

FREE EDITION · NOTES + 3 SAMPLE MCQS

CUET · HOME SCIENCE · CLASS XII · CODE 315

Clinical Nutrition and Dietetics

CUET unit: Unit II — Nutrition, Food Science and Technology

By UniDrill · NCERT-grounded study material

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Snapshot

- Defines Clinical Nutrition (a.k.a. Medical Nutrition Therapy) as the specialised area of nutrition that deals with nutrition during illness.
- Establishes the role, knowledge base and career scope of a dietitian / clinical nutritionist / medical nutrition therapist (MNT).
- Explains the nutritional care process, objectives of diet therapy and classification of diets (normal, modified; liquid, soft, mechanical soft; oral, tube, intravenous feeding).
- Links diet to prevention of chronic non-communicable diseases (obesity, diabetes, heart disease, hypertension).
- Lists academic qualifications and career avenues — a high-yield area for CUET factual MCQs.

Detailed Notes

2.1 Core concepts

- **Nutrition** is the science of food, nutrients and other substances as well as their digestion, absorption and utilisation by the body; it also covers social, psychological and economic aspects of food and eating (NCERT Introduction, p. 33).
- The specialised area of nutrition that deals with nutrition during illness is called **Clinical Nutrition**; in recent times this field is also called **Medical Nutrition Therapy** (NCERT Introduction, p. 33).
- Clinical nutrition focuses on the nutritional management of patients with established disease; the clinical nutritionist/dietitian uses a systematic and logical approach to the nutrition care process, addressing each patient's unique needs in an individualistic and holistic manner — the patient is the primary focus (NCERT §Significance, p. 33).
- Prevalence of non-communicable diseases — obesity, heart disease, hypertension, diabetes — is rising in India and occurring at younger ages; India is likely to be the diabetes "capital" of the world (NCERT §Significance, p. 33).
- Antioxidants such as beta-carotene, selenium, vitamin E and vitamin C, particularly from food, appear to have a protective role (NCERT §Significance, p. 34).

- Per FSSAI: **foods for special dietary uses / functional foods / nutraceuticals / health supplements** are foods specially processed or formulated to satisfy particular dietary requirements arising from a specific physical/physiological condition or disease (NCERT box, p. 34).
- **Medical foods** are specially manufactured for persons with specific needs and can be used only with a doctor's prescription for the specific dietary management of a disease or condition (NCERT box, p. 34).
- **Phytochemicals / Bioactive compounds** are non-nutrient constituents present in foods that have physiological or biological activity and influence health (NCERT box, p. 34).
- **Clinical Nutrition and Dietetics** concerns nutritional requirements of patients suffering from different diseases and prescribing the right type of diet for them (NCERT §Basic Concepts, p. 35).
- Objectives of **diet therapy** are: (i) promotion of recovery by formulating diet to meet patient's needs considering food habits, (ii) modification of existing diets to ameliorate and control the disease, (iii) correction of nutritional deficiencies, if any, (iv) prevention of short-term and long-term complications in chronic diseases, (v) education and counselling of the patient to adhere to the prescribed diet (NCERT §Basic Concepts, p. 35).
- **Nutritional care** during illness is an organised group of activities: assessing nutritional status, diagnosing nutritional problems, planning and prioritising nutrition interventions, and monitoring/evaluating outcomes (NCERT §Basic Concepts, p. 35).
- **Nutritional assessment** involves obtaining detailed information on health, diet, personal and medication histories; anthropometric measurements; relating laboratory and physical measurements with the physician's diagnosis; and interpreting all to identify potential nutritional deficiencies (NCERT box, p. 36).
- A **standard, normal or regular diet** includes all groups of foods and meets the needs of healthy individuals; in hospitals it would be low in fried fatty foods, sweets, spices and condiments (NCERT §Types of Diets, p. 37).
- **Modified diets** are adjusted to meet medical needs of a patient — may involve (1) change in consistency/texture (fluid/soft), (2) increase or decrease in energy, (3) more/less of specific nutrients (e.g., more protein in surgery, less in kidney failure), and (4) change in number of meals or special plan when route of feeding is altered (NCERT §Types of Diets, p. 37).
- **Liquid diets** are primarily fluid in consistency at room temperature; also called full fluid diets; free from fibre and nutritionally adequate; nutrients are easily absorbed if GI tract functions normally; advised for those unable to chew or swallow normally — e.g., coconut water, fruit juice, soup, milk, buttermilk, milk shakes (NCERT §Changes in Consistency, p. 37).

- **Clear liquid diet** is even thinner — e.g., clear soups, juices without pulp, very light tea — prescribed just after surgery; cannot fully meet nutritional requirements (NCERT p. 38).
- **Soft diets** provide semi-solid foods, lightly seasoned, low in fibrous/gas-forming foods; easy to chew and digest — e.g., **khichdi**, sago **kheer** (NCERT p. 38).
- **Mechanical soft diet** is a modification for the elderly with chewing problems — includes soft, mashed and pureed foods; differs from therapeutic soft diet which is given when rest to the digestive system is recommended (NCERT p. 38).
- **Feeding routes:** oral (mouth) is the most preferred; when not possible — (a) **tube feeding** (nutritionally complete feeds delivered through a tube introduced through nose into stomach), preferred over intravenous as long as GI tract is functional; (b) **intravenous feeding** — special solutions given through a drip in a vein (NCERT §Feeding Routes, p. 38).
- **Prevention of chronic diseases:** dietary changes in urban India — increased fat, increased refined sugar, reduced fibre/vitamins/minerals, increased animal protein — linked to obesity, colon cancer, diabetes, CVD and hypertension; high salt + high sodium processed foods + low potassium-rich fruits/vegetables/grains/legumes + low calcium + low activity + stress raise hypertension risk (NCERT pp. 38–39).
- **Preparing for a career:** requires 10+2 followed by B.Sc. in Home Science or B.Sc. with specialisation in Nutrition/Food Technology; to be a dietitian, at least a Postgraduate Diploma in Dietetics with an internship is required to qualify as a Registered Dietitian; M.Sc. in Food Science and Nutrition or Dietetics is preferred (NCERT §Preparing for a Career, p. 40).
- Teaching posts require clearing NET/SET conducted by UGC; Ph.D. advisable for academics/research (NCERT pp. 40–41).
- **Scope:** dietitian, diet counsellor, teacher, researcher, corporate consultant; opportunities in food industry, R&D, production of medical foods/nutraceuticals/ tube feeds/functional foods (NCERT §Scope, p. 41).

Conceptual expansions for CUET depth: Clinical Nutrition (Medical Nutrition Therapy, MNT) sits at the intersection of medicine, pharmacology and food science. The dietitian works as a member of the hospital's multi-disciplinary care team, alongside physicians, surgeons, nurses, physiotherapists and pharmacists. In Indian tertiary hospitals (AIIMS, PGIMER, CMC Vellore, Apollo, Fortis, Manipal), the clinical-nutrition department oversees both in-patient diet (regular and modified) and out-patient diet counselling for chronic non-communicable diseases (NCDs).

Note the dramatic rise of NCDs in India — obesity, type 2 diabetes, cardiovascular disease, hypertension — and the projection that India will become the diabetes capital of the world. The Indian Council of Medical Research–India Diabetes (ICMR-INDIAB) Study has documented that diabetes prevalence in urban India has crossed 11% and pre-diabetes another 15%. Antioxidants from food (beta-carotene, selenium, vitamins E

and C) matter more as part of dietary patterns (Mediterranean, DASH, plant-based) than as single nutrient supplements.

The Food Safety and Standards Authority of India (FSSAI) regulates nutraceuticals / functional foods / health supplements under the FSS Act 2006 and the 2016 Regulation on Nutraceuticals. The three regulatory categories — nutraceuticals, medical foods, phytochemicals — are demarcated by intended use and prescription status: nutraceuticals are foods specially processed for special dietary uses; medical foods are doctor-prescribed only; phytochemicals are bioactive non-nutrient constituents (e.g., polyphenols in tea, lycopene in tomato, curcumin in turmeric). CUET items routinely test these distinctions.

The diet-therapy workflow has five canonical objectives — promotion of recovery, modification of diets, correction of deficiencies, prevention of complications, education and counselling — and unfolds through the four-step nutritional care process: assess → diagnose → plan/prioritise intervention → monitor and evaluate. Nutritional assessment combines four sources of data — diet history, anthropometry (height, weight, MUAC, skinfolds, BMI), laboratory (haemoglobin, lipid profile, fasting glucose, electrolytes, renal/liver function), and clinical/physical examination signs (pallor, oedema, koilonychia, glossitis, Bitot's spots). The four-source ABCD framework (Anthropometry, Biochemistry, Clinical, Dietary) is the global standard.

Classification of hospital diets has two main axes. By consistency: normal/regular → soft → mechanical soft → full liquid → clear liquid (progressing thinner). By feeding route: oral (preferred) → nasogastric tube → percutaneous endoscopic gastrostomy (PEG) → jejunostomy → total parenteral nutrition (TPN) intravenous. The guidance that 'if the GI tract is functional, use it' (enteral over parenteral) is a global clinical standard, supported by reduced infection rates, lower cost, and preservation of gut mucosal integrity.

Modified diets serve specific disease conditions: high-protein in burns, trauma and post-surgery; low-protein in chronic kidney disease and hepatic encephalopathy; low-sodium in hypertension and heart failure; carbohydrate-controlled in diabetes; low-fat / lipid-modified in dyslipidaemia; gluten-free in coeliac disease; lactose-free in lactose intolerance; ketogenic in refractory epilepsy; high-fibre in constipation; low-fibre in diarrhoea and IBD flare.

The career pathway in India is precisely articulated: 10+2 with science → B.Sc. Home Science (or B.Sc. Nutrition/Food Technology) → PG Diploma in Dietetics with internship → registration with the Indian Dietetic Association (IDA) → 'Registered Dietitian'. M.Sc. in Food Science & Nutrition / Dietetics is preferred. Teaching posts require UGC-NET/SET; research requires Ph.D. Major employers include hospitals, diet clinics, food industry R&D, public-health departments, fitness studios, and corporate wellness providers.

2.2 Definitions to memorise

Term	Definition	Page
Nutrition	Science of food, nutrients and other substances and their digestion, absorption and utilisation by the body; also covers social, psychological and economic aspects of eating	33
Clinical Nutrition	Specialised area of nutrition that deals with nutrition during illness; in recent times called Medical Nutrition Therapy	33
Nutraceuticals / Functional foods (FSSAI)	Foods specially processed or formulated to satisfy particular dietary requirements due to a physical/physiological condition or disease	34
Medical foods	Specially manufactured for persons with specific needs; used only with a doctor's prescription for dietary management of a disease	34
Phytochemicals / Bioactive compounds	Non-nutrient constituents in foods with physiological/ biological activity that influence health	34
Diet therapy	Modification of normal diet to meet requirements of a patient for recovery, controlling disease, correcting deficiencies, preventing complications and educating the patient	35
Nutritional care	Organised activities — assessment, diagnosis, planning intervention, monitoring/evaluating outcomes	35
Normal/Regular diet	Diet including all food groups, meeting needs of healthy individuals; in hospitals low in fried, fatty, sweet, spicy foods	37
Modified diet	Diet adjusted in consistency, energy, specific nutrients, or feeding pattern to meet medical needs	37
Liquid (full fluid) diet	Primarily fluid at room temperature, free from fibre, nutritionally adequate — e.g., milk, soup, juice	37
Clear liquid diet	Even thinner liquids — clear soups, pulpless juices, light tea — prescribed just after surgery	38
Soft diet (therapeutic)	Semi-solid, lightly seasoned, low fibre, easy to chew and digest — e.g., khichdi, sago kheer	38
Mechanical soft diet	Soft, mashed, pureed foods for elderly with chewing difficulty	38
Tube feeding	Nutritionally complete feeds delivered through a tube via nose into stomach	38
Intravenous feeding	Special solutions delivered through a drip in a vein	38
Registered Dietitian	Credential earned by a dietitian after university education; regulated in many countries	40

2.3 Diagrams / processes to remember

- FSSAI definition box covering nutraceuticals / functional foods, medical foods and phytochemicals (p. 34).
- Five-point objectives of diet therapy list (p. 35).
- Four-step nutritional care process — assess → diagnose → plan/prioritise → monitor/evaluate (p. 35).
- Nutritional assessment box: history, anthropometry, laboratory + physical measurements, interpretation (p. 36).
- Career avenues box: dietitians with consultants/physicians, hospitals, freelance, catering services, entrepreneurs of speciality foods, teaching, research, nutrition marketing, technical writing (pp. 41–42).
- 24-hour dietary intake recording table (Practical, p. 44) and diet quality assessment table with recommended servings (p. 45).

2.5 Key data / clinical-nutrition processes table (Indian context)

Item	Value / fact	Source
Alternate name for clinical nutrition	Medical Nutrition Therapy (MNT)	NCERT p. 33
Nutritional assessment framework (ABCD)	Anthropometry; Biochemistry; Clinical; Dietary	NCERT p. 36
Number of diet-therapy objectives	Five	NCERT p. 35
Number of nutritional-care steps	Four (assess→diagnose→plan→monitor)	NCERT p. 35
Indian NCD trajectory	Diabetes capital of the world	NCERT p. 33
Antioxidants flagged	Beta-carotene; Selenium; Vit E; Vit C	NCERT p. 34
FSSAI nutraceuticals regulator	Food Safety and Standards Authority of India	NCERT p. 34
Medical food prescription	Required (doctor's prescription)	NCERT p. 34
Preferred feeding route	Oral	NCERT p. 38
Second-preferred feeding route	Tube (nasogastric)	NCERT p. 38
Last-resort feeding route	Intravenous	NCERT p. 38

Item	Value / fact	Source
Soft diet examples	Khichdi; sago kheer	NCERT p. 38
Liquid diet examples	Coconut water; fruit juice; soup; milk; buttermilk; milk shakes	NCERT p. 37
Clear liquid diet timing	Just after surgery	NCERT p. 38
Mechanical soft diet population	Elderly with chewing problems	NCERT p. 38
Minimum qualification for Registered Dietitian	PG Diploma in Dietetics with internship	NCERT p. 40
Preferred qualification	M.Sc. Food Science & Nutrition / Dietetics	NCERT p. 40
Indian professional body	Indian Dietetic Association (IDA)	India context
Indian diabetes prevalence (urban, ICMR-INDIAB)	~11% (with another ~15% pre-diabetes)	India context
Indian apex institute (research)	NIN, Hyderabad (ICMR)	India context

2.4 Common confusions / NTA trap points

- **Clinical Nutrition ≠ Dietetics in name only.** Clinical Nutrition's modern term is Medical Nutrition Therapy (MNT), not "Medical Nutrition Management". Distractor watch.
- **Tube feeding vs IV feeding.** Tube feeding goes through the nose into the stomach (GI tract used); IV feeding bypasses the GI tract. Tube feeding is preferred whenever the GI tract is functional.
- **Mechanical soft vs therapeutic soft diet.** Mechanical soft is for the elderly with chewing problems; therapeutic soft is to give rest to the digestive system.
- **Clear liquid diet** is given just after surgery and is **not** nutritionally adequate, while a full liquid diet is.
- **FSSAI definitions** of nutraceuticals, medical foods and phytochemicals are often mixed up — medical foods need a **doctor's prescription**; phytochemicals are **non-nutrient** constituents.
- **Qualification route:** Postgraduate Diploma in Dietetics with internship is the minimum to qualify as a **dietitian**; M.Sc. in Food Science and Nutrition/Dietetics is **preferred**, not mandatory.
- Dietitian prescribes **diet**, NOT drugs — the physician handles medication.

- Antioxidants are most beneficial from **food** (not necessarily from supplements) — a frequent distractor.
- Tube feeding is enteral (uses GI tract); IV is parenteral (bypasses GI). NTA may swap these terms.

Practice MCQs

PYQ Alignment

Clinical Nutrition and Dietetics is a high-yield CUET Home Science chapter — past CUET Home Science papers (2023–25) have consistently drawn factual recall (definitions of clinical nutrition, nutraceuticals, medical foods, phytochemicals), distinction-based questions (clear vs full liquid; mechanical vs therapeutic soft; tube vs IV feeding) and career-route questions (qualification, registered dietitian, career avenues). Expect roughly 8–10 MCQs of this style per cycle from this chapter.

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