg (Morning/Evening)  
Regular Insulin 0.1 unit/kg BBF, BL, BD each

**Already on > 2 oral-GLAs for diabetes**

**0.6 units/kg/day**  
NPH 0.2 units/kg (Morning) + 0.1 unit/kg (Evening)  
Regular Insulin 0.1 unit/kg BBF, BL, BD each

**Diabetes on insulin > 0.6 units/kg/day**

**1.2 X patient's insulin dose units/kg/day (20% extra)**  
50%NPH [2/3rd (Morning) + 1/3rd(Evening)]  
50% Regular Insulin  
[divided between BBF, BL, BD each]

The dose of bolus insulin for each major meal (or major feed) is titrated such that pre-meal to post-meal BG increment remains around 30 to 50 mg/dl.

If postprandial excursion is above this range, check

- The insulin injection technique is correct
- There is an adequate time gap between the injection of prandial insulin and the meal (30 minutes for regular insulin) and
- Quality and quantity of carbohydrate in the meal is appropriate and relatively fixed.

If these factors do not contribute to the postprandial excursion or the excursion persists despite addressing these factors, the dose of prandial insulin (regular insulin) should be increased on a subsequent day.