Introduction

This is an educational and pictorial competency learning package for the use of cryotherapy and topical therapies for the treatment of genital warts and molluscum contagiosum.

The information and assessment represents the level of educational preparation and supervised clinical practice required by nurses at Melbourne Sexual Health Centre (MSHC) to competently and confidently perform cryotherapy and recommend topical therapy to clients presenting with warts and molluscum.

The information contained in this material is derived from a critical analysis of a wide range of authoritative evidence. Any treatment decisions based on this information should be made in the context of the clinical circumstances of each client.

Principles to guide nursing scope of practice decisions

The following principles help guide MSHC nurses as they expand their scope of practice to include the management of new conditions and to encourage accountable and collaborative practice.¹

Principle 1:
*The primary motivation for any decision about an episode of care is to meet the consumers health needs or to enhance outcomes.*

Principle 2:
*Nurses are accountable for making professional judgements about when an activity is beyond their own scope of practice and for initiating consultation and referral to other members of the health care team.*

Principle 3:
*Nurses are accountable for making decisions about who is the most appropriate person to perform the clinical activity.*

Principle 4:
*Nurses practice decisions are best made in a collaborative context of planning, risk management and evaluation.*
Treatment Competency Package for Nurses

Target population
Clients presenting with Genital HPV infection and Molluscum Contagiosum (MC) requiring cryotherapy and or topical therapy.

Exclusion Criteria
Clients with meatal, intra vaginal and intra anal warts
Clients with immunosuppressive illness including diabetes and Human Immunodeficiency Virus (HIV)
Clients with ongoing symptoms including multiple lesions
Clients with secondary bacterial infection
Consultation with a Medical Officer should occur prior to treating pregnant and breast-feeding clients

Objectives and anticipated outcomes
Provide treatment for clients with warts and molluscum contagiosum
Identification of individual STI risk and provision of appropriate screening
Identify population health risks to control infections by:
- Provision of STI education and information
- Identification and exploration of sexual risk taking behaviours

Introduction
Warts are a frequent presentation at MSHC. There are several commonly used treatments for anogenital warts that include cryotherapy, podophyllotoxin and Imiquimod. Studies suggest that all treatment modalities have a similar efficacy in clearing the wart virus and have similar recurrence rates after treatment. None are 100% effective and recurrences are seen in 30% of clients after treatment.

Collaborative care with evidence based treatment pathways which involve input from experienced clinicians will result in the best treatment outcomes for clients. Providing accurate information, realistic timelines and preparing the client for the temporary skin reaction and changes after treatment will assist in reducing the psychological and emotional burden associated with wart infection.

When selecting the appropriate treatment modality due consideration should be given to the following:
- Nature, size and location of warts
- Client preference and treatment tolerance
- Presence of contraindications

As frequency of clinic visits is a major determinate of MSHC cost for wart treatments, home therapy potentially reduce clinical attendance and also provide convenience for the client.

Cost of wart treatments
- Liquid nitrogen $2 per litre
- Condyline $15
- Wartec $37
- Aldara $140

Treatment Options at MSHC

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<tr>
<th>Cryotherapy only</th>
<th>Home therapy only</th>
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<tr>
<td>• Cryospray</td>
<td>• Podophyllotoxin</td>
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<tr>
<td>• Cryoprobe</td>
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Combined: cryotherapy and home therapy

No Treatment
Liquid nitrogen is nitrogen in a liquid state at a very low temperature. It is produced industrially by fractional distillation of liquid air. Liquid nitrogen is a colourless clear liquid with density at its boiling point of 0.807 g/mL. Liquid nitrogen is often referred to by the abbreviation, LN2. At atmospheric pressure, liquid nitrogen boils at −196 °C and is a cryogenic fluid which can cause rapid freezing on contact with living tissue.

Cryotherapy is the use of low temperatures in medical treatments. Cryotherapy is the application of extreme cold to destroy abnormal or diseased tissue. Cryotherapy is used to treat a number of diseases and disorders, most especially skin conditions like warts, moles and skin tags. LN2 is usually used to freeze tissues at the cellular level. The general advantages of cryotherapy are its ease of use, its low cost, low rates of side effects, and its good results.

**Mechanism of Action**

The mechanism of destruction in cryotherapy is necrosis, which results from the freezing and thawing of treated cells. Extra cellular ice forms during freezing and damages the infected cell membranes. Intra cellular ice also forms in many cells during freezing and is thought to damage mitochondria and endoplasmic reticulum resulting in cell death. The mechanism of action in cryotherapy can be divided into 3 phases, heat transfer, cell injury, and inflammation. The destruction of the affected tissue does not effect a cure from the underlying infection. (Human Papilloma Virus). The eradication of the virus by the immune system may occur some time after the lesion resolves.

**Cell Injury**

Cell injury occurs during thawing, after the cell is frozen. Because of the hyperosmotic intracellular conditions, ice crystals do not form until -5°C to -10°C. The transformation of water to ice concentrates the extracellular solutes and results in an osmotic gradient across the cell membrane, causing further damage. Rapid freezing and slow thaw maximize tissue damage to epithelial cells.

**Frost Halo**

Cell death requires 20 minutes at 0°C, 1 minute at -20°C, and is virtually instantaneous at -40°C. Therefore, a frost halo of 2-3mm around the wart is required to ensure that the entire wart is frozen adequately.

Keratinocytes need to be frozen to -50°C for optimum destruction. Melanocytes are more delicate and only require a temperature of -5°C for destruction. This fact is one reason for the resulting hypopigmentation following cryotherapy on darker-skinned individuals. Malignant skin cancers usually need a temperature of -50°C for adequate treatment, while benign lesions such as warts only require a temperature of -20°C to -25°C.
Keratinocytes are the most common type of skin cells. They make keratin, a protein that provides strength to skin, hair, and nails. Keratinocytes form in the deep, basal cell layer of the skin and gradually migrate upward, becoming squamous cells.

Melanocytes are cells located in the epidermis that are responsible for producing melanin, a brown pigment that helps screen against the harmful effects of UV light.

Inflammation
The last response to cryotherapy is inflammation, which usually presents as erythema and edema. Inflammation is the response to cell death and helps in local cell destruction. Cryotherapy treatment causes basement membrane separation, which may result in blister formation.

Treatment Modalities
Various methods have been devised in the use of cryotherapy of lesions. They include the spray freeze technique using a specifically designed canister and the cryoprobe method. Liquid nitrogen is the best and universal freezing source because of its low boiling point and its ease of use. Cryotherapy may be used for any anogenital wart that is accessible to treatment.

Cryospray
The LN2 canister is most commonly used for penile and vaginal warts. Various nozzle sizes are available to facilitate accurate targeting of wart tissue. The cryospray applies a jet of liquid nitrogen directly to the wart. The spray can be held until the wart is adequately frozen with the desired margin. In general the finer nozzles should be used to prevent overspray, unless the wart is quite large. The longer tips allow freezing of lesions in difficult locations.

Cryoprobe
The cryoprobe is generally used for mental warts, large anal warts and in areas where it is important to minimise healthy tissue destruction. The cryoprobe consists of a metal tip refrigerated by decompressed nitrous oxide. The temperature at the tip is warmer (-89°C) than liquid nitrogen and the freezing process is accordingly a little slower. Tips of various size and shape are available.
Cryospray
The spray cryotherapy technique is probably the most commonly used method at MSHC. This method is suitable for most warts and molluscum contagiosum lesions. The nozzle tip of the spray gun is held about 1 cm from the treatment site, and liquid nitrogen is sprayed on the lesion until an ice halo is formed. This process is repeated until an ice halo of the desired size is created. The time for which the lesion is frozen is the freeze time. This freeze-thaw cycle can be repeated, depending on the type of lesion being treated. Prior to freezing the lesion, the client must be informed of the procedure, and verbal consent must be obtained. A local anaesthetic gel, such as 2% or 5% lignocaine can be used prior to treatment.

Because of the differences in wart lesions at various locations in the genital area, different freeze-thaw cycles are required to produce successful treatment. The time estimates given for freeze cycles must be adjusted depending on the wart type, local circulation, skin pigment, and method of delivery. Warts can usually be treated with two 15- to 30-second freeze-thaw cycles.

General Guidelines
- Explain the procedure to the client and obtain verbal consent
- Prepare client for the potential pain, negotiate breaks in treatment
- Ensure Cryospray is adequately filled and spray nozzle is patent
- Start with the smallest warts. Freeze warts until a 2-3 mm ice halo forms
- The ice halo ensures that the necessary temperature has been achieved to cause cell necrosis
- Minimise direct spraying of surrounding skin.
- Several cycles of freezing and thawing may be required to achieve adequate freezing

This freeze demonstrates an inadequate ice halo. Only the surface of the wart has been frozen. The base of the wart will remain and retreatment will be required to clear the wart.

This freeze demonstrates an adequate ice halo. The entire wart has been consistently frozen which will result in cellular death and an inflammatory response which will assist in clearing the wart virus

An example of an adequate freeze. Waiting for the wart to thaw completely prior to retreatment is advisable.

View online wart treatment video
Cryoprobe
The cryoprobe utilises compressed Nitrous Oxide to freeze lesions. The applicator has a freeze/defreeze mechanism and is attached to a large cylinder. Manufacturers have devised various metal tips to assist in treatment of various wart sizes and locations. The advantages of using the cryoprobe are that it can be less painful as freezing can be focused on the wart for longer periods of time while leaving surrounding skin intact. The cryoprobe is useful for anal warts, meatal warts and treating warts were it is important to reduced amounts of healthy tissue is exposed to freezing.

General Guidelines
- Explain the procedure to the client and obtain verbal consent
- Prepare client for the potential pain, negotiate breaks in treatment
- Select an tip that matches the type of wart to be treated
- A small amount of water based gel can be applied to warts in order to facilitate adherence to the wart for optimal cold transfer
- Ensure there is good contact between the attachment and the wart
- Press the freeze button
- Observe progression of the freeze through the wart by raising the applicator slightly
- Once an adequate freeze has been achieved press the defreeze button
- Ensure gas is turned off after procedure

Side Effects and Complications Associated with Liquid Nitrogen Treatment
As with any procedure, complications can occur. Complications can be divided into (1) acute, (2) delayed, (3) prolonged-temporary, and (4) permanent. Acute complications include pain, and blister formation at site of freezing Delayed complications include infection, and excessive granulation tissue formation. Prolonged-temporary complications include hyperpigmentation, and change in sensation. Permanent complications include, keloids, scarring, hypopigmentation,
Contraindications

Contraindications can be divided into 2 groups: relative contraindications and absolute contraindications. Relative contraindications include cold intolerance, cold urticaria, cryoglobulinemia, history of pyoderma gangrenosum, and Raynaud disease. Absolute contraindications include the use of cryotherapy near the eye margins.

Treatment Intervals

Warts can be retreated two weeks after cryotherapy if required. Treatment sooner may result in damage to healing tissue. Large fleshy anal warts may benefit from frequent treatment.

The above photo shows healing penile skin one week after cryospray, retreatment at this stage would only damage healing tissue. An interval of two weeks is adequate to assess whether further treatment is required.

Care Following Cryotherapy

Cryotherapy produces tissue damage which may cause pain and swelling at the treatment site 24-48 hours after treatment. Blisters may weep and crust over within a few days after treatment. Usually healing occurs over one to two weeks. Temporary depigmentation is common. Avoiding waxing, shaving and genital hair removal is recommended until warts resolve.

Genital Skin Care

Clients are advised to avoid excessive use of soaps or body wash after treatment. Washing with water is advisable. The use of tea tree oil and other topical antiseptics may be counter productive to wound healing and should be avoided. Foreskin hygiene is important for warts located in foreskin folds or on the head of the penis.

Topical Analgesia

The use of topical anaesthetics are recommended for clients who experience pain after treatment. Clients with large anal warts and labial warts may experience pain. Lignocaine topical gel/ointment is available in two strengths 2% and 5%. Clients are instructed to apply the gel to affected areas as required. Panadol is effective in managing pain after cryotherapy.

Saline washes

Table salt dissolved in warm water is an effective skin wash after cryotherapy.

Potassium Permanganate

Potassium permanganate is an oxidising agent with disinfectant, deodorising and astringent properties. A potassium permanganate solution of 1 in 1000 may be used as wet soaks to blistering wounds such as ulcers and abscesses. The astringent action of potassium permanganate helps to dry out the area and prepare the wound for other treatment.
Condyline Paint (Podophyllotoxin 0.5% w/v) 22,23
Condyline is a self administered home treatment for anogenital warts. Paint 0.5%

Actions
Mitotic inhibitor (antimitotic). An extract of the mayapple plant which generally acts as a cell poison when applied to cells undergoing mitosis (division). The result is arrested mitosis in cells effected by the wart virus. There is minimal systemic absorption of podophyllotoxin at 0.5%.

Indications
• For anogenital warts Can be used in conjunction with LN2 treatment
• Use with caution in skin folds (under foreskin, labial folds) due to occlusive nature of skin and increased risk of local reactions

Client Directions
Condyline has a seven day treatment cycle which requires application twice a day (12 hours apart) for three days.
The client then has a treatment free period of 4 days.
The treatment cycle continues for one month or until the warts resolve.
• Apply only as directed onto wart
• Avoid contact with normal skin wash off paint if it comes in contact with healthy skin
• Vaseline can be used as a protection barrier on good skin
• Use new applicator for each time
• Avoid contact with broken skin

Schedule
• BD for 3 days then 4 days off
• Use for 4 weeks
• Review with MSHC after 1st treatment cycle if warts persist

Adverse Reactions
Local reactions including burning, inflammation, pain and erosion.
Burning and pain are normal on application.
Redness/tenderness to be expected.
Skin peeling/flaking expected.
Clients are advised to cease using Condyline if excessive inflammation occurs and return for review.
Recommence schedule once symptoms resolve.

Contraindications
Avoid pregnancy during treatment (category D)
Use in pregnancy and lactation is contraindicated.
Hypersensitivity to podophyllotoxin.
Client competency in using the treatment and distinguishing warts from normal skin
Wartec Cream (Podophyllotoxin 0.15% w/w)
Topical treatment of external anogenital warts

Actions
Mitotic inhibitor (antimitotic). Generally acts as a cell poison when applied to cells undergoing mitosis (division). The result is arrested mitosis in cells effected by the wart virus. There is minimal systemic absorption of podophyllotoxin at 0.15%

Indications
- For anogenital warts and warts that are difficult to access with accuracy.
  Eg: anal warts and vulval warts
- Can be used in conjunction with LN2 treatment
- Use with caution in skin folds (under foreskin, labial folds) due to occlusive nature of skin and increased risk of local reactions

Client Directions
Wartec is a seven day treatment cycle which requires application twice a day (12 hours apart) for three days.
The client then has a treatment free period of 4 days.
The treatment cycle continue for one month or until warts resolve.
- Apply only as directed onto wart
- Avoid contact with normal skin
- Vaseline can be used on normal skin as protection
- Use new applicator for each time
- Avoid contact with broken skin

Schedule
- Twice daily for 3 days then 4 days off
- Use for 4 weeks
- Review with MSHC after 1st treatment cycle if warts persist

Adverse Reactions
Local reactions including burning, inflammation, pain and erosion
Burning and pain are normal on application
Redness/tenderness to be expected
Skin peeling/flaking expected
Clients are advised to cease using Wartec if excessive inflammation occurs.
Recommence schedule once symptoms resolve.

Precautions
Avoid contact with eyes.
Avoid contact with healthy skin.
Not indicted for use on urethral or cervical warts.

Contraindications
Avoid pregnancy during treatment (category D).
Use in pregnancy and lactation is not recommended.
Application to broken skin.
Hypersensitivity to podophyllotoxin.
Client competency in using the treatment and distinguishing warts from normal skin
Aldara (Imiquimod)\(^{21,22,25}\)

Imiquimod is an immune response modifier that stimulates the body's own immune response system. There are 12 sachets each containing 250mg of cream. One sachet contains enough cream to cover a wart area of 20cm\(^2\).\(^{22,25}\)

**Actions**

It induces local cytokine production (interferon gamma, tumour necrosis factor alpha and CD4 / T cell presence) that results in the reduction of the HPV virus and therefore visible warts. Cytokines are small proteins involved in cellular communication during an immune response.

**Indications**

- Ideal for numerous wart presentations

**Client Directions**

- Apply a small amount on warts
- Rub into skin until absorbed
- Do not shower/have sex after applying Aldara for 12 hours
- If skin becomes inflamed cease use for a few days and then recommence
- Treatment areas need not be occluded or bandaged

**Schedule**

Apply once a day before bed on alternate days for three days during the week. For example: Monday, Wednesday and Friday. Continue treatment until all warts are gone (max 16 weeks). May be used for up to 16 weeks. Generally used for 4-10 weeks until clearance achieved. Prudent to review treatment progress at 6 weeks if warts still present.

**Adverse Reactions**

Mild to moderate skin reactions usually seen. Redness, swelling, scabbing, itching, burning are common and usually due to the pharmacological response of the body's immune system. If symptoms are severe cease treatment. Treatment can be commences soon after cryotherapy.

**Precautions**

- Not recommended for use in pregnancy or lactation.
- Wash off before sexual contact (Aldara weakens condoms).
- Foreskin hygiene daily to prevent adhesions if applying under foreskin.
- Occlusion dressings not recommended.
- Will exacerbate pre existing inflammatory skin conditions.
- Use with caution in organ transplant patients and immunocompromised clients.
- Avoid use around urethra of both male and female clients to reduce risk of urinary retention.

**Contraindications**

- Hypersensitivity to ingredients
- Client competency in using the treatment and distinguishing warts from normal skin
**Case Studies**

Explain how you would manage the following wart presentations.

**Clinical Questions**

For each of the cases below please answer the following questions.

- What method of cryotherapy would you use?
- How long would you freeze for?
- How many freeze cycles would you do?
- What would you explain to the client about care following cryotherapy?
- Would you recommend at topical therapy?
- When would you review the client?

**Clinical Presentations**

A  
B  
C  
D  
E  
F
On completion of this competency nurses will demonstrate competency and confidence in the treatment and management of conditions requiring cryotherapy and topical treatments.

Describe with understanding first line treatments and their effectiveness for genital warts.

Explain the mechanism of action of liquid nitrogen on skin cells

Discuss the possible complications and side effects of cryotherapy.

Discuss when you would select Cryospray or cryoprobe

Demonstrate competency in Cryospray and cryoprobe techniques

Explain when topical therapies are useful and describe their contraindications.

Describe post treatment care

Discuss evaluation of treatment and further management

Describe wart presentations which would require referral

### Clinical Log

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<tr>
<th>Date of consultation</th>
<th>Role of nurse (observed/supervised)</th>
<th>Presentation description</th>
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## Competency Package for Nurses

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**References:**


8. HPV Special Interest Group of BASHH. Anogenital warts. Sexually Transmitted Infections 2006; 82 (Suppl IV): 40-41.


