



**International Federation of Gynecology and Obstetrics**



# Treatment of Cervical Precancerous Lesions using Thermocoagulation (Cold Coagulation) and Cryotherapy



# General Principles

- All high grade CIN should be treated
- Low grade CIN: review after 1 year or treat (if you are not sure about compliance to follow-up)



# Principles of Treatment of CIN

- Whole transformation zone to be treated
- Minimum depth of treatment is 7 mm
- Surveillance of treated patients to assess cure / failure

# Treatment for CIN

## Ablative treatment

- Cryotherapy
- Electrocoagulation
- Thermocoagulation  
(Cold coagulation)
- Laser ablation

## Excisional treatment

- Loop Electrosurgical  
Excision Procedure  
(LEEP)
- Laser excision
- Cold knife conization
- Hysterectomy



# Types of Transformation Zone (TZ)

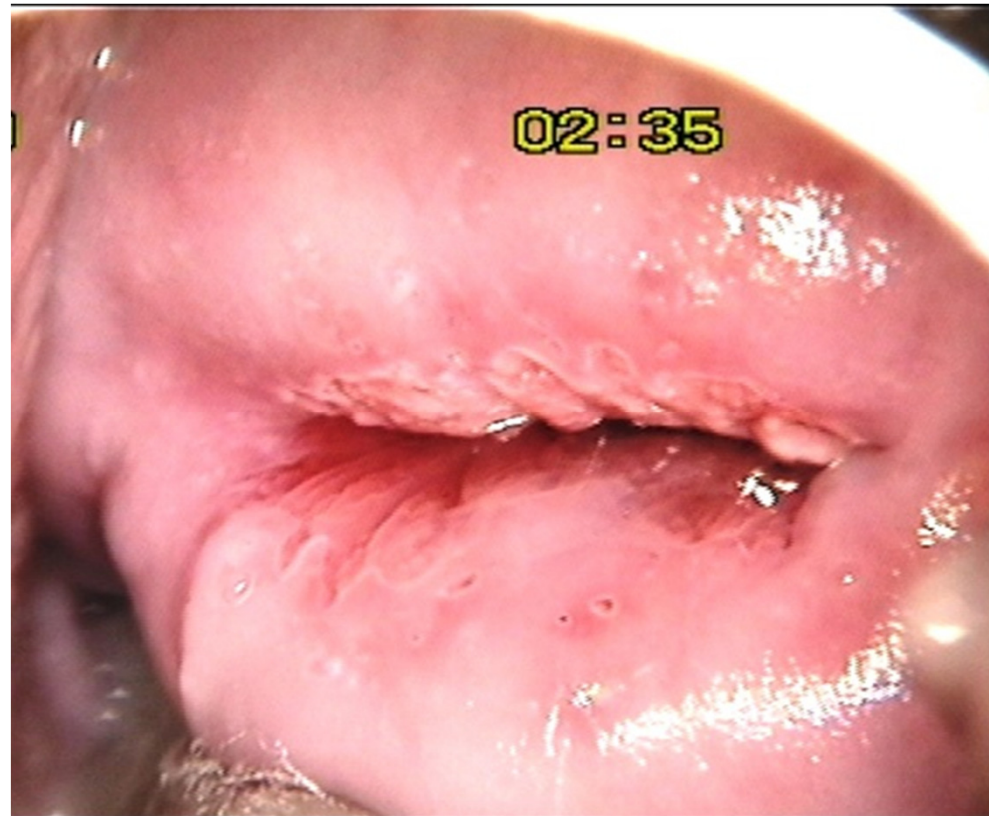
- Type 1: TZ fully visible – SCJ fully visible
- Type 2: TZ partially visible – SCJ partially visible in endocervical canal, can be exposed with special instruments
- Type 3: TZ not visible – SCJ not seen even with endocervical instruments

SCJ = Squamocolumnar Junction

## Type 1: TZ fully visible – SCJ fully visible

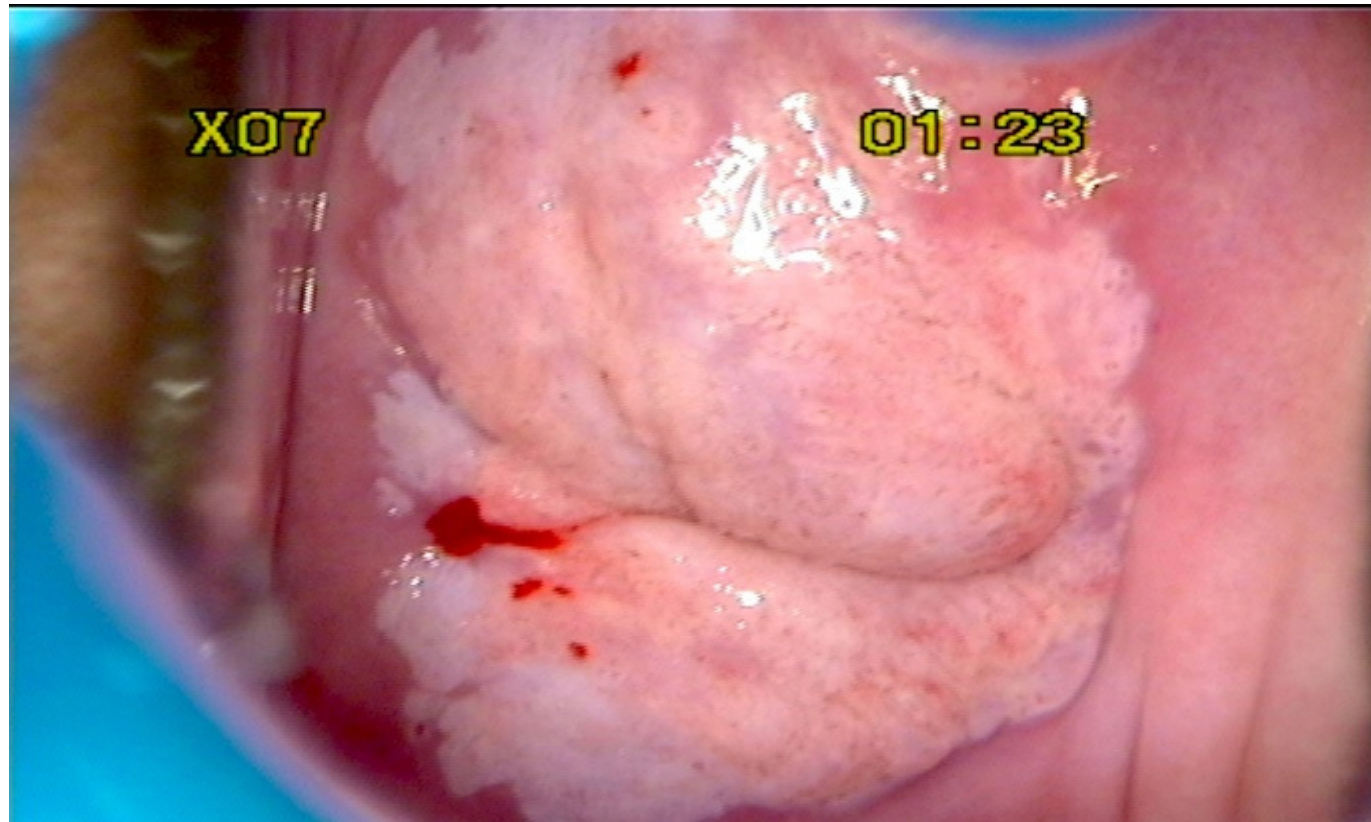


## Type 2: TZ partially visible – SCJ partially visible





## Type 3: TZ not visible - SCJ not seen



## Ablative Treatment - Criteria

- Type 1 TZ (fully visible: can trace SCJ in its entirety)
- Lesion involves <75% of transformation zone
- Lesion is entirely located on the ectocervix
- No endocervical canal or vaginal involvement by lesion
- No evidence of invasive cancer
- Patient is not pregnant
- Not menstruating

*N.B. Can direct a biopsy safely before ablative treatment!*

# Cryotherapy

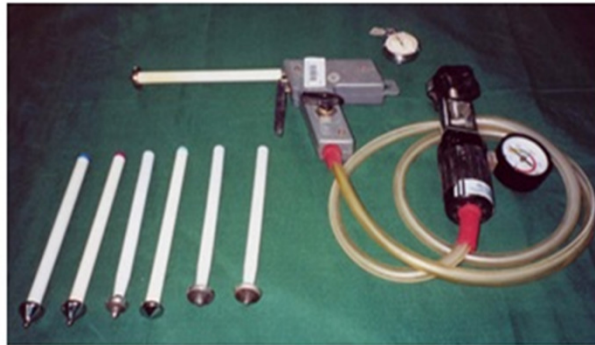
- Safe procedure with “no” complication
- Action by crystallizing intracellular water
- Temperature at the core of the ice ball varies with gas used :  
 $\text{N}_2\text{O} : -89^\circ\text{C}$ ;  $\text{CO}_2 : -68^\circ\text{C}$
- Temperature at the edges of ice ball is  $-20^\circ\text{C}$



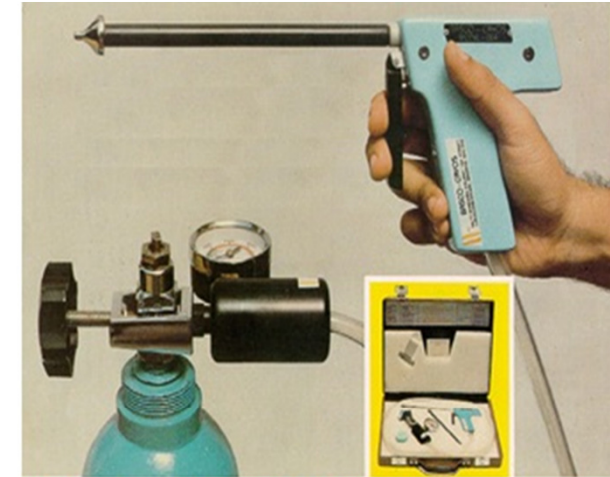
# Instruments and Equipment

- Examination table
- Halogen focus lamp
- Bivalved speculum
- Instrument tray
- Cryotherapy unit

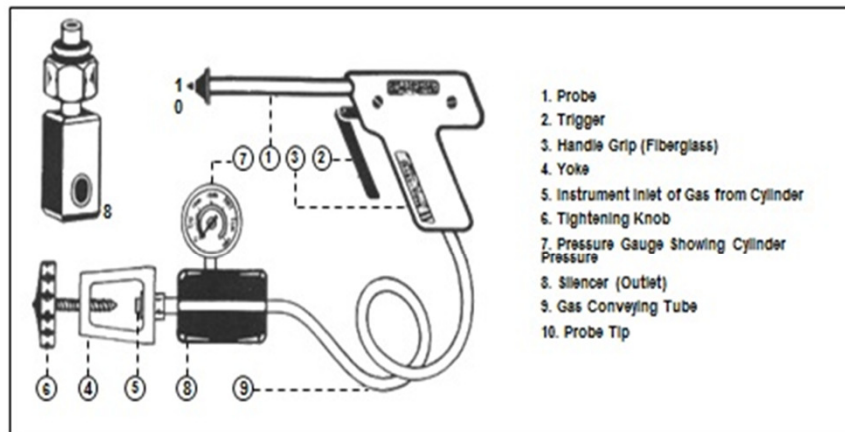
# Instruments and Equipment



Cryoprobes, the cryogun, pressure gauge and the stop watch.



Cryotherapy equipment



Cryotherapy equipment components



Cryotherapy unit connected to a large gas cylinder (covered with a clean cloth) which is safely placed on a moveable carrier.

# Cryotherapy Procedure

- Informed consent
- Patient is placed in modified lithotomy position
- Insert appropriate size speculum, expose cervix
- Remove discharge, apply 5% acetic acid, freshly prepared
- Apply Lugol's iodine, wipe the tip of cryoprobe with saline and apply the cryoprobe in the cervix
- Set timer, freeze for 3 minutes – thaw and wait 5 minutes after first freeze – repeat freezing for 3 minutes

# Cryotherapy Procedure

(contd...)

- Wait for cryoprobe to defrost, remove probe
- Inspect cervix for bleeding
- Remove speculum and reassure the woman
- Advise follow-up care



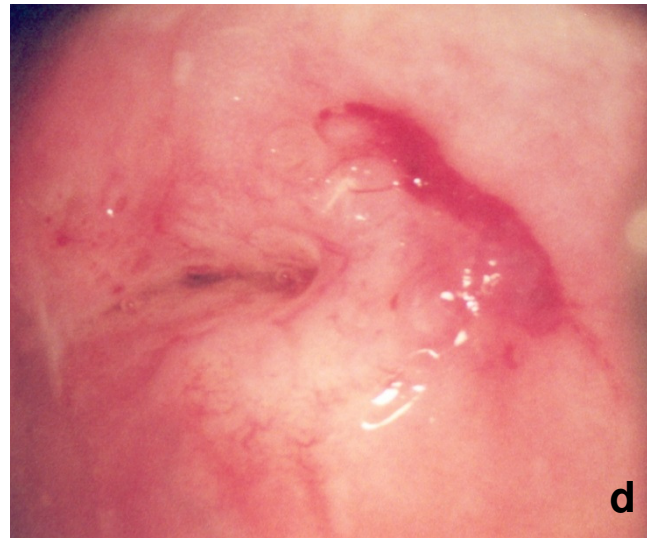
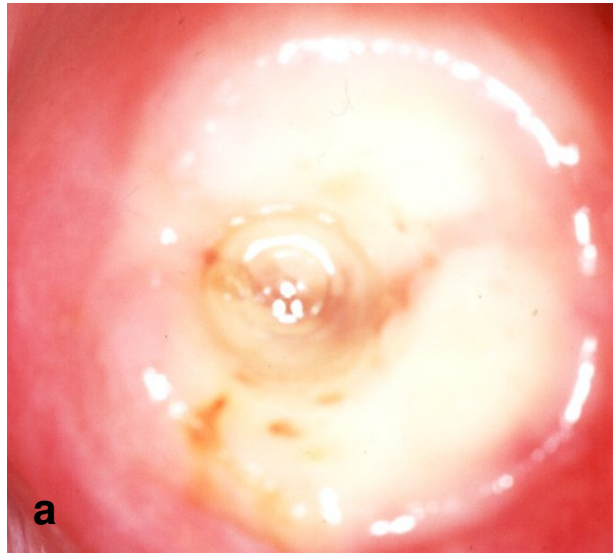


## CRYOTHERAPY PROCEDURE



**Cryofreezing in progress. Note the cryoprobe covers the lesion well (a, b). Note the iceball formation in c, d and e. Note the appearance after thawing in f.**





**(a) Note the iceball on the cervix immediately after cryotherapy; (b) Appearance 2 weeks after cryotherapy; (c) 3 months after cryotherapy; (d) 1 year after cryotherapy.**

# Effectiveness of cryotherapy in curing CIN in Indian studies

<b>Cryotherapy</b>	<b>Total</b>	<b>Cured rate at 1 year</b>
CIN 1	1550	1350 (87%)
CIN 2	159	123 (77%)
CIN 3	64	49 (77%)

Sankaranarayanan et al., Br J Cancer, 2007;96:738-43  
 Nene et al., Int J Gynaecol Obstet. 2008;103(3):232-6  
 Wesley et al., Int J Gynaecol Obstet. 2013;123(1):16-20

# Thermocoagulation (Cold Coagulation)

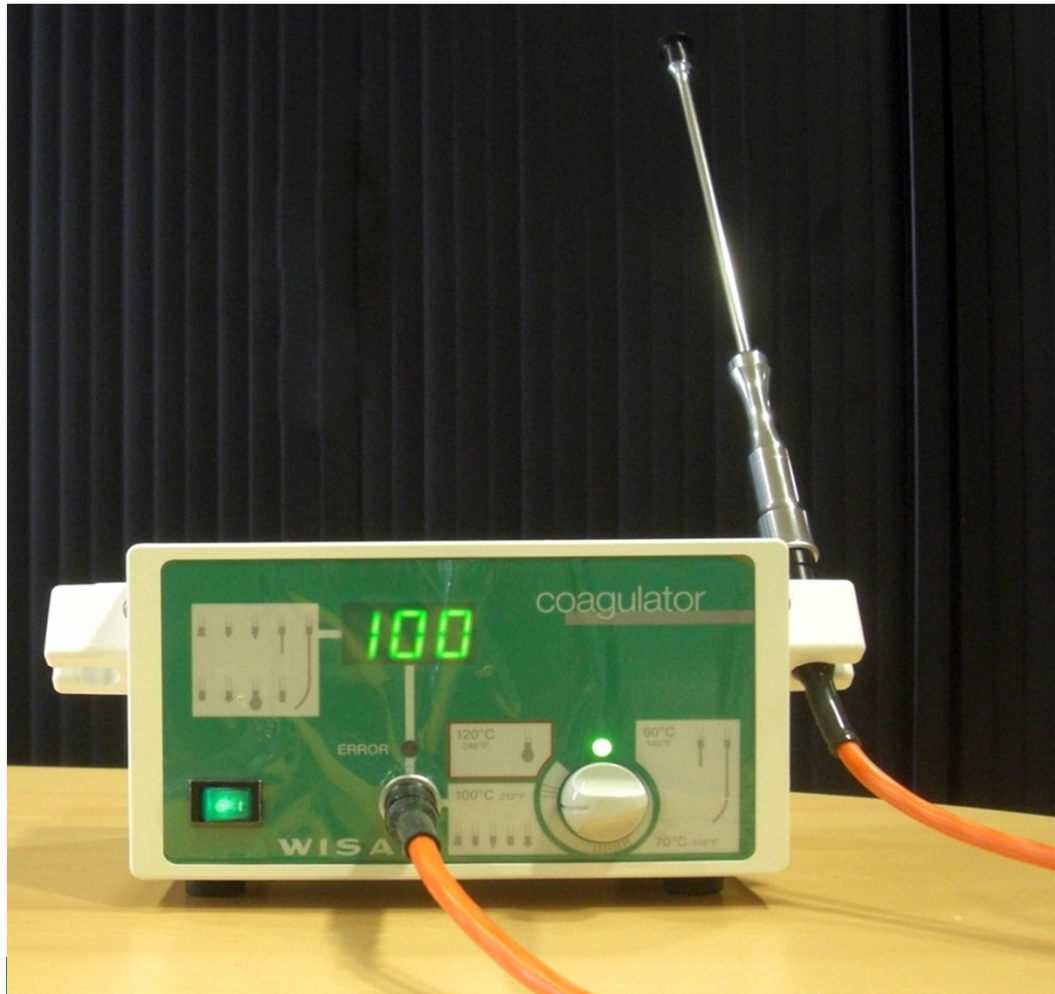
- Treatment of cervical intraepithelial neoplasia and benign cervical lesions using a metallic probe heated to 100-120°C
- Leads to thermal destruction of cervical tissue
- Depth of destruction exceeds 4 mm after 30 seconds treatment

# Thermocoagulation (Cold Coagulation): Equipment

- Semm cold coagulator
- Metallic cervical probe
- Wire for electrical connection
- Colposcope
- Cervical speculum
- Light source
- Couch



# Thermocoagulation (Cold Coagulator)





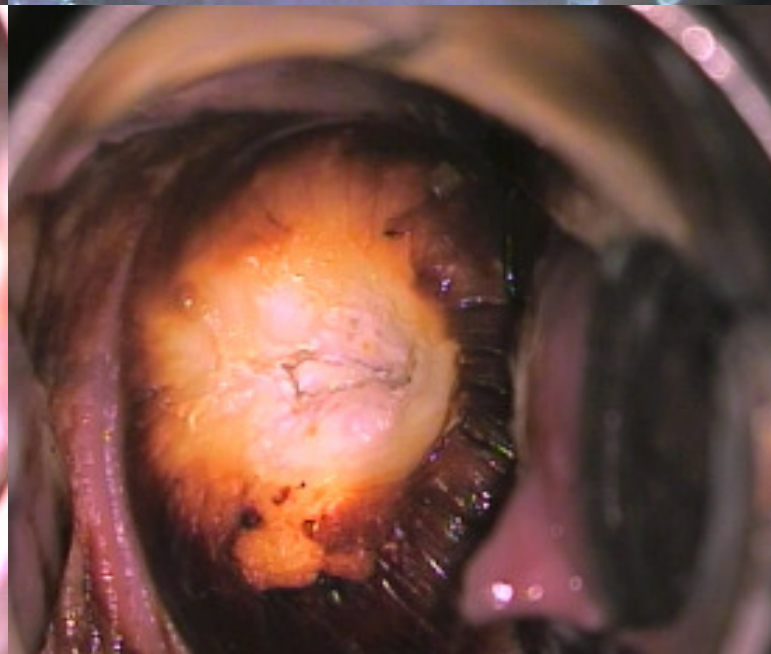
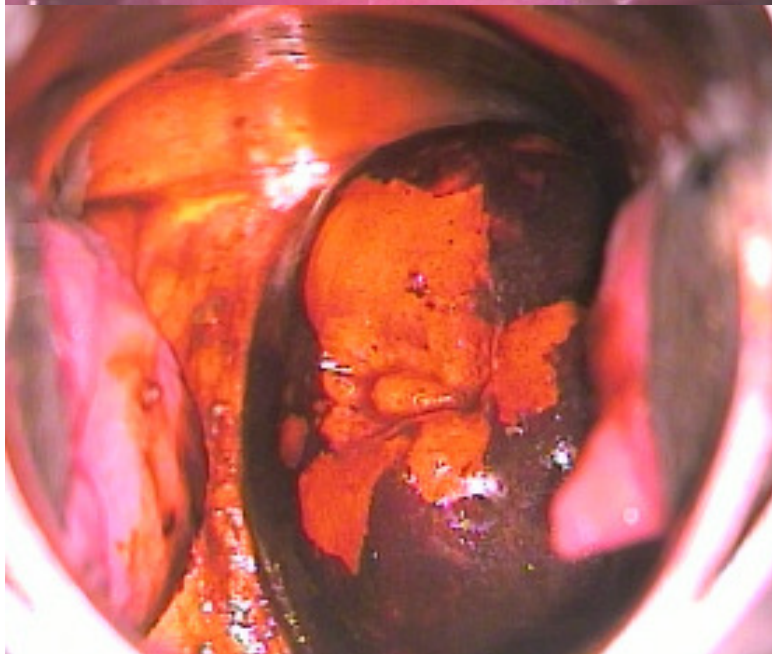
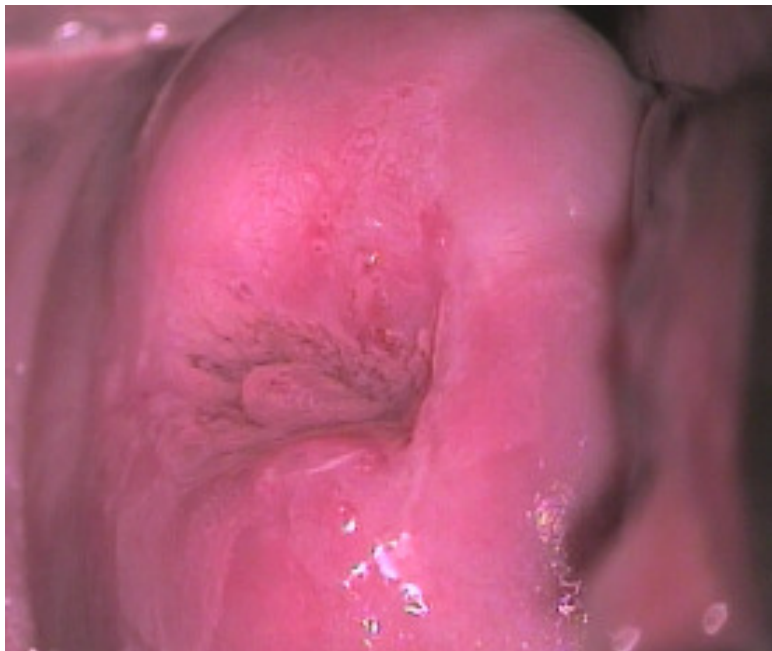
# Thermocoagulation (Cold Coagulation): Consumables

- Cotton swab
- 5% acetic acid and Lugol's iodine
- Electricity



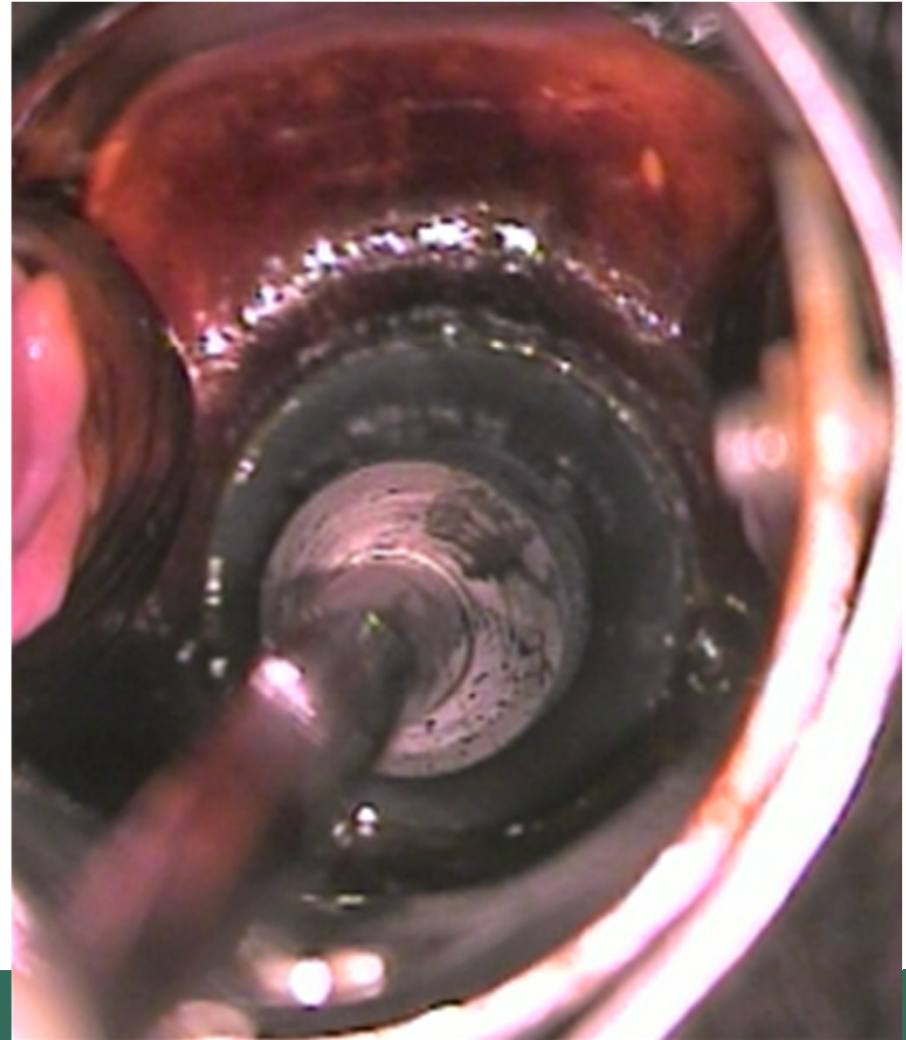
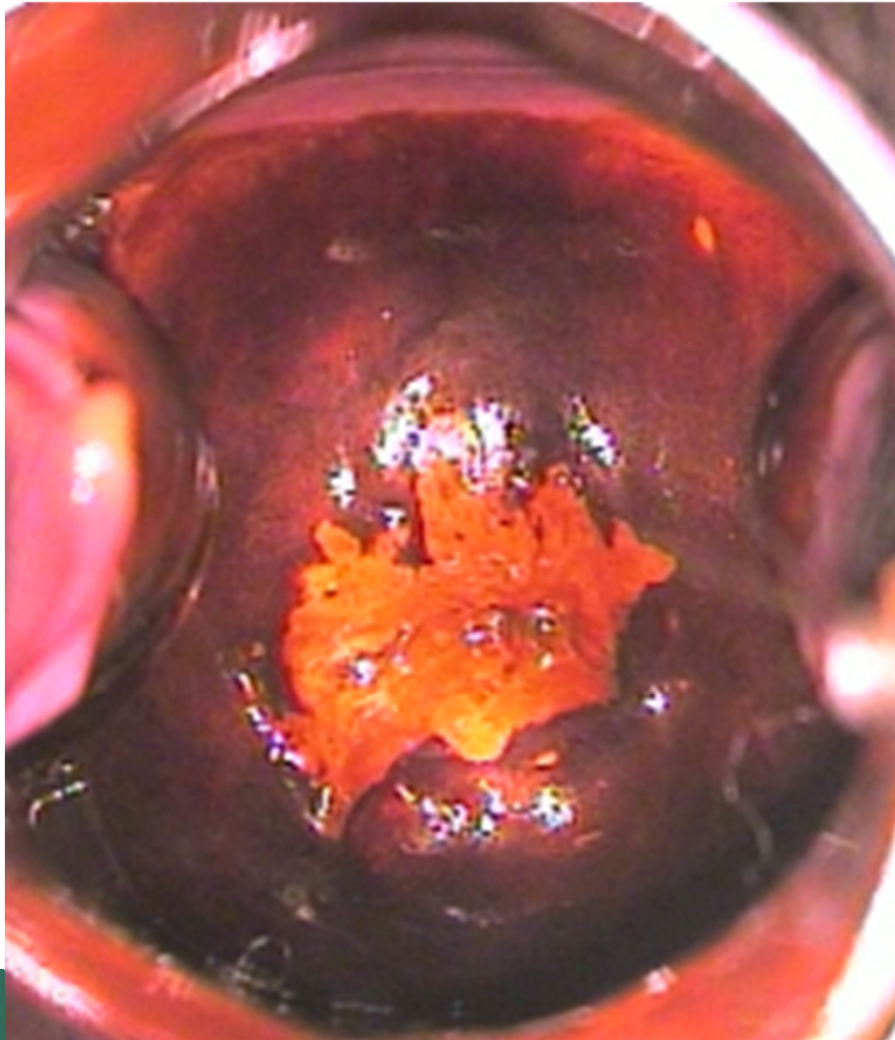
# Thermocoagulation (Cold Coagulation): Procedure

- Lithotomy position, cervix adequately exposed
- Delineation of lesion using 5% acetic acid and Lugol's iodine
- Colposcopic control where colposcope is available
- Set the thermocoagulator at 100°C
- Apply the thermocoagulator probe on the cervix and heat for 45 seconds at 100°C
- 1-5 overlapping applications of 45 seconds each can be used to cover the entire lesion
- >90% of lesions require 1-2 applications only





# Thermocoagulation (Cold Coagulation)



# Thermocoagulation (Cold Coagulation): Reuse of the treatment probe

- Wash and clean the probe after use with cold water
- Wipe it dry and heat it for 45 seconds at 120 °C
- It is ready for reuse



# Thermocoagulation (Cold Coagulation): Side effects and complications are extremely rare!

- Mild pain
- Vasovagal reactions (fainting, giddiness, mild cramps)
- Vaginal burns (careless application!)
- Bleeding (extremely rare)
- Pelvic inflammatory disease
- Cervical stenosis
- Vasovagal faints in 2/725
- Cervical bleeding in 6/725

# Thermocoagulation (Cold Coagulation): Effectiveness in curing CIN

- 95% cure rate at 1-year and 92% at 5-years among 1638 patients with CIN 3
- 96.5% cure rate among 680 women with CIN 2
- 97.1% cure rate among 485 women with CIN 1



# Cure Rate Following Thermocoagulation (Cold Coagulation): A Recent UK Experience

- 557 patients with CIN
  - 156 with CIN 1
  - 260 with CIN 2
  - 141 with CIN 3
- 1 year cure rate 95.7%
- Has a 1 year cure rate similar to that of LEEP

## Thermocoagulation (Cold Coagulation): Safety

- 17 of 1165 women complained heavy bleeding
- Of the 243 pregnancies in 1628 women treated with cold coagulation, 9 (4%) had a first trimester miscarriage and 3 (1.5%) had ectopic pregnancy

# Efficacy of *thermocoagulation* in curing cervical cancer precancer lesions

	Total Number	Number assessed	Cured
CIN 1	1,272	539	471 (87.4%)
CIN 2	221	137	113 (82.5%)
CIN 3	121	95	79 (83.2%)

Source: Results from India, Bangladesh and Brazil

## Efficacy of *cryotherapy* in curing cervical cancer precursor lesions

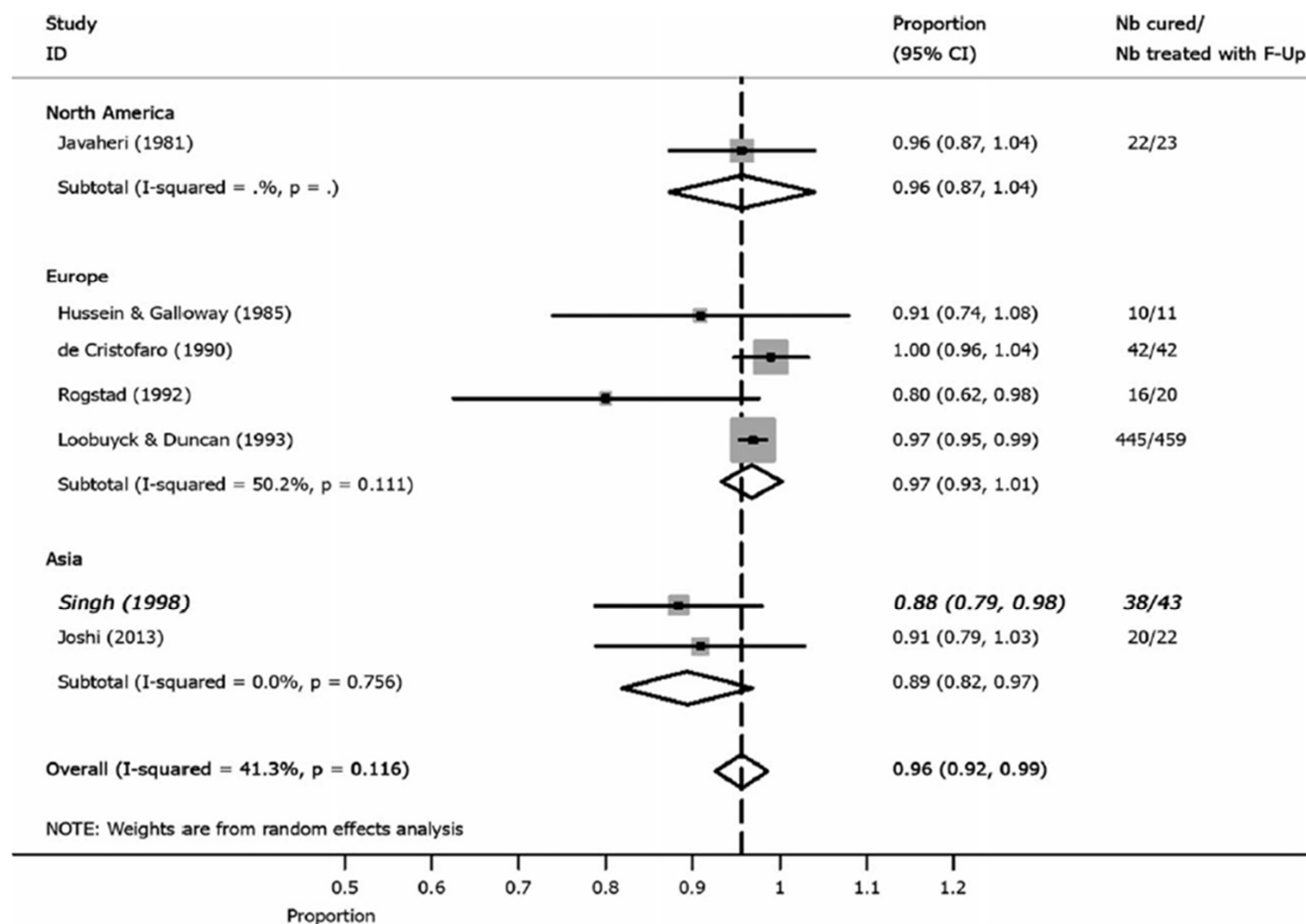
	Total Number	Number assessed	Cured
CIN 1	2,025	1,550	1,350 (87.1%)
CIN 2	221	159	123 (77.4%)
CIN 3	90	64	49 (76.6%)

Source: Results from India





# Proportion-cured estimates associated with thermocoagulation treatment for CIN1 disease, by world region





## Cryotherapy / Thermocoagulation (Cold coagulation): Post treatment instructions

- Advice on symptoms to expect: mild cramps, blood stained watery discharge
- Use of sanitary pads to prevent secretions staining their clothes
- **Avoid:**
  - sexual intercourse for 4 weeks from treatment
  - use of vaginal tampon or douche
- Report for follow-up examination after 12 months



## Cryotherapy/Thermocoagulation: Post treatment instructions

- *Report back if any of the following complaints in the 4 weeks following Rx:*
- fever for >2 days
- foul smelling purulent discharge for >3 days
- severe lower abdominal pain/cramps
- Bleeding for >2 days



## Follow-up procedures at 6-12 months from Rx

- HPV testing (if available)
- Pap smear (if available)
- VIA and VILI
- Colposcopy (if available)
- Biopsies from abnormal areas
- Repeat Rx with ablative or excisional treatment methods for residual/recurrent lesions based on clinical extent of lesions



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