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°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 stopwatch.

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

<table>
<thead>
<tr>
<th>Cryotherapy</th>
<th>Total</th>
<th>Cured rate at 1 year</th>
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</thead>
<tbody>
<tr>
<td>CIN 1</td>
<td>1550</td>
<td>1350 (87%)</td>
</tr>
<tr>
<td>CIN 2</td>
<td>159</td>
<td>123 (77%)</td>
</tr>
<tr>
<td>CIN 3</td>
<td>64</td>
<td>49 (77%)</td>
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</table>

Sankaranarayanan et al., Br J Cancer, 2007;96:738-43  
Nene et al., Int J Gynaecol Obstet. 2008;103(3):232-6  
• 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

Zawislak et al., Ulster Med J 2003; 72: 10-15
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

Gordon & Duncan, BJOG 1991; 98: 14-20
Loobuyck & Duncan, BJOG 1993; 100: 465-468
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

Gordon & Duncan, BJOG 1991; 98: 14-20
Loobuyck & Duncan, BJOG 1993; 100: 465-468
Efficacy of *thermocoagulation* in curing cervical cancer precancer lesions

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<th>Number assessed</th>
<th>Cured</th>
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<tr>
<td>CIN 1</td>
<td>1,272</td>
<td>539</td>
<td>471 (87.4%)</td>
</tr>
<tr>
<td>CIN 2</td>
<td>221</td>
<td>137</td>
<td>113 (82.5%)</td>
</tr>
<tr>
<td>CIN 3</td>
<td>121</td>
<td>95</td>
<td>79 (83.2%)</td>
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Source: Results from India, Bangladesh and Brazil
# Efficacy of cryotherapy in curing cervical cancer precursor lesions

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<tr>
<td>CIN 1</td>
<td>2,025</td>
<td>1,550</td>
<td>1,350 (87.1%)</td>
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<tr>
<td>CIN 2</td>
<td>221</td>
<td>159</td>
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<tr>
<td>CIN 3</td>
<td>90</td>
<td>64</td>
<td>49 (76.6%)</td>
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Source: Results from India
Proportion-cured estimates associated with thermocoagulation treatment for CIN1 disease, by world region

Dolman et al., BJOG. 2014;121(8):929-42.
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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On behalf of the
FIGO Committee on Gynecologic Oncology