



Reproductive Health Class 12 Notes

The Ultimate 12th NCERT Revision Guide for Class 12 Biology (2026–27 / New NCERT)

Full-colour diagrams, contraceptive comparison tables, NEET-ready summary

Chapter 3: Reproductive Health

Also see for this chapter: [NCERT Solutions](#) | [Formula Sheet](#) | [Exemplar Solutions](#)

How to use these notes

Chapter 3 is short and high-yield — almost every Board and NEET question lives in five buckets: **RCH programmes** → **contraception** → **MTP** → **STIs** → **infertility (ART)**. Memorise the classification trees (contraceptive categories, ART acronyms) cold; the prose is mostly definitions and reasons. Every NCERT figure is reproduced from the source book, with extra TikZ flow diagrams to fix the categories in memory. Revisit each **Quick Tip**, **Common Mistake** and **Memory Aid** box just before the exam — they cover the highest-yield NEET and CBSE traps.

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1 Reproductive Health: Concept and Scope

Reproductive health is a total well-being in all aspects of reproduction — **physical, emotional, behavioural** and **social** (WHO definition). A society is reproductively healthy if its people have:

- Physically and functionally normal **reproductive organs**.
- Normal emotional and behavioural interactions on all sex-related aspects.
- Access to information, counselling and medical care for reproduction-related problems.

India was the *first country in the world* to initiate action plans and programmes at a national level to attain total reproductive health as a social goal. The programmes called '**Family Planning**' were initiated in **1951** and have been periodically revised. The current umbrella programme is '**Reproductive and Child Health Care**' (**RCH**) programmes.

The four-corner definition (WHO)

Reproductive health = total well-being in *all four* aspects of reproduction:

1. **Physical** — normal reproductive organs and functions.
2. **Emotional** — mental and psychological well-being.
3. **Behavioural** — responsible sexual conduct.
4. **Social** — supportive social environment, awareness, no stigma.

Year: Family Planning programme launched in **1951**; renamed to RCH later.

Quick Tip

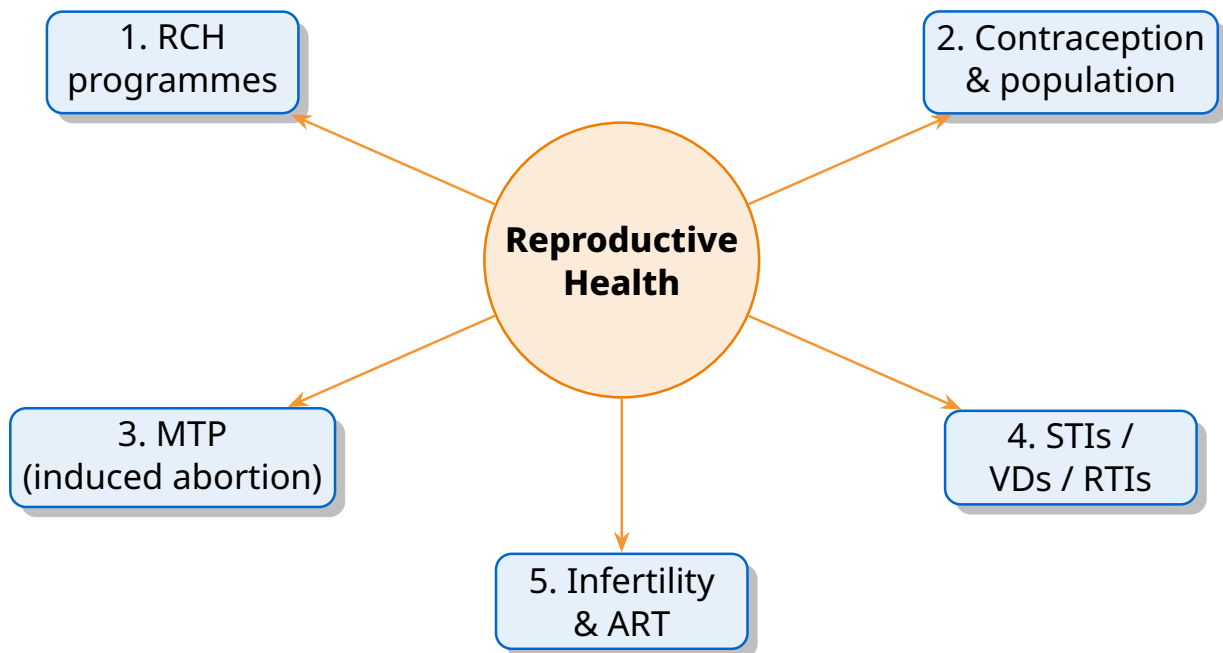
The single-line answer NEET examiners look for is: "Reproductive health is total well-being in **physical, emotional, behavioural and social** aspects of reproduction (WHO)." Drop a word and the mark goes too.

Four aspects of reproductive health

"**PEBS**" — **Physical, Emotional, Behavioural, Social**. Picture a healthy society as a stable table with four legs; remove any one and the table topples.

1.1 The Five-Topic Map of Chapter 3

Everything in this chapter slots into one of five buckets. Get the map straight before the details.



The five buckets, one sentence each

(1) Government tools to raise reproductive health (RCH, awareness, sex education). **(2)** Methods to control fertility (contraception) and the larger population issue. **(3)** Intentional ending of pregnancy and the laws around it. **(4)** Sexually transmitted infections and their prevention. **(5)** Inability to conceive and the assisted-reproduction technologies that help.

2 Problems, Strategies and the RCH Programme

2.1 The Reproductive and Child Health Care Programme

The RCH programme is the operational arm of India's reproductive health goal. Its two big tasks are:

1. **Creating awareness** among people about various reproduction-related aspects.
2. **Providing facilities and support** for building a reproductively healthy society.

Awareness is built through audio-visual and print media, by governmental and non-governmental agencies, and reinforced by parents, relatives, teachers and friends. Introduction of **sex education** in schools is encouraged so that young people get correct information about:

- Reproductive organs, adolescence and associated changes.
- Safe and hygienic sexual practices.
- Sexually transmitted diseases (STIs), AIDS, etc.

For couples in the marriageable age group, the programme provides information

on **birth control options**, **care of pregnant mothers**, **post-natal care** of mother and child, **importance of breast feeding**, and **equal opportunities** for the male and the female child.

2.2 Statutory and Research Support

Implementing the RCH programme needs strong infrastructural facilities, professional expertise and material support. Some of the statutory and research measures:

- **Statutory ban on amniocentesis for sex-determination** — to legally check the menace of **female foeticide**. Amniocentesis itself is a foetal-sex *and* foetal-disease test (it samples **amniotic fluid** to analyse fetal cells); the technique is permitted for diagnosing genetic disorders (Down syndrome, haemophilia, sickle-cell anaemia) and assessing foetal survival, but *not* for sex determination.
- **Massive child immunisation programmes.**
- **Research on new contraceptives and reproductive technologies.** A landmark example: '**Saheli**', a non-steroidal oral contraceptive pill for females, was developed at the **Central Drug Research Institute (CDRI), Lucknow**.

Amniocentesis — definition and ethical line

Amniocentesis: a procedure in which a sample of **amniotic fluid** surrounding the developing foetus is withdrawn to analyse **fetal cells** and dissolved substances.

Legitimate uses: detection of genetic disorders such as **Down syndrome, haemophilia, sickle-cell anaemia**; assessing foetal survival.

Banned use: sex determination of the foetus (often followed by illegal female foeticide).

Common Mistake

Students often write that "amniocentesis is banned" — this is wrong. The *procedure* is legal and clinically useful. What is banned is the **misuse of amniocentesis for sex determination**. Mark your answers accordingly.

2.3 Indicators of Improved Reproductive Health

NCERT explicitly lists the indicators that a society's reproductive health has improved. These are NEET favourites:

- Better awareness about sex-related matters.
- Increased number of medically assisted deliveries.
- Better post-natal care leading to decreased **maternal mortality rate (MMR)** and **infant mortality rate (IMR)**.
- Increased number of couples with **small families**.

- Better detection and cure of STIs.
- Overall increased medical facilities for all sex-related problems.

Quick Tip

For “Mention any four areas of improvement in reproductive health in India”-type questions, drop **lower MMR, lower IMR, smaller families, better STI cure**, increased medically assisted deliveries — pick any four from this list.

Solve the NCERT Exercises for Reproductive Health □

3 Population Stabilisation and Birth Control

3.1 Why Population Stabilisation is a Priority

In the last century, better health facilities and better living conditions had an **explosive impact on population growth**:

- **World population:** ~ 2 billion (1900) → ~ 6 billion (2000) → 7.2 billion (2011).
- **India:** ~ 350 million (1947) → close to 1 billion (2000) → 1.2 billion (May 2011).

The growth rate is driven by:

- Rapid decline in **death rate**.
- Rapid decline in **maternal mortality rate (MMR)** and **infant mortality rate (IMR)**.
- Increase in the number of people in the **reproducible age group**.

According to the **2011 census**, the population growth rate was less than **2% per year (i.e., 20/1000/year)** — a rate at which population can still increase rapidly. To restrain this, the government has used three levers:

1. Motivating smaller families through **contraceptive methods** (slogan *Hum Do Hamare Do*; many urban couples now adopt a *one-child norm*).
2. Statutorily raising the **marriageable age to 18 years for females and 21 years for males**.
3. **Incentives** for couples with small families.

Census-grade numbers you should know

World population: 2 billion (1900) → 6 billion (2000) → 7.2 billion (2011).

Indian population: 350 million (1947) → ~ 1 billion (2000) → 1.2 billion (2011).

2011 growth rate: < 2% per year (\equiv 20/1000/year).

Legal marriageable age: **18 years** (female), **21 years** (male).

Real-World Application

The *Hum Do Hamare Do* (“We two, our two”) slogan that ran on All-India Radio and DD National posters across the 1970s–1990s is not just a campaign jingle — it is the single most successful piece of policy-driven behaviour change in Indian public health. Combined with the marriageable-age law, it dragged India’s total fertility rate from roughly 6 children/woman in 1950 to roughly 2 in 2020.

3.2 What Makes an Ideal Contraceptive

An **ideal contraceptive** should be:

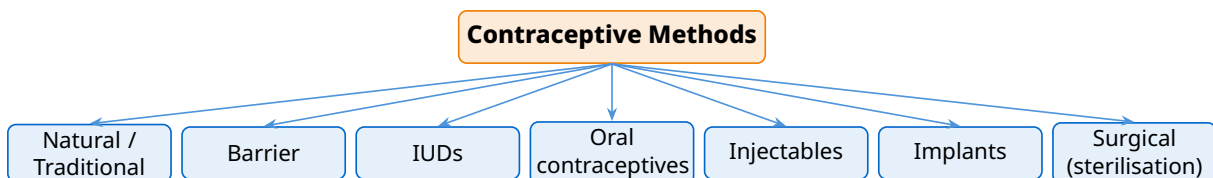
- **User-friendly** — easy to use.
- **Easily available.**
- **Effective** — prevents pregnancy reliably.
- **Reversible** — normal fertility returns once stopped.
- Has **no or least side effects.**
- **Does not interfere** with the sexual drive, desire, or sexual act.

The ideal-contraceptive checklist

“**U-E-E-R-N**” — **U**ser-friendly, **E**asily available, **E**ffective, **R**eversible, **N**o (or least) side effects. *Plus:* must not interfere with sexual drive/act.

3.3 Classification of Contraceptive Methods

NCERT divides contraceptives into **seven categories**. Learn the tree before the details.



Seven categories, one big idea each

Natural: avoid sperm–ovum meeting through timing. **Barrier:** a physical wall. **IUDs:** an object in the uterus that disrupts fertilisation or implantation. **Oral pills:** hormones that block ovulation. **Injectables/Implants:** same hormones, longer duration. **Surgical:** permanent block of gamete transport.

4 Natural and Barrier Methods

4.1 Natural / Traditional Methods

Natural methods work on the principle of **avoiding chances of ovum and sperm meeting**. No medicine, no device, no side effects — but **high failure rate**.

Three sub-methods:

- **Periodic abstinence** — couples avoid coitus from **day 10 to day 17** of the menstrual cycle (the *fertile period*, when ovulation is expected). Fertilisation chances are very high in this window.
- **Withdrawal / coitus interruptus** — the male partner withdraws his penis from the vagina just before ejaculation to avoid insemination.
- **Lactational amenorrhea** — absence of menstruation during **intense lactation after parturition**. Ovulation does not occur, so chances of conception are almost nil — but only effective up to a maximum of **six months** after delivery, and only while breastfeeding is fully maintained.

Three natural contraceptive methods

1. **Periodic abstinence** — abstain from coitus during **days 10–17** (fertile period).
 2. **Coitus interruptus (withdrawal)** — penis withdrawn before ejaculation.
 3. **Lactational amenorrhea** — relies on absent ovulation during full breastfeeding (max **6 months** post-partum).
- Common feature:** no medicines, no devices, almost no side effects. **Limitation:** high failure rate.

Quick Tip

NEET loves the exact window: **day 10 to day 17** of the menstrual cycle is the *fertile period* for periodic abstinence. NCERT prints this verbatim.

Common Mistake

Lactational amenorrhea is NOT a permanent method. It works only when the mother is **breastfeeding fully** and only for a **maximum of six months** after delivery. After that the cycle resumes and another contraceptive is needed.

4.2 Barrier Methods

Barrier methods physically prevent ovum and sperm from meeting. They exist for **both males and females**.

Condoms (Fig. 3.1 a, b) — barriers of thin **rubber/latex** sheath that cover the penis (male) or line the vagina and cervix (female) just before coitus. The ejaculated

semen does not enter the female reproductive tract.

- **Nirodh** is a popular brand of male condom in India.
- Both male and female condoms are **disposable, self-insertable** and give **privacy** to the user.
- Their use has risen sharply because they also protect against **STIs and AIDS** — a benefit no other contraceptive offers.



Figure 3.1(a) Condom for male

Source: NCERT Class 12 Biology, Chapter 3 — Fig. 3.1(a): Condom for male — a thin latex sheath that covers the penis and prevents semen from entering the female reproductive tract.

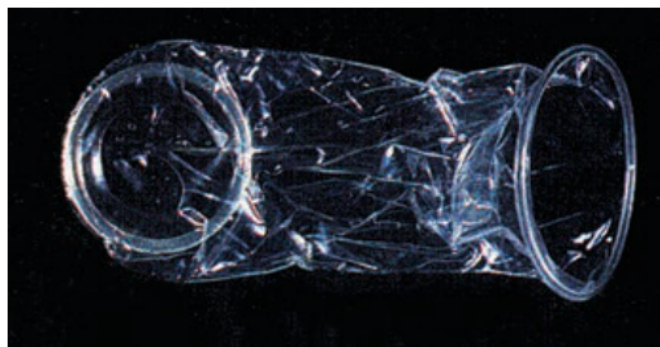


Figure 3.1(b) Condom for female

Source: NCERT Class 12 Biology, Chapter 3 — Fig. 3.1(b): Condom for female — a latex sheath inserted into the vagina to line the cervix; disposable and self-inserted.

Diaphragms, cervical caps, vaults — rubber barriers that are inserted into the female reproductive tract to **cover the cervix** during coitus, blocking the sperm from entering the uterus. Unlike condoms, these are **reusable**.

Spermicidal creams, jellies, foams — used along with the female barriers (diaphragms, caps, vaults) to **increase contraceptive efficiency**.

Barrier methods, one line each

Male condom: latex sheath on penis. Brand: Nirodh. Also protects against STIs/AIDS.

Female condom: latex sheath in vagina/cervix.

Diaphragms, cervical caps, vaults: rubber covers on the cervix; reusable; require spermicide.

Spermicides: creams/jellies/foams; *adjunct*, not stand-alone.

Real-World Application

Condoms are the only contraceptive that doubles as an STI/AIDS shield.

This dual role is the reason public-health campaigns for HIV prevention (e.g., India's NACO programme) push condoms over every other method, even where other contraceptives would be just as effective at preventing pregnancy.

5 IUDs, Hormonal Methods and Surgical Methods

5.1 Intra Uterine Devices (IUDs)

IUDs are devices inserted by doctors or expert nurses **into the uterus through the vagina**. They are one of the **most widely accepted contraceptive methods in India**.

Three sub-types (NCERT named):

- **Non-medicated IUDs** — e.g., **Lippes loop**.
- **Copper-releasing IUDs** — **CuT, Cu7, Multiload 375**.
- **Hormone-releasing IUDs** — **Progestasert, LNG-20**.

Mechanism — learn it group by group:

- All IUDs: increase **phagocytosis of sperms** within the uterus.
- Copper IUDs: release **Cu^{2+} ions** that **suppress sperm motility** and **reduce fertilising capacity**.
- Hormone IUDs: make the **uterus unsuitable** for implantation and the **cervix hostile** to sperms.

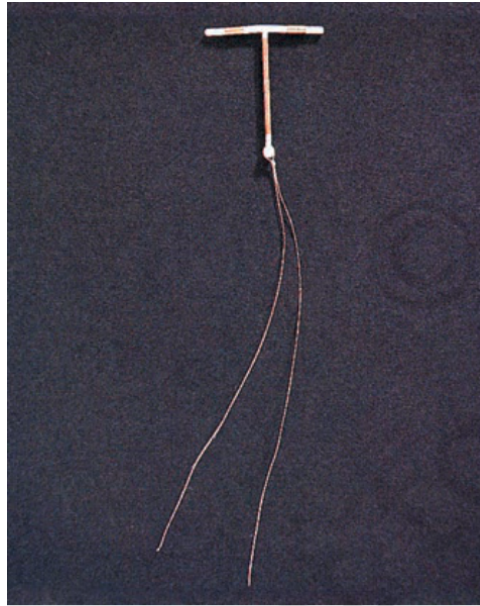


Figure 3.2. Copper T (CuT)

Source: NCERT Class 12 Biology, Chapter 3 — Fig. 3.2: Copper T (CuT) — a copper-releasing IUD inserted into the uterus.

Best suited for: females who want to **delay pregnancy** and/or **space children**.

IUDs at a glance

Inserted: into the uterus, through the vagina, by a doctor or trained nurse.

Types:

- Non-medicated — Lippes loop.
- Copper-releasing — CuT, Cu7, Multiload 375.
- Hormone-releasing — Progestasert, LNG-20.

Action (all): ↑ phagocytosis of sperm.

Action (copper): Cu^{2+} suppresses sperm motility & fertilising capacity.

Action (hormone): uterus unsuitable for implantation, cervix hostile to sperm.

Best use: delay/space pregnancies.

Three IUD families

“NCH IUDs” — **N**on-medicated (Lippes), **C**opper (CuT, Cu7, Multiload-375), **H**ormone (Progestasert, LNG-20). Each family adds one extra trick on top of phagocytosis: copper kills sperm motility, hormones spoil the uterine bed.

5.2 Oral Contraceptive Pills

Oral contraceptives (OCs) contain **small doses of progestogens** or **progestogen + estrogen combinations** taken as tablets — popularly called ‘pills’.

Dosage schedule:

- Take **daily for 21 days**, preferably starting within the **first 5 days** of the menstrual cycle.
- Followed by a **7-day gap** (during which menstruation occurs).
- Repeat the cycle until pregnancy is desired.

Triple mode of action:

1. **Inhibit ovulation.**
2. **Inhibit implantation.**
3. **Alter the quality of cervical mucus** to prevent or retard entry of sperms.

Saheli — a non-steroidal oral contraceptive developed at **CDRI, Lucknow**. It is a '**once-a-week**' pill with very few side effects and high contraceptive value.

Oral contraceptive pills — the 21+7 protocol

Contents: progestogens or progestogen-estrogen combinations.

Schedule: 21 days on (start within day 1–5 of cycle) → 7 days off (menses) → repeat.

Modes of action:

1. Inhibit ovulation.
2. Inhibit implantation.
3. Alter cervical mucus to retard sperms.

Saheli: non-steroidal, *once-a-week* female pill from **CDRI, Lucknow**.

Quick Tip

"Mode of action of oral pills" is a recurring NEET MCQ. The three-pronged answer — **inhibit ovulation, inhibit implantation, alter cervical mucus** — is in the NCERT line verbatim. Don't drop one.

5.3 Injectables, Implants and Emergency Contraception

The same hormones used in pills (**progestogens alone, or progestogens + estrogens**) can also be administered as **injections** or **implants under the skin**. Their mode of action is similar to that of pills, but their **effective periods are much longer**.

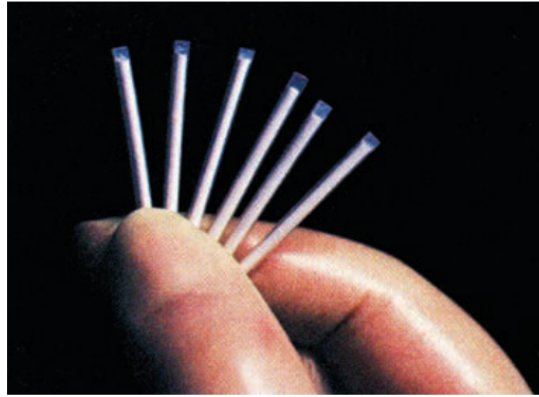


Figure 3.3 Implants

Source: NCERT Class 12 Biology, Chapter 3 — Fig. 3.3: Implants — small hormone-releasing rods inserted under the skin that provide long-duration contraception.

Emergency contraception:

- Administration of **progestogens (alone or with estrogens)** OR **IUDs** within **72 hours of coitus**.
- Highly effective against pregnancy due to **rape** or **casual unprotected intercourse**.

Emergency contraception — the 72-hour window

Options: hormonal pills (progestogens \pm estrogens) or IUD insertion.

Time window: within **72 hours** of coitus.

Indications: rape, casual unprotected intercourse, contraceptive failure.

Common Mistake

“Emergency contraception” is **not** a regular method. The 72-hour rule applies only to a single act — not to ongoing use. Treating it as a substitute for daily contraception is one of the commonest exam-question traps and a common public-health misconception.

5.4 Surgical Methods (Sterilisation)

Surgical methods, also called **sterilisation**, are *terminal* contraceptive methods for the male or female partner. They **block gamete transport**, so conception cannot occur.

Vasectomy (in the male):

- A small part of the **vas deferens** is removed or tied up.
- Done through a small incision on the **scrotum**.

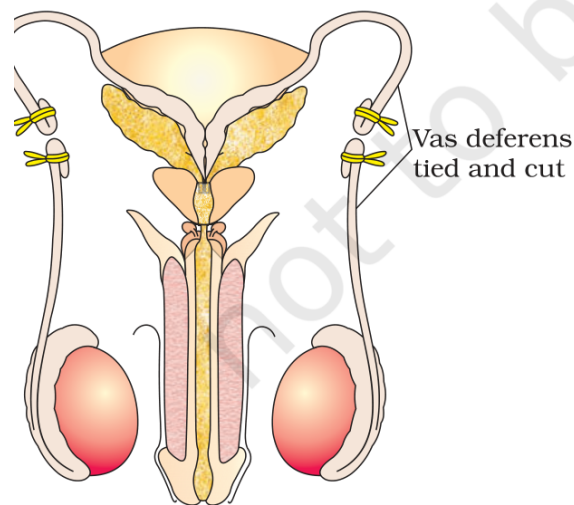


Figure 3.4 (a) Vasectomy

Source: NCERT Class 12 Biology, Chapter 3 — Fig. 3.4(a): Vasectomy — a small portion of the vas deferens is tied and cut to block sperm transport.

Tubectomy (in the female):

- A small part of the **fallopian tube** is removed or tied up.
- Done through a small incision in the **abdomen** or through the **vagina**.

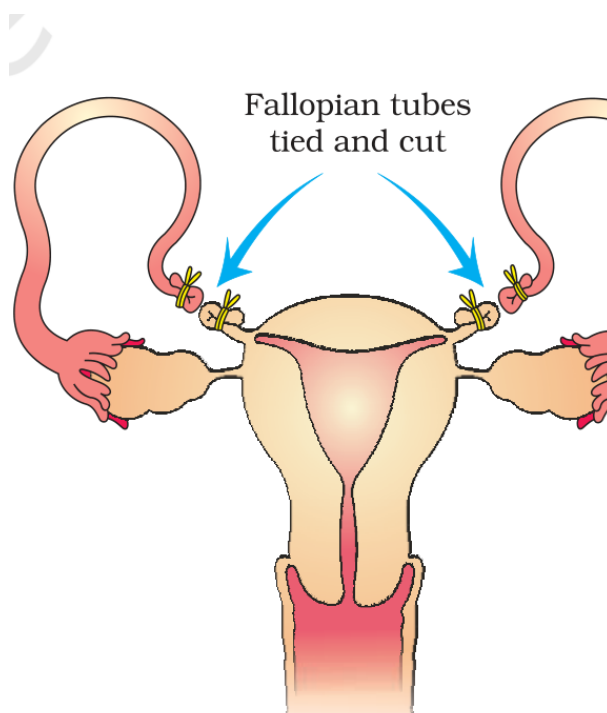


Figure 3.4 (b) Tubectomy

Source: NCERT Class 12 Biology, Chapter 3 — Fig. 3.4(b): Tubectomy — a small portion of each fallopian tube is tied and cut to block ovum transport.

Key fact: these techniques are **highly effective**, but their **reversibility is very**

poor. Sterilisation is therefore reserved for couples who are sure they do not want more children.

Vasectomy vs Tubectomy

Vasectomy — in male; cuts the **vas deferens**; incision on scrotum; blocks sperm transport.

Tubectomy — in female; cuts the **fallopian tube**; incision on abdomen or via vagina; blocks ovum transport.

Both: highly effective; *poor reversibility*.

5.5 Comparison Table: All Seven Methods

Category	Examples	Mode of action	Reversible?
Natural	Periodic abstinence, withdrawal, lactational amenorrhea	Avoid ovum-sperm meeting (timing)	Yes
Barrier	Condoms (male/female), diaphragm, cervical cap, vault, spermicides	Physical block; condoms also block STIs	Yes
IUDs	Lippes loop, CuT, Cu7, Multiload 375, Progestasert, LNG-20	↑ phagocytosis of sperms; Cu^{2+} kills motility; hormones spoil uterus & cervix	Yes
Oral pills	Progestogen / progestogen+estrogen tablets; Saheli	Inhibit ovulation, inhibit implantation, alter cervical mucus	Yes
Injectables	Progestogen / progestogen+estrogen injections	Same as pills, longer duration	Yes
Implants	Subdermal hormone rods	Same as pills, very long duration	Yes
Surgical	Vasectomy, tubectomy	Block gamete transport (sperm or ovum)	Poor (terminal)

5.6 Why Contraceptives Are Not Routine Health Items

NCERT stresses an important nuance: *contraceptives are not regular requirements for the maintenance of reproductive health*. They are practised **against a natural reproductive event** — conception or pregnancy. One uses them to:

- Prevent pregnancy.
- Delay pregnancy.
- Space children.

The decision must be taken with a **qualified medical professional**. Possible **side effects** — though usually not very significant — include:

- Nausea, abdominal pain.
- Breakthrough bleeding, irregular menstrual bleeding.
- In rare cases, breast cancer (long-term hormone exposure).

The honest framing of contraception

Contraceptives *prevent* a natural event. They are tools, not routine health supplements. The decision is medical, the side effects are real (though small), and the goal is family planning — not a permanent fix to be applied without thought.

[Get the Class 12 Biology Formula Sheet](#) □

6 Medical Termination of Pregnancy (MTP)

6.1 Definition, Scale and Indian Law

Medical Termination of Pregnancy (MTP) = intentional or voluntary termination of pregnancy before full term. It is also called **induced abortion**.

Scale: nearly **45–50 million MTPs** are performed every year worldwide — about **one-fifth** of all conceived pregnancies in a year.

India's law:

- The **Medical Termination of Pregnancy Act** was passed in **1971**.
- Goal: reduce illegal abortions and resulting maternal mortality/morbidity.
- The **2017 Amendment** further refined the conditions: a pregnancy can be terminated within the first **12 weeks** on the opinion of **one** registered medical practitioner; between **12 and 24 weeks**, two registered medical practitioners must agree, in good faith, that the legal grounds apply.

Grounds for legal MTP (NCERT-stated):

1. Continuation of pregnancy would involve a **risk to the life or grave injury to the physical/mental health of the pregnant woman**.
2. Substantial risk that, if born, the **child would suffer from serious physical or mental abnormalities**.

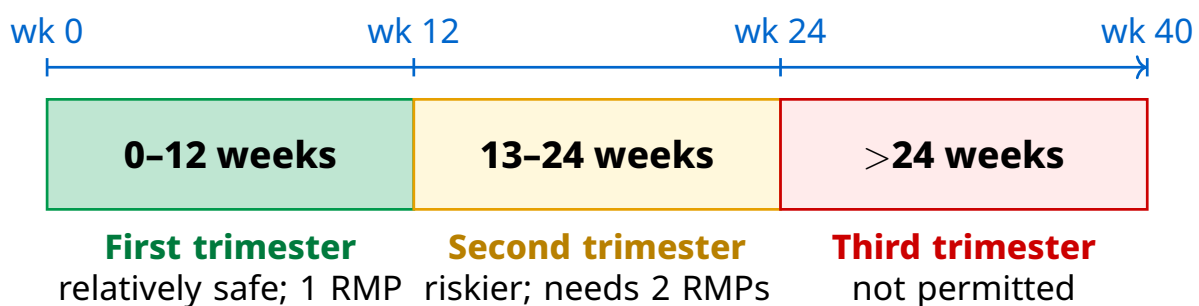
6.2 Why MTPs Are Needed

NCERT lists three legitimate reasons:

- **Unwanted pregnancies** due to casual unprotected intercourse or failure of contraceptives.
- **Pregnancies from rape.**
- Cases where **continuation of pregnancy would be harmful or fatal** to the mother, the foetus or both.

6.3 Timing: First Trimester vs Second Trimester

Critical exam fact: MTPs are considered **relatively safe in the first trimester** — up to **12 weeks** of pregnancy. **Second-trimester abortions are much riskier.**



6.4 The Abuse of Amniocentesis and Female Foeticide

A dangerous and illegal trend: amniocentesis is misused to determine **the sex of the foetus**; if female, an MTP is then performed. This is **against the law** and is one of the strongest drivers of India's skewed child sex ratio in some states.

Add to that the fact that many MTPs in India are performed **illegally by unqualified quacks** — not just unsafe, but often **fatal**. Public-health response: stronger counselling, more legal facilities, awareness about the risks of illegal abortions, and the amniocentesis-for-sex-determination ban.

MTP — the numbers to memorise

Year legalised in India: 1971.

Worldwide scale: 45–50 million MTPs/year ($\approx 1/5$ of all pregnancies).

Safer window: first trimester (up to 12 weeks).

Riskier window: second trimester (12–24 weeks).

Banned misuse: amniocentesis for sex determination → female foeticide.

Common Mistake

Don't confuse abortion with miscarriage.

- **Abortion (MTP, induced):** intentional, by medical procedure.
- **Spontaneous abortion (miscarriage):** unintentional, natural loss of pregnancy.

Both can happen, but MTP refers specifically to the *intentional, induced* case.

Real-World Application

The **PCPNDT Act, 1994** (Pre-Conception and Pre-Natal Diagnostic Techniques Act) is the legal teeth behind India's ban on prenatal sex-determination. Clinics that perform ultrasound or amniocentesis are required to declare in writing that they will not disclose the sex of the foetus. Stings against violators carry imprisonment and licence cancellation — a direct policy response to female foeticide.

7 Sexually Transmitted Infections (STIs)

7.1 Definition and the Big List

Infections or diseases transmitted through **sexual intercourse** are collectively called **Sexually Transmitted Infections (STIs)** — also called **venereal diseases (VDs)** or **reproductive tract infections (RTIs)**.

NCERT's complete list of STIs:

- Gonorrhoea, syphilis.
- Genital herpes.
- Chlamydia.
- Genital warts.
- Trichomoniasis.
- Hepatitis-B.
- HIV → leading to **AIDS** — the most dangerous (discussed in detail in Chapter 7).

Non-sexual routes for some STIs: Hepatitis-B and HIV can also be transmitted via:

- Sharing infected **injection needles**.
- Shared **surgical instruments**.
- **Blood transfusion** (infected donor).
- **Infected mother** → **foetus** (vertical/transplacental).

7.2 Curable vs Incurable STIs

Memorise this split — NCERT bullets it.

Curable if detected early	NOT completely curable (manageable only)
Gonorrhoea, syphilis	Hepatitis-B
Chlamydia, trichomoniasis	Genital herpes
Genital warts	HIV / AIDS

Three incurable STIs

“HHH” — **H**epatitis-B, **H**erpes, **H**IV/AIDS. Everything else on the NCERT list is curable if caught early.

7.3 Symptoms, Stigma and Complications

Early symptoms (most STIs):

- Itching.
- Fluid discharge.
- Slight pain.
- Swellings in the genital region.

Detection challenge: infected **females are often asymptomatic** in early stages — so the infection remains undetected. **Social stigma** discourages timely visits to a doctor.

Late complications if untreated:

- **Pelvic inflammatory diseases (PID).**
- **Abortions.**
- **Still births.**
- **Ectopic pregnancies.**
- **Infertility.**
- **Cancer of the reproductive tract.**

7.4 High-Risk Group and the Three-Point Prevention Code

Highest-incidence age group: 15–24 years — the very group most students belong to.

NCERT’s three principles for prevention:

1. **Avoid sex with unknown or multiple partners.**
2. Always try to use **condoms** during coitus.
3. In case of doubt, **visit a qualified doctor early** for detection and complete treatment.

STI prevention — the three rules

1. Avoid sex with unknown/multiple partners.
2. Use condoms during coitus.
3. If in doubt, see a qualified doctor early for diagnosis and complete treatment.

Bonus screen: routine screening of blood donors and use of disposable syringes prevent the non-sexual routes (Hep-B, HIV).

Quick Tip

Two facts NEET squeezes into one question: **(a)** the high-risk age group for STIs is **15–24 years**; **(b)** the three incurable STIs are **hepatitis-B, genital herpes, HIV/AIDS**. Both come from this section verbatim.

8 Infertility and Assisted Reproduction (ART)

8.1 What Infertility Means

Infertility = inability of a couple to produce children **despite unprotected sexual co-habitation**. (Clinically, this is usually after 2 years of trying.)

Possible causes: many — **physical, congenital, diseases, drugs, immunological, psychological**.

Important social point made in NCERT: in India the **female is often blamed** for the couple being childless, but in reality the **problem often lies in the male partner**. Diagnosis at **specialised infertility clinics** can identify and correct many such disorders.

8.2 The ART Toolkit — Memorise Every Acronym

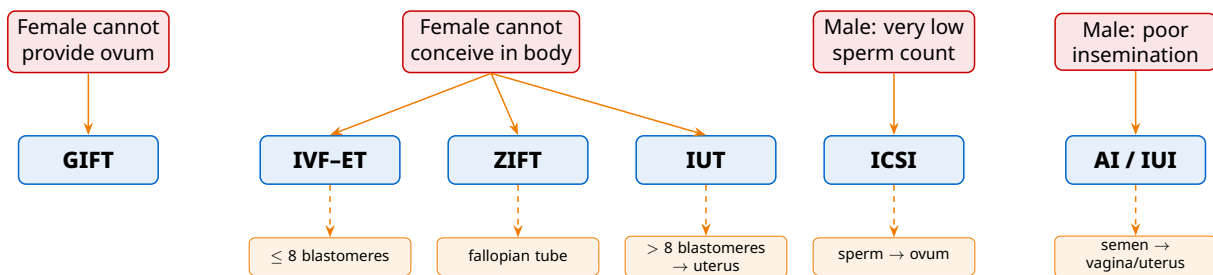
When natural correction is not possible, couples can be helped through **Assisted Reproductive Technologies (ART)**. NCERT names six techniques:

Acronym	Full name	What happens
IVF-ET	In Vitro Fertilisation – Embryo Transfer (test-tube baby)	Ova (wife/donor) + sperms (husband/donor) fused <i>in the lab</i> to form zygote/early embryo
ZIFT	Zygote Intra Fallopian Transfer	Zygote or early embryo (≤ 8 blastomeres) transferred into the fallopian tube
IUT	Intra Uterine Transfer	Embryos with more than 8 blastomeres transferred into the uterus
GIFT	Gamete Intra Fallopian Transfer	Ovum (from a donor) transferred into the fallopian tube of another female who cannot produce an ovum but can support fertilisation
ICSI	Intra Cytoplasmic Sperm Injection	A sperm is directly injected into the ovum to form an embryo in the lab
AI / IUI	Artificial Insemination / Intra-Uterine Insemination	Semen (from husband or donor) introduced into the vagina (AI) or uterus (IUI)

The 8-blastomere rule

The cut-off that NEET examiners ask about: embryos with **up to 8 blastomeres** → **ZIFT** (fallopian tube). Embryos with **more than 8 blastomeres** → **IUT** (uterus). Mix up these two and the mark is gone.

8.3 ART Flowchart



Six ART acronyms

“I Zip GI’d AI” — **IVF-ET, ZIFT, IP-T** (sorry: IUT), **GIFT, ICSI, AI/IUI.**

Cleaner version: *‘If Zoo Iguanas Got Sick Inject Antibiotics’* → **IVF** → **ZIFT** → **IUT** → **GIFT** → **ICSI** → **AI.**

Memorise the differentiators: **ZIFT** = zygote in fallopian tube; **IUT** = > 8 blastomeres in uterus; **GIFT** = donor gamete in fallopian tube of recipient; **ICSI** = direct sperm-into-ovum injection.

8.4 Limitations of ART

NCERT is explicit about why ART has not solved infertility for everyone:

- Requires **extremely high precision handling** by specialised professionals.
- Needs **expensive instrumentation**.
- Available in only **very few centres** in the country.
- Affordable to only a **limited number of people**.
- **Emotional, religious and social factors** also deter adoption.

NCERT's recommended alternative: legal adoption — the textbook notes that India has many orphaned and destitute children who would otherwise not survive to maturity, and adoption is described as “*one of the best methods for couples looking for parenthood.*”

Real-World Application

The first IVF–ET baby in the world (Louise Brown, UK, 1978) and India's first IVF baby (*Durga / Kanupriya Agarwal*, Kolkata, 1978 — born just 67 days after Louise Brown, under Dr Subhas Mukhopadhyay) are landmark cases for the **test-tube baby programme**. India was an extremely early adopter, but the technique took several decades to become widely available.

Quick Tip

A common NEET stem: “Which ART transfers an embryo with > 8 blastomeres into the uterus?” → **IUT**. Confusing it with ZIFT (zygote, fallopian tube) is the standard trap.

9 Quick Reference Summary

9.1 Key Definitions

Definitions you must reproduce verbatim

Reproductive health: total well-being in *physical, emotional, behavioural and social* aspects of reproduction (WHO).

Amniocentesis: sampling of amniotic fluid to test fetal cells for genetic disorders (banned for sex determination).

Contraception: prevention of fertilisation/implantation; tools include 7 categories.

MTP: intentional/voluntary termination of pregnancy before full term (induced abortion); legalised in India in 1971.

STIs / VDs / RTIs: infections transmitted through sexual intercourse.

Infertility: inability of a couple to produce children despite unprotected sex-

ual cohabitation.

ART: special techniques (IVF-ET, ZIFT, IUT, GIFT, ICSI, AI/IUI) used to help infertile couples have children.

9.2 Key Numbers and Years

Census-grade numbers

1951 — Family Planning programme launched in India (first country in the world).

1971 — MTP legalised in India.

1994 — PCPNDT Act (legal teeth against prenatal sex-determination).

2011 — India's growth rate < 2%/year, population 1.2 billion.

18 & 21 years — statutory minimum marriage age (female, male).

Days 10-17 — fertile period of the menstrual cycle (periodic abstinence).

21 days on, 7 days off — oral pill regimen.

72 hours — emergency contraception window.

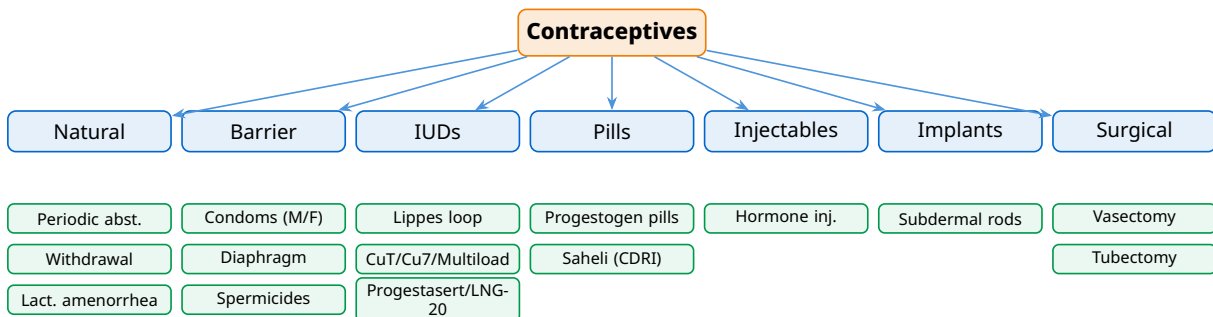
12 weeks — safe MTP cut-off (first trimester).

45-50 million — worldwide MTPs per year (1/5 of pregnancies).

15-24 years — highest STI-incidence age group.

8 blastomeres — ZIFT (fallopian tube) vs IUT (uterus) cut-off.

9.3 Master Contraceptive Tree



9.4 Master STI & ART Card

STI & ART exam card

STIs (NCERT list): Gonorrhoea, syphilis, genital herpes, chlamydiasis, genital warts, trichomoniasis, hepatitis-B, HIV/AIDS.

Incurable: Hepatitis-B, genital herpes, HIV/AIDS.

Curable: Gonorrhoea, syphilis, chlamydiasis, trichomoniasis, genital warts.

Non-sexual routes (Hep-B, HIV): needles, surgical instruments, transfusion, infected mother → foetus.

ART acronyms:

- **IVF-ET** — in-vitro fertilisation + embryo transfer (test-tube baby).
- **ZIFT** — zygote/embryo (≤ 8 blastomeres) into fallopian tube.
- **IUT** — embryo (> 8 blastomeres) into uterus.
- **GIFT** — donor ovum into fallopian tube of female who cannot produce one.
- **ICSI** — single sperm injected directly into ovum.
- **AI / IUI** — artificial insemination (vagina / uterus).

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