

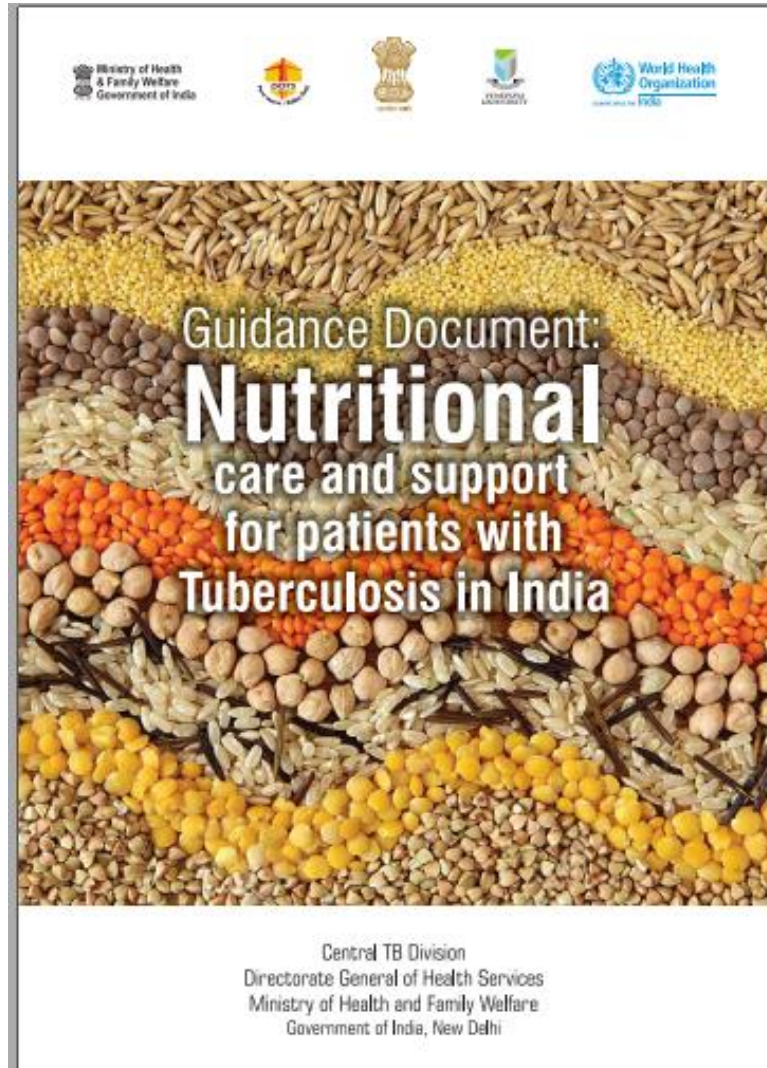
N-TB:

A mobile based application for nutritional assessment, counselling and nutritional care of adult patients with tuberculosis.

Developed by: Center for Nutrition Studies, Yenepoya(Deemed to be University), Mangalore.

In technical collaboration with:
Revised National TB Control Programme
World Health Organisation (India)
McGill International TB Centre

RNTCP Guidance document 2017



- Nutritional assessment, counselling, support in Indian context.
- Recommends hospitalisation of patients based on severity of undernutrition, vital signs and performance status.
- Contains a separate chapter on management of severely undernourished in hospital setting.



N-TB app



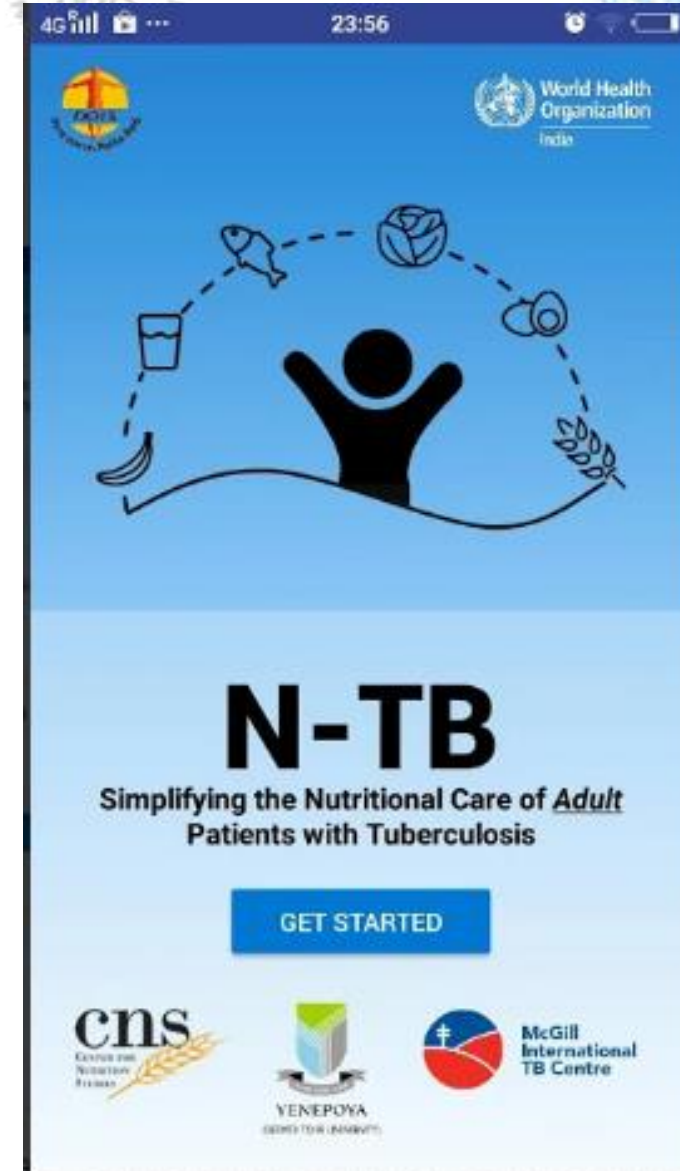
- Mobile based application freely downloadable from Google Play and Apple store.
- Simplifies assessment, counselling and support for undernourished adult patients with tuberculosis
- Weight and height are being recorded in TB treatment cards.
- Helps in simplifying the calculation of BMI (weight in kg/(height in metres)² and guides further actions based on nutritional status.

N-TB app helps in:

1. Assessment and classification of nutritional status based on BMI
2. Action based on the nutritional status
3. Indicates desirable weight and required weight gain depending on the current weight
4. It indicates recommended daily calorie and protein intake.
5. It provides tailored tips for dietary counselling for TB patients
6. Simple information on all food groups, their caloric and protein content
There is focus on locally available and cost-effective foods.

On the home screen

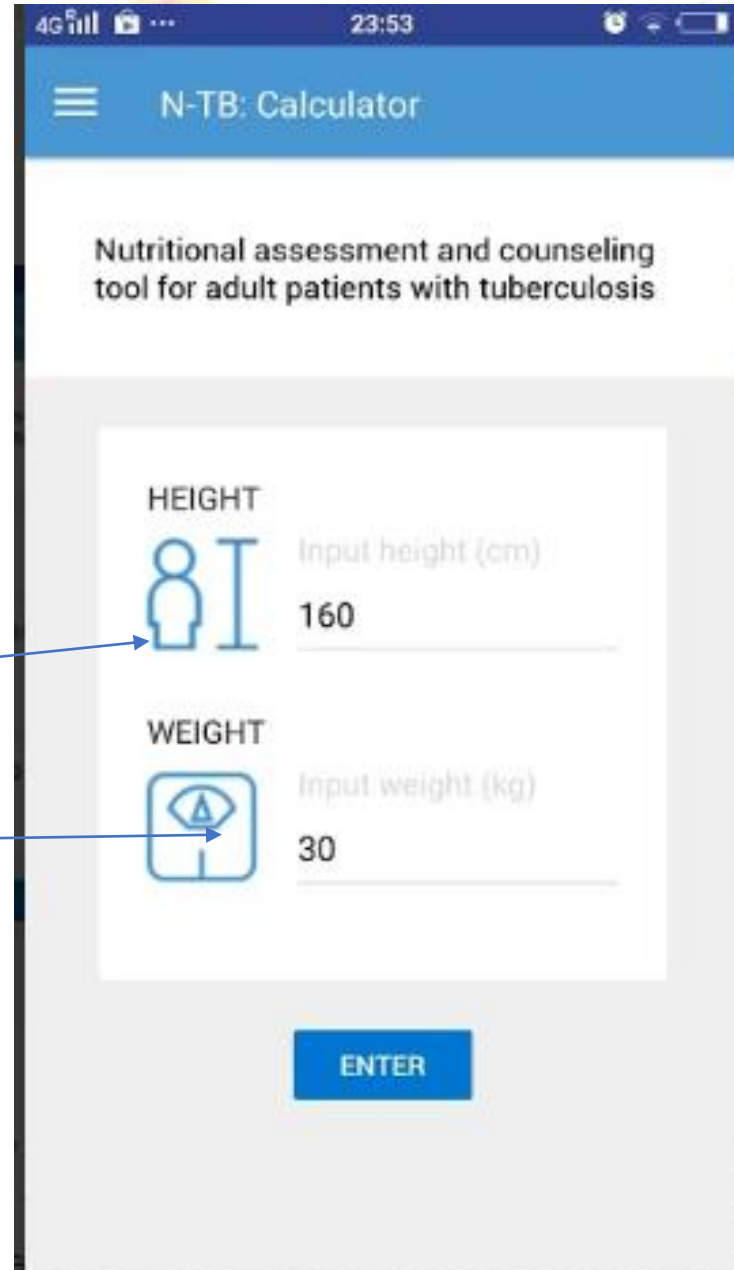
Press “Get started”



Calculator screen appears

- Enter height in cm and weight in kg
- For example in a patient:
 - Height is 160 cm
 - Weight is 30 kg,

Press “Enter”



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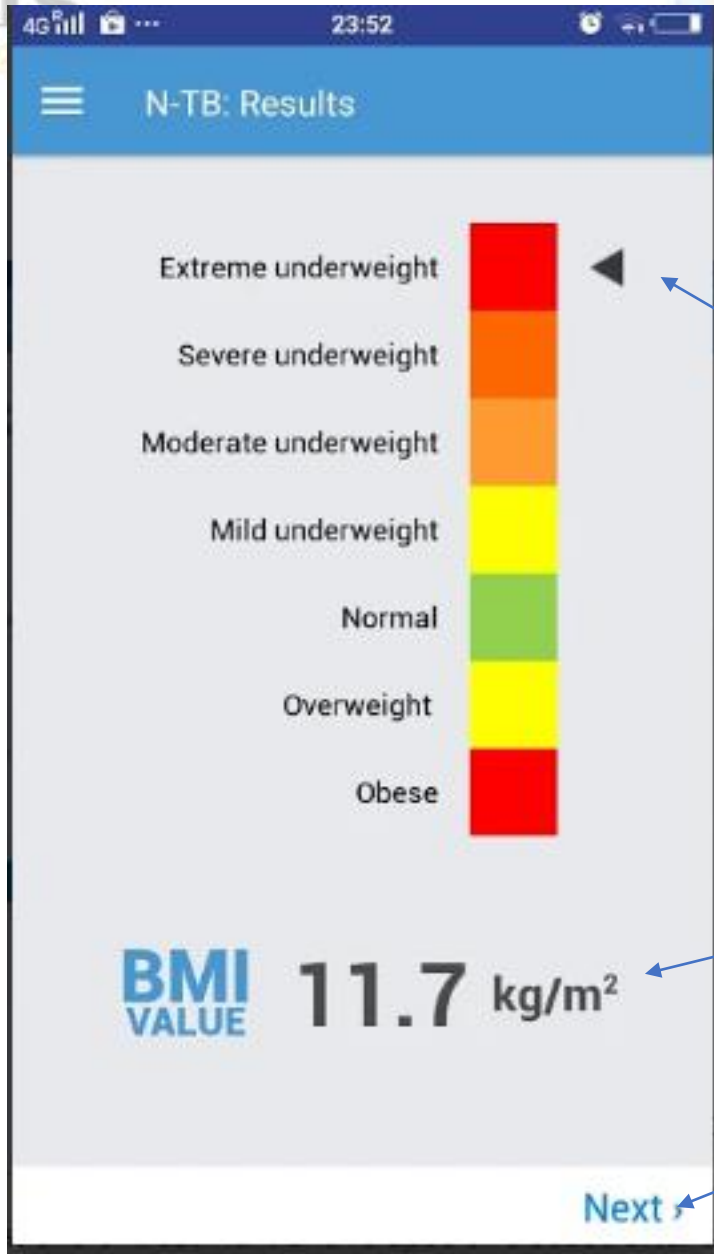
☰ N-TB: Calculator

Nutritional assessment and counseling tool for adult patients with tuberculosis

HEIGHT
Input height (cm)
160

WEIGHT
Input weight (kg)
30

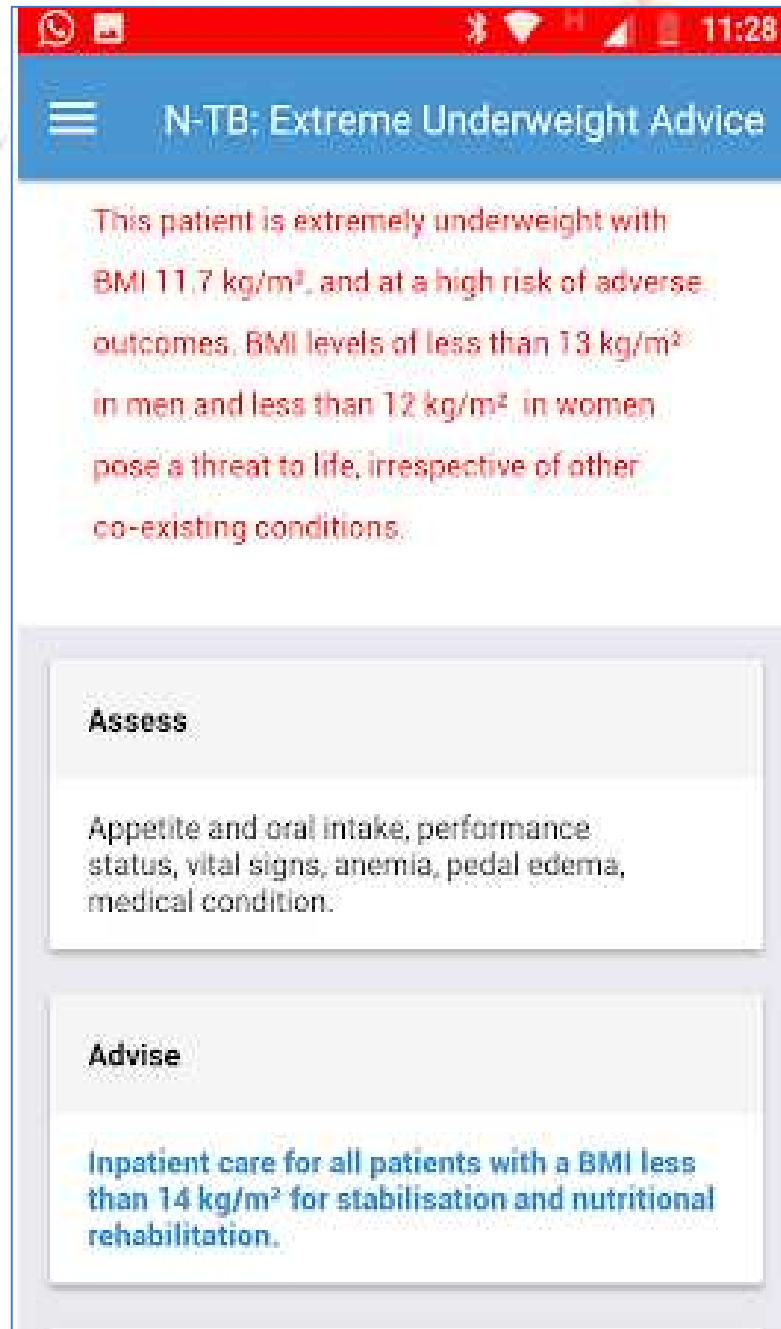
ENTER



- N-TB app classifies the BMI in colour coded manner
- In this example:
 - It is extreme underweight category
 - The app gives the BMI value which is very low
- Press “Next”

Action

- The next page indicates that the patient is extremely underweight
- Fulfils indications for admission
- The page also gives a summary of in-hospital management of severe undernutrition.
- Press “Next”



N-TB: Extreme Underweight Advice

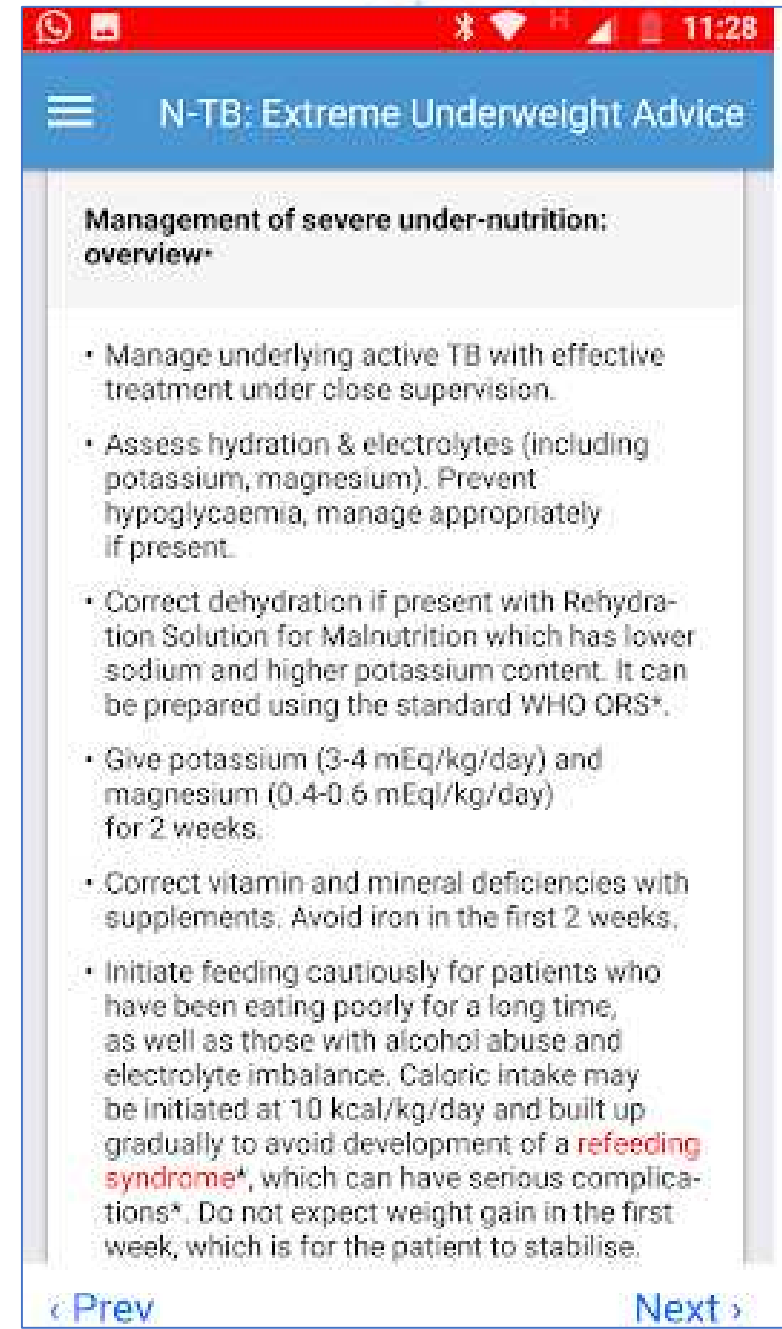
This patient is extremely underweight with BMI 11.7 kg/m², and at a high risk of adverse outcomes. BMI levels of less than 13 kg/m² in men and less than 12 kg/m² in women pose a threat to life, irrespective of other co-existing conditions.

Assess

Appetite and oral intake, performance status, vital signs, anemia, pedal edema, medical condition.

Advise

Inpatient care for all patients with a BMI less than 14 kg/m² for stabilisation and nutritional rehabilitation.



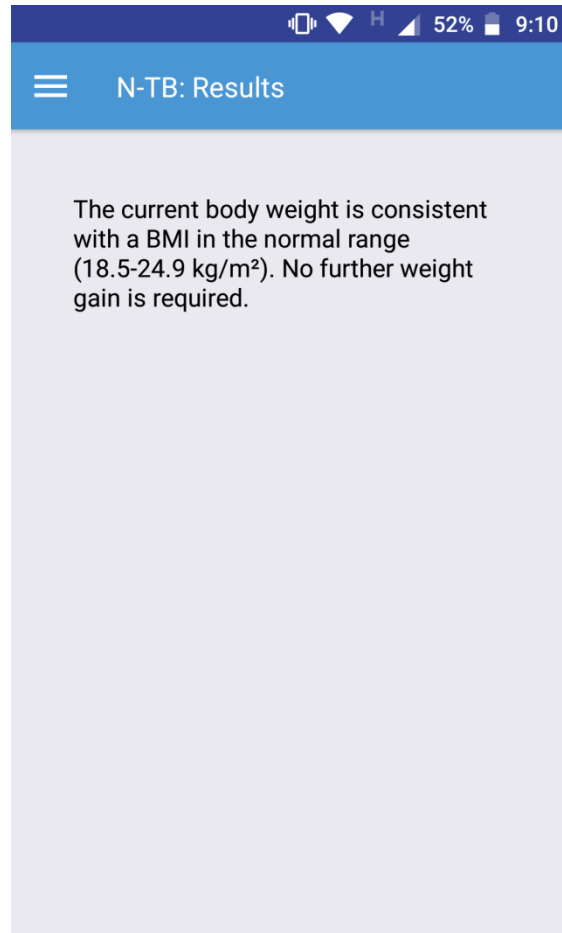
N-TB: Extreme Underweight Advice

Management of severe under-nutrition: overview*

- Manage underlying active TB with effective treatment under close supervision.
- Assess hydration & electrolytes (including potassium, magnesium). Prevent hypoglycaemia, manage appropriately if present.
- Correct dehydration if present with Rehydration Solution for Malnutrition which has lower sodium and higher potassium content. It can be prepared using the standard WHO ORS*.
- Give potassium (3-4 mEq/kg/day) and magnesium (0.4-0.6 mEq/kg/day) for 2 weeks.
- Correct vitamin and mineral deficiencies with supplements. Avoid iron in the first 2 weeks.
- Initiate feeding cautiously for patients who have been eating poorly for a long time, as well as those with alcohol abuse and electrolyte imbalance. Caloric intake may be initiated at 10 kcal/kg/day and built up gradually to avoid development of a **refeeding syndrome***, which can have serious complications*. Do not expect weight gain in the first week, which is for the patient to stabilise.

◀ Prev Next ▶

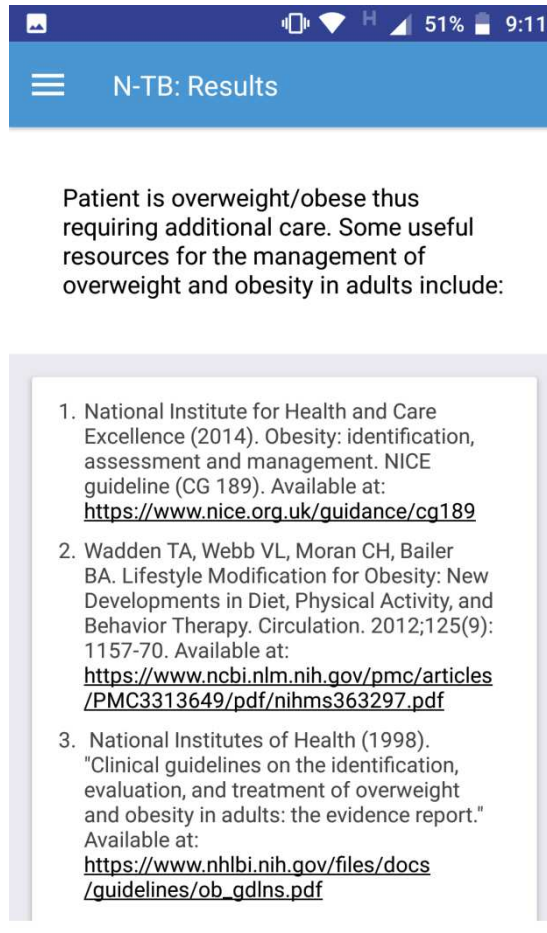
The app gives tailored messages depending upon BMI



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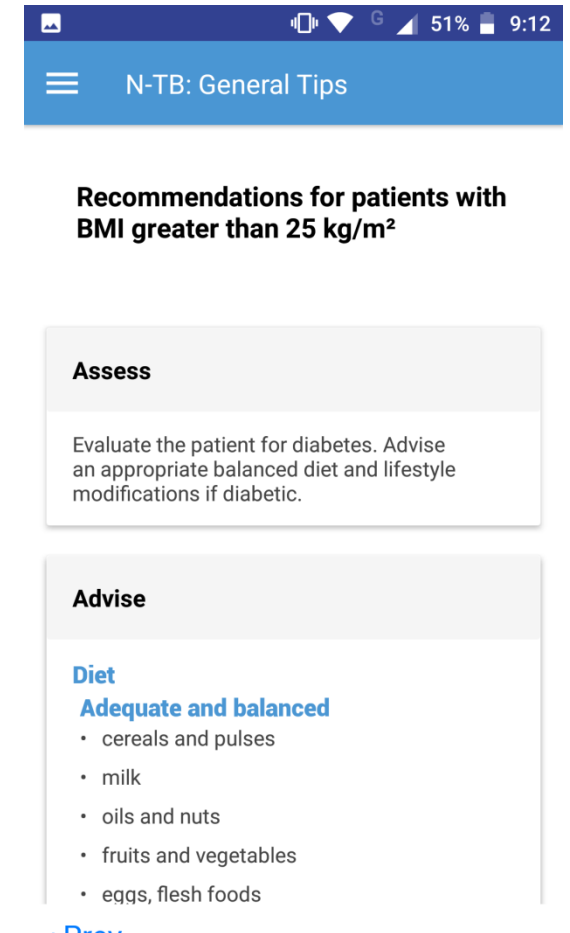
BMI in normal range



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BMI in overweight range. App also suggests evaluation for diabetes

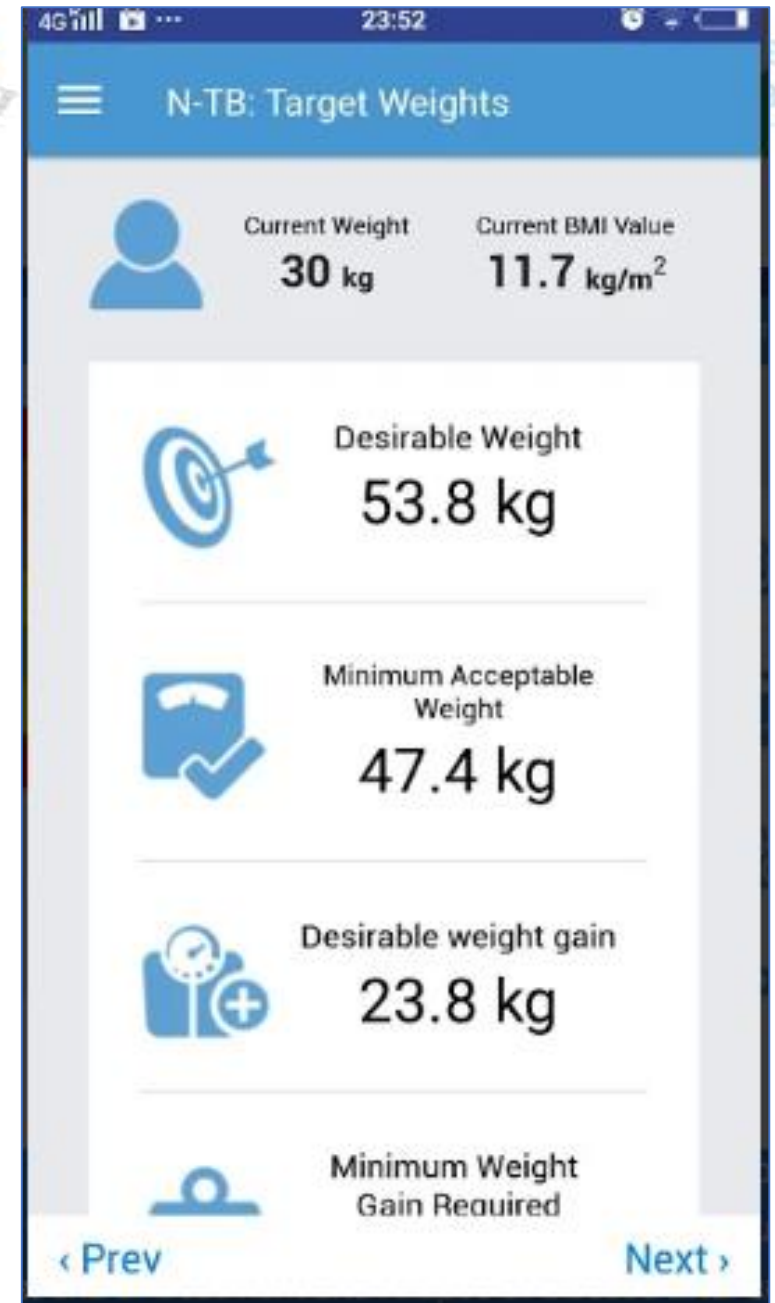


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Next screen gives current and Target weights and weight gain required

- Desirable weight = Weight required for BMI of 21 kg/m^2
- Minimum acceptable weight = Weight required for a BMI of 18.5 kg/m^2
- Desirable weight gain = Desirable weight – current weight
- Minimum weight gain recommended = Minimum acceptable weight – current weight

Scroll down screen for recommended daily caloric and protein intake



Recommended daily caloric and protein intake

- Recommended daily calorie intake for underweight.

(based on **40 kcal/kg** of desirable weight)

- Recommended daily protein intake for underweight.

(based on **1.2 -1.5 g/kg** of desirable weight)

- Press “Next”



Counselling tips

- On adequate balanced diet
- Number of meals and snacks
- Clarifying misconceptions about costly supplements and costly foods
- Advice on lifestyle.
- Advice on Monitoring
- Enter “**Done**”



N-TB: General Tips

Diet

Adequate and balanced

- cereals and pulses
- milk
- oils and nuts
- fruits and vegetables
- eggs, flesh foods

Cereals, oils and nuts are energy rich, while pulses, milk and dairy products, eggs and flesh foods are rich in proteins. Underweight patients need more of these foods.

Frequent feeds initially, when appetite is likely to be poor.

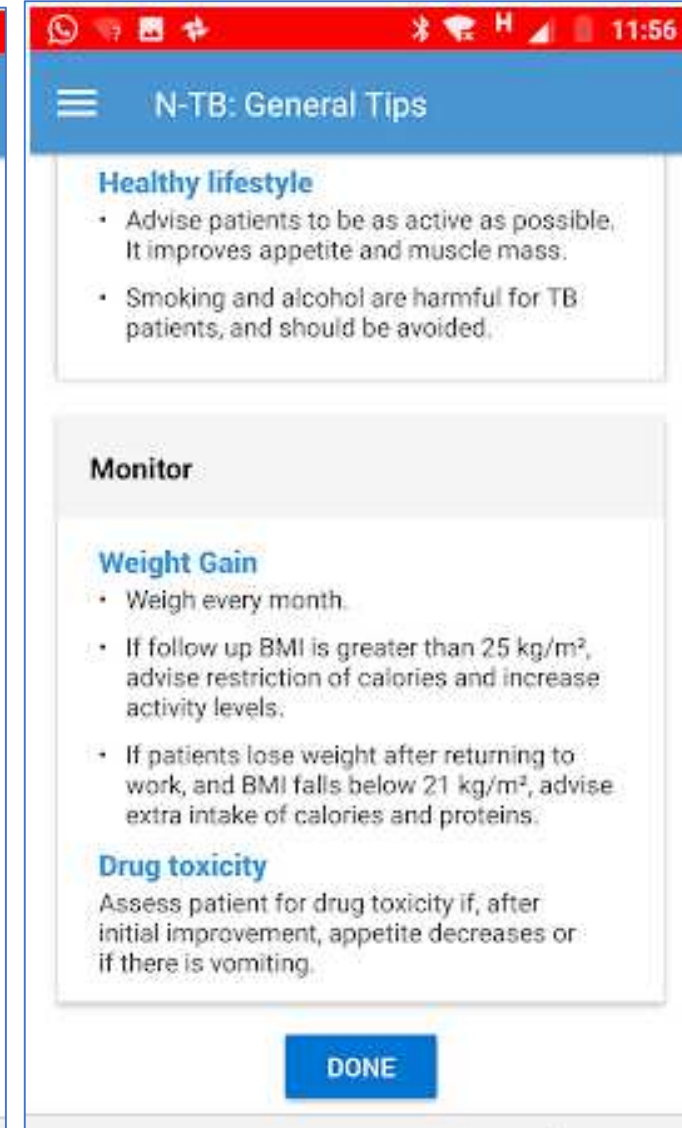
Later, when normal appetite returns, advise 3 meals and at least 2 snacks.

Supplements

- Costlier foods and nutritional supplements are not necessarily better than locally available foods.
- A multivitamin pill is adequate to meet micronutrient requirements if intake is very poor.

Healthy lifestyle

- Advise patients to be as active as possible. It improves appetite and muscle mass.



N-TB: General Tips

Healthy lifestyle

- Advise patients to be as active as possible. It improves appetite and muscle mass.
- Smoking and alcohol are harmful for TB patients, and should be avoided.

Monitor

Weight Gain

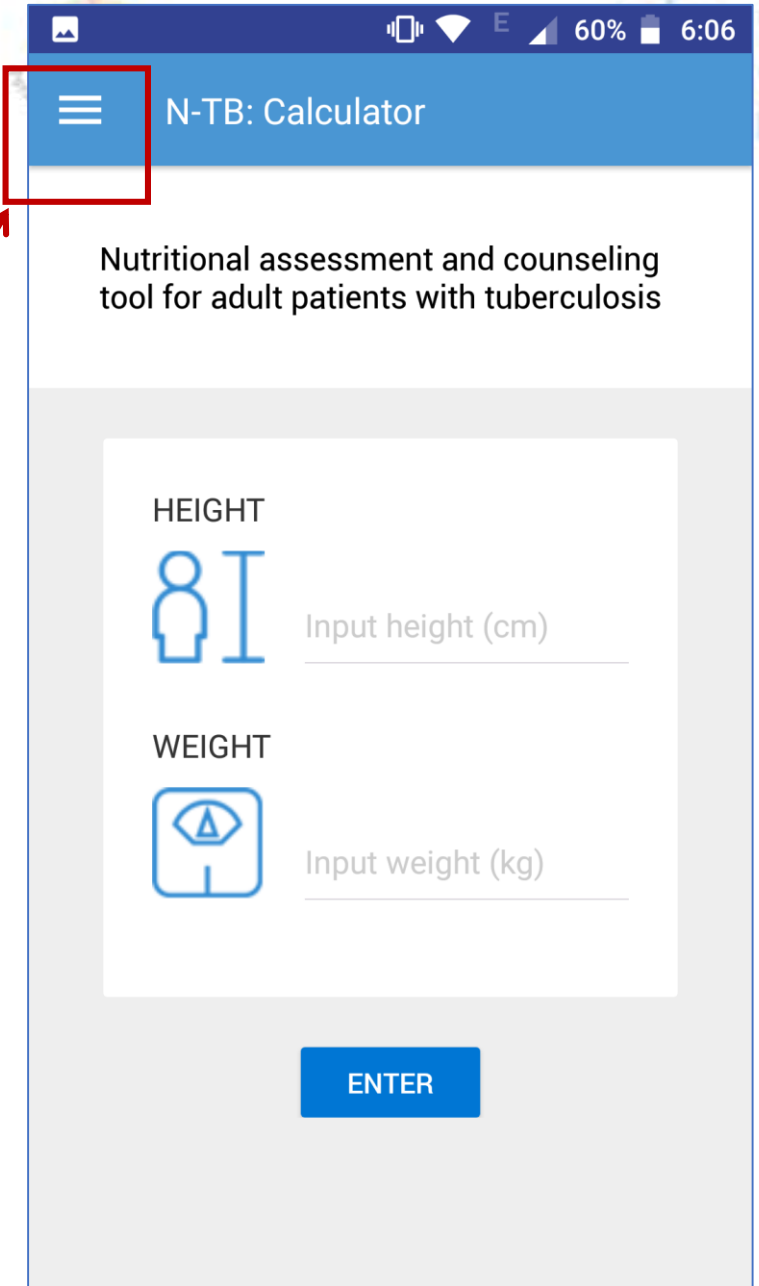
- Weigh every month.
- If follow up BMI is greater than 25 kg/m², advise restriction of calories and increase activity levels.
- If patients lose weight after returning to work, and BMI falls below 21 kg/m², advise extra intake of calories and proteins.

Drug toxicity

Assess patient for drug toxicity if, after initial improvement, appetite decreases or if there is vomiting.

DONE

- On pressing Done, the N-TB calculator screen re-appears
- Press on the Divisions to see a menu
- Gives information on:
 - Food groups
 - Classification of nutritional status according to BMI



N-TB: Calculator

Nutritional assessment and counseling tool for adult patients with tuberculosis

HEIGHT

Input height (cm)

WEIGHT

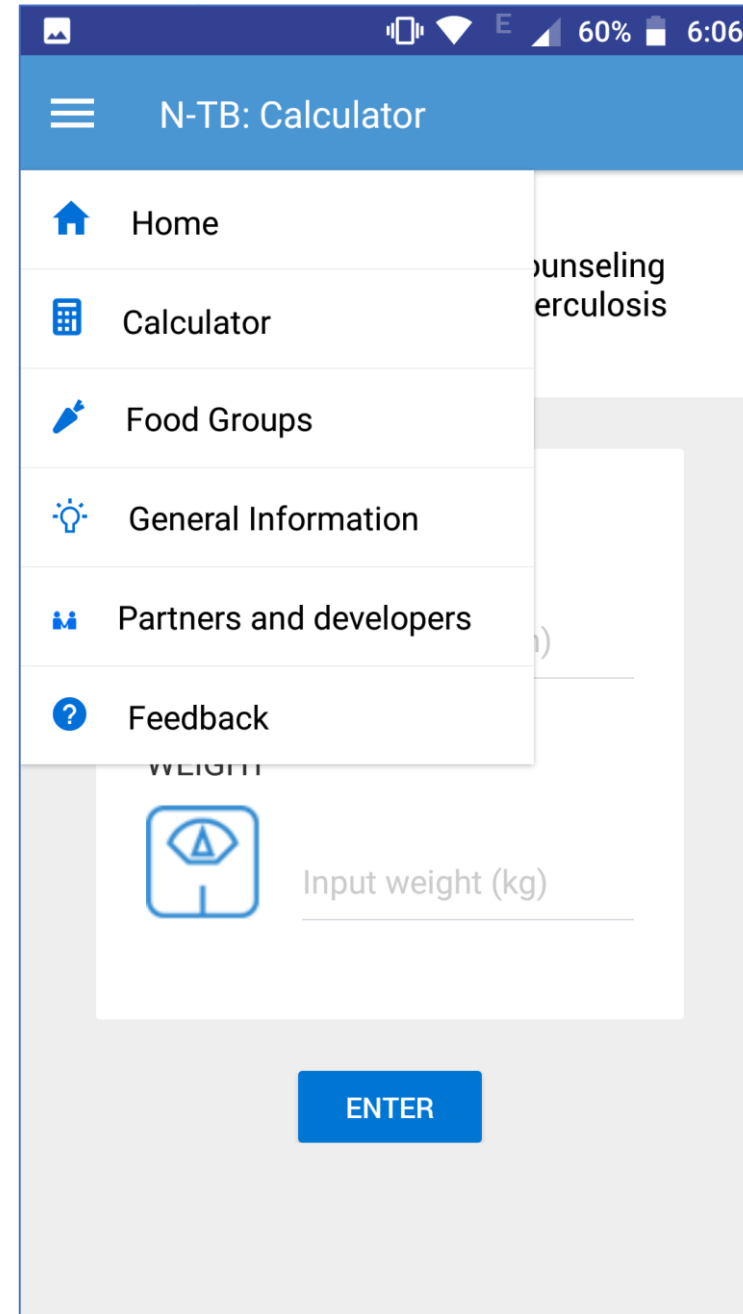
Input weight (kg)

ENTER

Menu

The menu mentions:

- Home
- Calculator
- Food groups: cereals, pulses, milk and dairy, non-vegetarian foods
- General information on classification of nutritional status



For meal plans, model diets, exchange lists of foods

- Please see pages 88-92 of the RNTCP Guidance document on Nutritional care and support of patients with tuberculosis in India.
- Links to the RNTCP document are provided in the counselling tips page, general information page of the app.



Thank you