

Introduction to Cryotherapy



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Total	150 (2.5 hours)

Treatment of Cervical Intraepithelial Neoplasia (CIN)

Cervical premalignant lesions can be treated either by an ablative method (cryotherapy or thermal ablation) or by excision, depending on certain criteria

Principles of treatment of cervical intraepithelial neoplasia (CIN)-

1. The entire transformation zone undergoes HPV-induced clonal change and is at risk of developing CIN. Therefore, the whole TZ should be treated (ablated or excised), irrespective of the size of the lesion
2. High-grade CIN lesions often extend into the crypts present in the TZ. The depth of the crypts can be up to 5 mm. During ablative treatment, the tissue destruction must extend up to 7–8 mm to ensure complete clearance of disease
3. Low-grade lesions/CIN1 lesions should be treated when follow-up is not guaranteed
4. CIN2 and CIN3 lesions should always be treated except in very young women (younger than 25 years)
5. The decision to treat a CIN lesion may be based on colposcopic findings (“see and treat”) without waiting for histological verification
6. Ablative or excisional treatment can be performed for VIA- or HPV -positive women without colposcopic or histological verification (“screen and treat”) in situations where these diagnostic services are not available

Section 1 – Introduction to Cryotherapy

Learning Objectives

1. Understand Principle of cryotherapy
2. Identify eligibility criteria for treatment with cryotherapy
3. Describe all the parts of a cryotherapy unit
4. Identifying requirements for cryotherapy at health facility

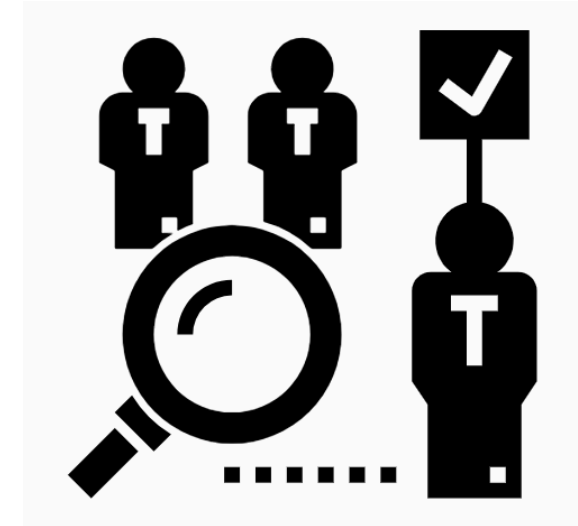
Treatment by Cryotherapy - Principle

- Cryotherapy is an ablative technique for treatment of ectocervical lesions
- It uses the freezing effect of compressed refrigerant gases like nitrous oxide (N₂O) or carbon dioxide (CO₂) to destroy the abnormal TZ of the cervix
- The compressed gas is delivered on to the surface of ectocervix through cryoprobes made up of highly conductive metals (like silver or copper)
- When the gas is applied to the cervix, the tissue temperature is reduced to -20 °C, causing permanent damage to the epithelial cells
- The ectocervix has sparse sensory nerve endings. As a result, an ectocervical procedure like cryotherapy does not require any anesthesia

Indications for Cryotherapy

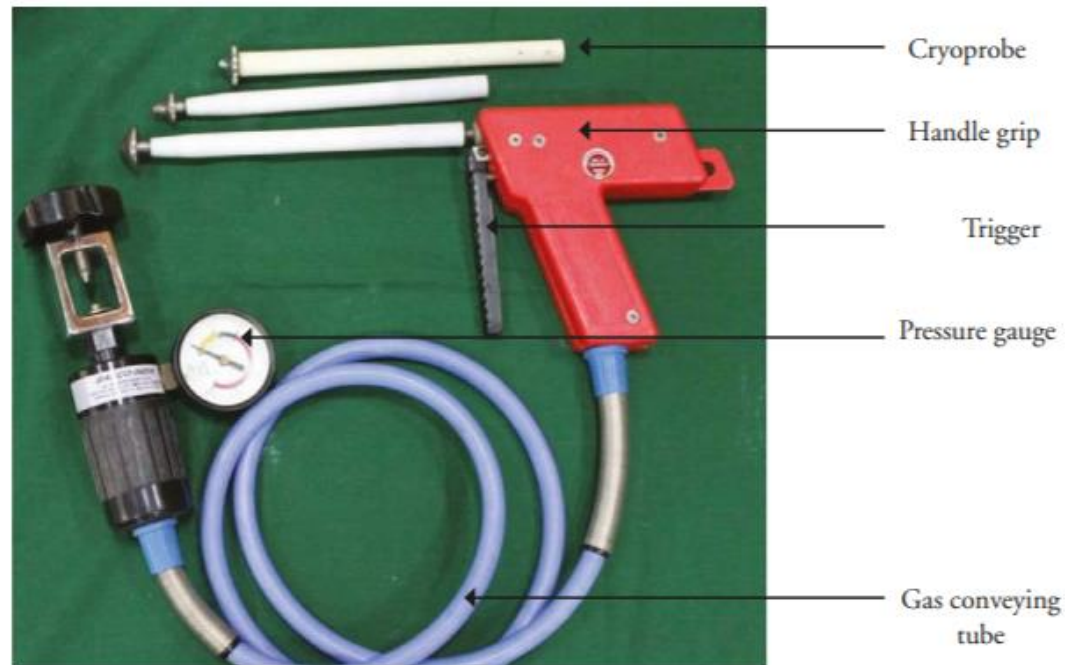
VIA test-positive women are eligible for Cryotherapy/Thermal ablation if –

1. Entire lesion is visible on ectocervix
2. Lesion is not extending to the endocervical canal or to vagina
3. Lesion is occupying less than 75% of the ectocervix
4. The size of the lesion should be such that it can be covered by the tip of the largest cryotherapy probe
5. There should be no evidence or suspicion of cancer or glandular abnormality
6. Woman should not be pregnant at the time of treatment
7. Woman should not be menstruating at the time of treatment
8. If the woman has recently delivered, she is at least 3 months post-partum
9. Woman should not have pelvic inflammatory disease at the time of treatment
10. Endocervical canal is normal and there is no evidence of glandular dysplasia



Cryosurgical Unit

- Cryotherapy equipment consists of a **handle grip (cryogun)** with a trigger mechanism that is attached to the **cryoprobe** on one side and the connecting hose on the other side to transmit gas from the gas cylinder
- Hose is connected to the cylinder with a connector and a **pressure gauge**.
- In some equipment, the cryogun is replaced by a **cryoshaft**
- Cryoprobe or the cryoshaft has a cryotip made of highly conductive metal. The protrusion of the nipple of the cryotip should not **exceed 5 mm**



Setting up Cryosurgical Unit (1/2)

- Check the washer before attaching the cryoprobe to the handle grip (cryogun). Replace the washer if it is broken
- Select the appropriately sized cryoprobe, depending on the size of the transformation zone, and attach it to the handle grip (avoid using the probes with endocervical extension)



- Connect the cryotherapy machine to the gas cylinder and tighten the valve
- Open the gas cylinder so that the gas can flow into the handle grip through the hose. Check the gas pressure indicated on the pressure gauge

Setting up Cryosurgical Unit (2/2)

- The ideal gas pressure required to perform the cryotherapy procedure is 40–70 kg/cm²
- On opening the cylinder and during the cryotherapy procedure, the indicator of the pressure gauge should be in the green zone. A needle positioned in the yellow zone indicates low gas pressure, and in the red zone indicates high gas pressure. In either case, cryotherapy should not be started or should be discontinued
- Large gas tanks (> 15 litre capacity) should be used for the procedure if possible



Equipment and Consumables for Cryotherapy

- Examination table
- Light source
- Cusco's speculum
- Disposable gloves
- Cotton swabs for wiping the cervix
- Normal saline solution
- Dilute Acetic acid (5%) solution (freshly prepared)
- Lugol's Iodine
- Cryosurgery unit with adequate gas supply
 - Cryogun
 - Cryoprobes
 - Gas conveying tube
 - Pressure gauge
 - Gas cylinder connector



Section 1 – Introduction to Cryotherapy

Learning Outcomes

1. Cryotherapy is an ablative method for treatment of ectocervical precancerous lesions
2. It uses the freezing effect of compressed refrigerant gases – N₂O/CO₂
3. Cryotherapy destroys the TZ by crystallization of water and denaturation of proteins
4. The entire lesion should be visible on the ectocervix, fully covered by the cryoprobe, occupying less than 75% of ectocervix with no suspicion of cancer

Section 2 – SOP for Cryotherapy

Learning Objectives

1. Perform the technique of cryotherapy following the correct steps
2. Follow infection prevention practices during cryotherapy

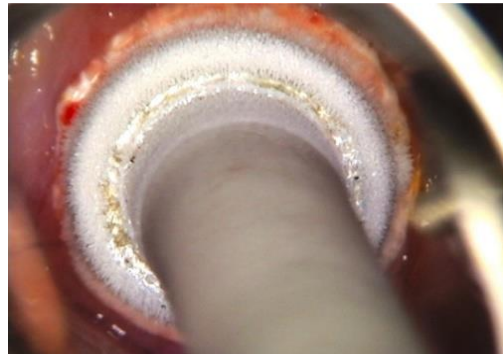
SOP for Cryotherapy

- Counsel the woman, ensure that the woman has understood the procedure and obtain informed written consent
- Ensure that woman has emptied her bladder
- Re-evaluate the lesion and ensure that:
 - The lesion is completely in ectocervix, without extension to endocervix and/or vagina
 - The lesion does not extend to more than 75% of the cervix
 - The lesion can be fully covered by the largest cryotip
 - The lesion does not have any features suspicious of cancer
- Check the pressure inside the gas tank. It should be in the green zone as indicated in the pressure gauge of most of the cryotherapy models
- Insert the speculum gently and expose the cervix properly
- Apply 5% acetic acid to outline the abnormality and wait for a minute, followed by Lugol's Iodine to delineate the limits of the lesion
- Choose an appropriate size cryoprobe that adequately covers the lesion. Attach the probe to the handle grip (cryogun)

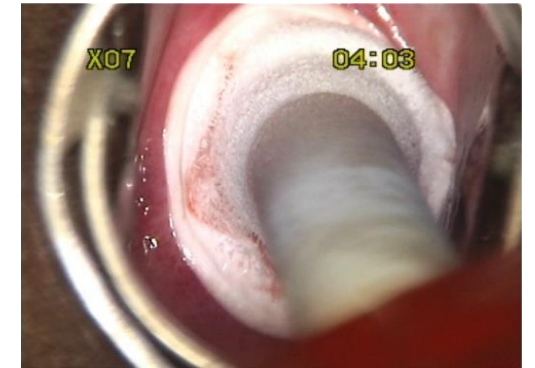
SOP for Cryotherapy

- Wipe the cryotip with saline or lubricant, to ensure adequate thermal contact
- Apply the cryoprobe tip at the external os of the cervix
- Ensure that the vaginal wall is not in contact with the cryoprobe or you may cause a freezing injury to the vagina
- Release the gas by pressing the trigger on the cryogun and hold it for 3 mins

- You will observe the ice forming on the tip of the cryoprobe and on the cervix



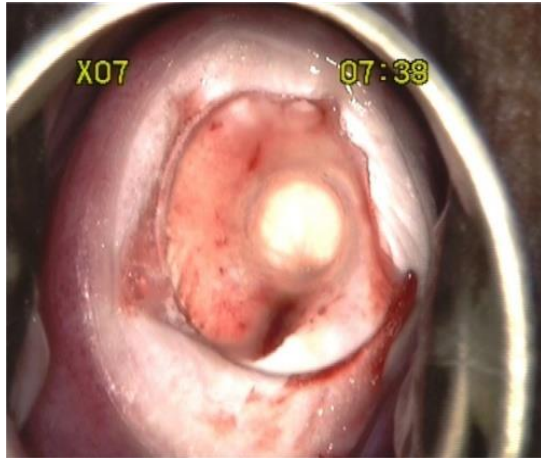
- When the frozen area extends 4–5 mm beyond the edge of the cryoprobe, freezing is adequate. This will ensure cryonecrosis occurs down to 5 mm of depth



- Release the trigger and allow thawing for 5 minutes. Repeat freezing for 3 more minutes
- After second freezing, allow time for thawing. **Do not pull cryoprobe till it comes out on its own**

SOP for Cryotherapy

- The cervix will have a white crater, which indicates that the cervix is properly frozen



- Gently remove the cryoprobe and remove the speculum after careful inspection of the cervix
- Examine the cervix for bleeding. If bleeding is noted, apply Monsel's paste. Do not pack the vagina
- Ask the woman to continue lying down for 5 minutes before letting her getting up
- Document treatment completion in individual case record form
- Provide her the date for next follow up and emphasize on the importance of it
- After use, the probe tip should be wiped with 60-90% ethyl or isopropyl alcohol and then cleaned well with boiled water and disinfected and kept dry
- After the procedure is completed, the cryogun, tubing, pressure gauge and gas tank should be de-contaminated by wiping with cotton soaked with 60-90% ethyl or isopropyl alcohol

Section 2 – SOP for Cryotherapy

Learning Outcomes

1. Informed and written consent should be obtained for cryotherapy
2. Check that cryotherapy instruments and gas tanks are ready for use before procedure
3. Apply 5% dilute acetic acid and identify:
 - SCJ
 - TZ and area to treat
 - Limits of the lesion
4. Take precautions so that the cryoprobe tip does not inadvertently touch any part of the vagina
5. Check for adequate pressure (40–70 kg per cm²) in the gas tank, indicated by the green zone in most models of the equipment
6. Inspect the cervix to ensure that the ice ball forming on the cervix extends outside the rim of the cryoprobe by 4–5 mm
7. Advise about post-treatment care and follow-up instructions
8. Complete the documentations to record the treatment

Section 3 – Post Cryotherapy

Learning Objectives

1. Correctly decontamination all equipment post cryotherapy
2. Recognize probable treatment complications
3. Offer appropriate management of complications
4. Perform appropriate follow-up after treatment

Decontaminate Cryotherapy Unit

After treatment by cryotherapy, the cryo probe should be sterilized thoroughly before re-using it. This can be done by following these simple steps-

- Decontaminate by wiping with ethyl alcohol 60–90%
- Dip the probe in clean water
- Scrub any visible biological matter on the probe tip with a cotton swab and wash with clean water
- Soak the probe in any one of the following chemicals:
 - 0.5% chlorine solution for 20 minutes
 - 2% glutaraldehyde for 20 minutes
 - 6% hydrogen peroxide solution for 30 minutes
- Rinse the probe thoroughly with sterile water
- Air-dry or dry it with a sterile cloth Clean the cryoprobe shaft and the rest of the cryotherapy unit by wiping with cotton soaked in 60–90% ethyl or isopropyl alcohol

Make sure that the inside hollow part of the cryoprobe is completely dry before the next use (water inside the probe may freeze and the probe could crack, thus interfering with proper treatment)

Side Effects and Complications

Cryotherapy is a safe procedure with no significant operative morbidity. The possible side-effects and complications are-

- A little discomfort or cramping in the lower abdomen during and after the procedure
- Watery vaginal discharge for 4–6 weeks
- Pelvic infection, requiring antibiotics and supportive treatment – rare
- Excessive bleeding, requiring hospital admission or blood transfusion – extremely rare
- Stenosis of the cervix (late complication) – extremely rare
- Vaginal pain if the probe with the ice ball touches the vaginal walls

Some women may feel light-headed if they get up from the table immediately after the procedure. Ask the woman to continue lying on the bed for 5–10 minutes after the procedure, to avoid this side-effect

Post-Treatment Care

- Provide a sanitary pad
- The woman should be told that she may experience excessive watery discharge for up to 4 weeks. She should not get worried about it
- Instruct the woman to abstain from intercourse for 4 weeks
- Avoid douching or use of tampon for 4 weeks
- Inform her of possible complications and ask her to return immediately if she notes any of the following:
 - Fever with temperature higher than 38 °C lasting for more than 48 hours
 - Severe lower abdominal pain
 - Foul-smelling or pus-like discharge
 - Bleeding for more than two days or bleeding with clots
- If the woman develops any of the above-mentioned symptoms, she should be asked to report it and seek medical advice
- The woman should be advised not to have sexual intercourse for 4–6 weeks, or until the watery discharge disappear completely
- The woman should be advised regarding the follow-up schedule

Point to note: Antibiotics are not routinely prescribed after cryotherapy. Paracetamol tablets may be given for 1 or 2 days for pain.

Follow-up after Cryotherapy

- The woman may be advised to come back for a check-up after 1 month to exclude infection or other complications
- No screening or speculum examination or colposcopy should be done
- The biopsy report, if available, should be reviewed. In a screen-and-treat programme, this follow-up visit is often omitted
- The next check-up should be done after 8–12 months, when the woman may have the screening test originally performed or a direct colposcopic examination
- If there is a persistent lesion at follow-up, it is preferable to excise the lesion, although cryotherapy may be repeated if the usual criteria for cryotherapy are fulfilled



Common Problems Encountered during Cryotherapy and their Management

Problems	Reason	Suggested solution
Gas stops flowing	Gas tank is empty	Arrange for a new gas cylinder
	Nozzle is blocked by impurities in the CO2 gas	Dip the tip of the nozzle in a small bowl of water and flush it by pressing the trigger of the cryogun until the blockage is cleared
Gas leakage from the hand unit	The washer/O-ring is either missing or is broken	Change washer/O-ring (usually provided by the manufacturer in the cryo unit) and put in a new appropriately sized washer
Pressure gauge indicator is in the yellow zone	Inadequate gas in the cylinder	Stop performing cryotherapy and change the gas cylinder
Difficulty in exposing the cervix	Laxity of vaginal walls	<ul style="list-style-type: none"> • Put a condom or the cut finger of a glove on the speculum • Insert lateral vaginal wall retractors • Use a wooden spatula to push away vagina from between the blades of the speculum

Section 3 – Post Cryotherapy

Learning Outcomes

1. Watery discharge or spotting can occur until 4 weeks after cryotherapy
2. Complete abstinence should be followed for 4 weeks after the procedure
3. Follow-up is recommended after 1 year of the treatment
4. The woman should report immediately if she has any of the following symptoms:
 - foul smelling discharge
 - fever of more than 38 °C
 - heavy vaginal bleeding or severe lower abdominal pain occur within 4 weeks of treatment

Thank you!