

Guideline on management and referral for cryotherapy

Professional Development & Quality Assurance

Department of Health

CONTENT

- 1. Introduction**
- 2. Indication**
- 3. Contraindication**
- 4. Role of staff in cryotherapy**
- 5. Appendix**
- 6. References**

1. Introduction

Cryotherapy is the destruction of tissue by extreme cold. It is useful for a number of benign and pre-malignant conditions.

2. Indication

The following conditions are suitable for cryotherapy in Families clinic. (3)

1. Viral wart- including plane wart, filiform wart, planter wart
2. Seborrheic keratosis
3. Actinic/solar keratosis
4. Skin tags

Special cautions should be paid and clear explanation of possible side effects should be given to the following situations. (4)

1. Procedure performed in children- may not be co-operative during the procedure
2. Wart on periungual area- may cause nail deformity
3. Lesion on face- may cause cosmetic complication
4. Lesion on elbow or digit- may cause damage to superficial cutaneous nerve injury
5. Superficial basal cell carcinoma or superficial squamous cell carcinoma- tissue pathology confirmation first before procedure
6. Genital wart - better referred to Social Hygiene service for management

3. Contraindication (3)

By lesion

Recurrent basal cell carcinoma

Melanoma

Any undiagnosed lesion suspected of malignancy (send tissue for pathology first)

Morphoea

Large vascular lesion (haemangioma)

By area

Eyelids and thin skin

Eye brow, eyelash and scalp (may kill hair follicles)

Neoplasm of ala nasi and nasolabial fold

Neoplasm of anterior tragus

Neoplasm of upper lip near vermillion border

Neoplasm over the shins

By patient

Previous adverse reaction to cryotherapy

Darkly pigmented skin (greater risk of hypo-pigmentation)

Cryoglobulinemia

Myeloma, lymphoma

Autoimmune disorders

Raynauds disease, especially when lesion is on fingers, toes, nose, ears

Chronic systemic corticosteroid therapy

Concurrent treatment with immunosuppressive drugs

Extremity with any vascular compromise

4. Role of staff in cryotherapy

1. Doctors

Before the procedure

- i. **Confirm diagnosis-** if suspected malignancy, perform skin biopsy by the responsible doctor or referring to dermatologist for confirmation.
- ii. **Explain possible complications-** including pain, infection, blister formation, scarring, pigmentation abnormality, nerve damage and cosmetic problem.
- iii. **Remind the patient on the possibility of canceling the procedure** on the day of treatment after re-assessment (since the skin condition may change with time).
- iv. **Instruct the patient to book cryotherapy.**

During the procedure

- i. **Reassess the patient and explain possible complications.**
- ii. **Explain what will happen afterwards.**
 - a. Depending on the length of time if freezing treatment, the skin will become red and may form a blister or the area may become weepy after the procedure. This is normal.
 - b. A crust will usually form in 1-2 weeks and then peel of in 3-4 weeks.
 - c. The healing process may take up to 6 weeks.
 - d. One can wash the treated area but do not soak it and we should advise the patient not to go swimming until the area has scabbed over.
 - e. Panadol may be taken for any pain after the procedure.
 - f. Dressing may be required to absorb exudates if blister ruptures.
 - g. Invite patient to come back if a painful, tense blister occurs.
 - h. Reappearance of new lesion may happen especially viral wart.
- iii. **Sign the consent**
- iv. **Give patient the information leaflet**
- v. **Wear disposable gloves and surgical mask**

vi. Perform the cryosurgery with the following recommended freezing time (5)

- a. Viral wart
 - Filiform- 5 seconds
 - Common- 10 seconds
 - Planter wart- 15-30 seconds
 - Periungual wart- 10-15 seconds
- b. Seborrhoeic wart- 10 seconds
- c. Actinic/solar keratosis- 5-10 seconds
- d. Skin tags- 5 seconds

vi. Disposable scalpel blades may be used for paring thick lesions

After the procedure

- i. **Follow-up the patient at 4 weeks or follow-up as scheduled** by the referring doctor.
- ii. **Chart the area-cycle-time in the patient's record.**

eg. Hand-1-10 for wart means 1 freeze-thaw cycle of 10 seconds given for hand wart

- iii. **Record the ID number/save a label of patient by a responsible doctor in Families clinic for future data analysis and research, ie. a registry of patients who have been given cryotherapy is recommended.**

2. Nurses

- i. Storage of the liquid nitrogen in places with good ventilation**
- ii. Prepare the cryogen gun, consent form and other relevant materials** such as alcohol swab, elastoplast, scissor, angiocath (usually 18G is optimal) and patient information leaflet .
- iii. Sign the consent form** (witness part)

3. Clerk

- i. Booking of appointment at scheduled time.**

4. Workman- Transfer the set of instrument and materials to doctor's room.

5. Appendix (1)

The following biophysical changes cause cell injury and death during cryosurgery. (1)

1.Immediate phase

- (a) Rupture of cell membrane- due to formation of large intracellular crystals. Critical temperature of cell death is between 0 degree celcius to -20 degree celcius. On termination of freezing, thawing should be slow.
- (b) Intracellular dehydration with raised electrolyte concentration
- (c) Denaturation of proteins
- (d) Cellular hypometabolism. Enzyme inhibition- poisoning of cell

2.Delayed phase

Ischaemia from thrombosis of the microcirculation. This occurs within a few hours.

3.Late phase

Antibody formation following cryosurgery against tissue.

There are several factors which affect the degree of cryonecrosis. (2)

1.Size of probe tip.

The larger the tip, the greater the volume of issue destroyed.

2.Duration of freeze.

The longer the freeze the larger the volume of tissue frozen. Maximum duration is variable, usually 5-30 seconds.

3.Body temperature and vascularity of the area.

These affect the speed and extent of freezing. The less vascular the tissue, the longer the rewarming phase and the greater the necrosis achieved.

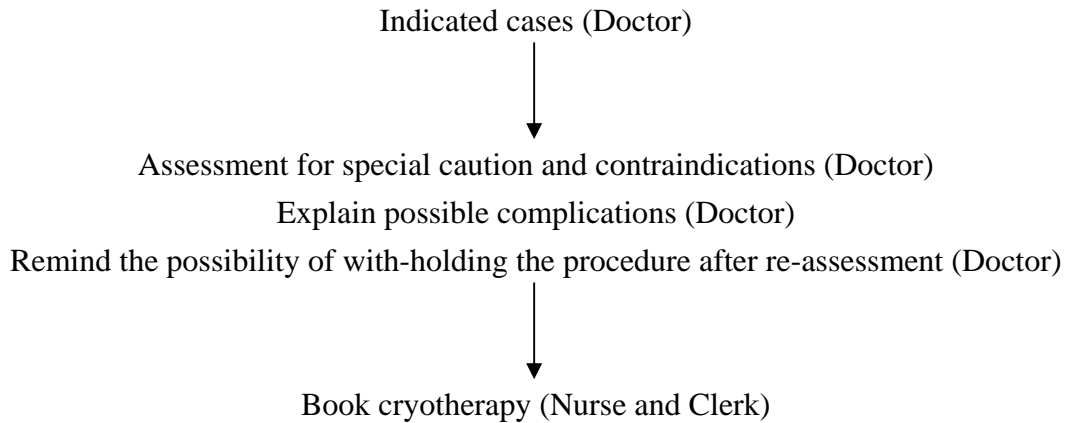
4.Tissue hydration.

Dry tissue is less liable to freezing.

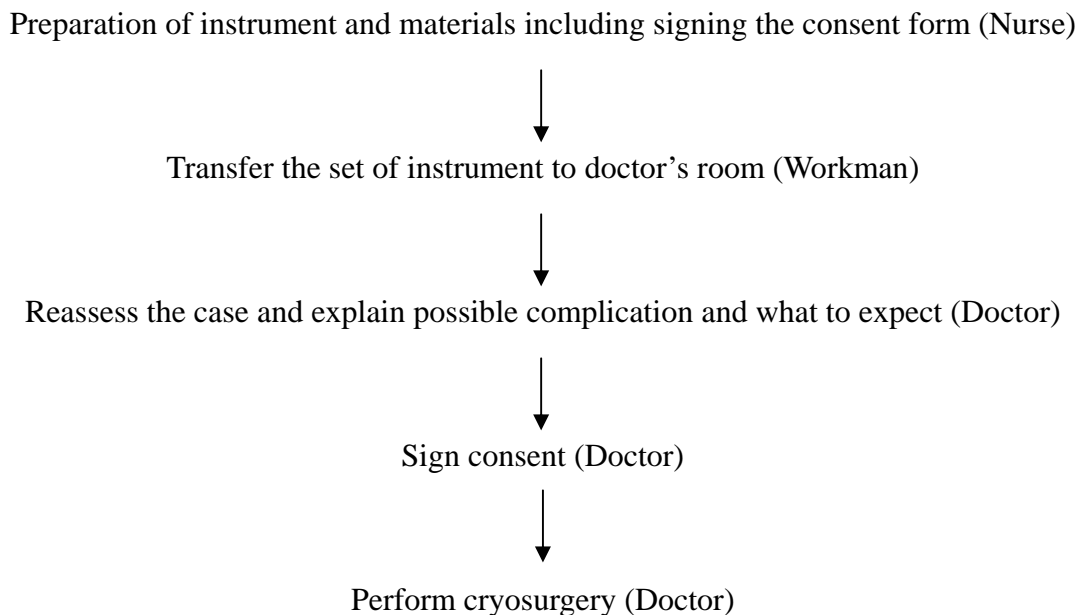
5. Appendix (2)

Suggested Flow diagram for cryotherapy procedure

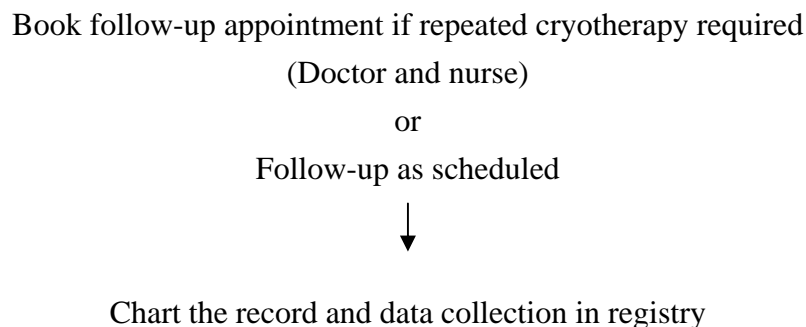
Before the procedure



During the procedure



After the procedure



5. Appendix (3)

Written information for patients undergoing Cryotherapy (English version)- See next page

Cryotherapy

Cryotherapy involves the use of cold liquid nitrogen to apply to certain diseases as described by your doctor such as wart. Your doctor would, according to the disease state, follow-up your condition in a few weeks (or as directed by your doctor).

The potential side effects of Cryotherapy are:

1. Wound pain that usually subsides in a few days.
2. There is sometimes change in colour of the treatment site.
3. Blistering may occur after 24 hours which usually heal in 3-4 weeks. Do not pierce the blister. If the blister is too large or painful, please consult a doctor.
4. On rare circumstances, it may cause nail deformity (if applied near the nail bed), disfigurement on the face (if applied on the face), or damage to nerves of the skin (if applied on elbow or fingers).

If there is continuous numbness in the wound or in its surrounding, or if there is severe ulceration, please consult a doctor.

5. Appendix (3)

Written information for patients undergoing Cryotherapy (Chinese version)- See next page

冷凍治療

1. 冷凍治療是以極低溫之液態氮氣直接噴射在患處皮膚組織上,使其凍傷受損及脫落,從而達致治療之目的。
2. 接受冷凍治療後約二十四小時,患處可能會出現小水泡或血泡。
3. 此乃凍傷治療之一般反應,請不用憂慮,患處仍可照常濕水,但需保持水泡或血泡清潔乾爽,而患處通常會於三至四星期內復原。
4. 請勿自行刺破水泡,若水泡意外弄破,只需以清潔之消毒膠布覆蓋傷口,並經常更換,以保持傷口乾爽。
5. 遇有任何疑問如水泡或血泡太大,傷口極之痛楚等,請親臨本診所向醫護人員查詢。(*注意:非辦公時間內遇有任何急需,請即前往就近之急診室求助。
6. 由於冷凍只是一治標性治療,因此需要依照醫生給予之意見,繼續覆診或再次接受治療。

5. Appendix (4)

Consent form for Cryotherapy- See next page

MAJOR CONSENT FORM FOR CRYOTHERAPY

I _____ (ID Number: _____) hereby do / do not consent to undergo the operation of cryotherapy and to the nature, purpose, risk and complication such as pain, infection, blistering, scarring, pigmentation abnormality, nerve damage and cosmetic problem have been explained to me by Dr. _____. I understand no assurance has been given to me that the operation will be performed by any particular doctor.

本人 _____ (身份證號碼: _____) 茲 同意 / 不同意進行冷凍治療手術。有關手術之性質、效果、及可能發生之危險及併發症如痛楚、發炎、水泡、疤痕、色素轉變、神經線創傷及美容問題, 已由 _____ 醫生向本人解釋清楚。本人更明白該項手術並無保證特別由某一位醫生施行。

Signature of Doctor
負責醫生簽署

Signature of Witness
見證人簽署

Name in Block letter
姓名

Name in Block letter
姓名

Signature of Patient
病人簽署

Name in Block letter
姓名

Date: _____
日期

MINOR CONSENT FORM FOR CRYOTHERAPY

I _____ (ID Number: _____) hereby do / do not give consent for _____ to undergo the operation of cryotherapy and to the nature, purpose, risk and complication such as pain, infection, blistering, scarring, pigmentation abnormality, nerve damage and cosmetic problem have been explained to me by Dr. _____. I understand no assurance has been given to me that the operation will be performed by any particular doctor.

本人 _____ (身份證號碼: _____) 茲 同意 / 不同意 _____ 進行冷凍治療手術。有關手術之性質、效果、及可能發生之危險及併發症如痛楚、發炎、水泡、疤痕、色素轉變、神經線創傷及美容問題, 已由 _____ 醫生向本人解釋清楚。本人更明白該項手術並無保證特別由某一位醫生施行。

Signature of Doctor
負責醫生簽署

Signature of Witness
見證人簽署

Name in Block letter
姓名

Name in Block letter
姓名

Signature of Patient' s parent
病人家長簽署

Name in Block letter
姓名

Date: _____
日期

6. References:

1. Esther Hughes, Julie Van Onselen. Dermatology Nursing. A practical guide. Churchill Livingstone.
2. D. Czarnecki, Igor Jkubowitz. Surgical Dermatology. Session 10, Part 3. MFM1004 dermatology module. Monash University.
3. Richard P. Usatine, Edward L Tobinick. Skin Surgery: A practical guide. Ch 11. Cryosurgical Techniques.
4. Christopher J Price, Rodney Sindair. Fast facts- Minor surgery.
5. KK Lo, LY Chong, YM Tang, KM Ho. Handbook of dermatology and venereology. Social Hygiene Handbook. 3rd edition.

Suggested reading for pictures of indicated condition:

1. John R.T. Reeves, Howard I. Maibach. Clinically dermatology illustrated- a regional approach. 3rd edition.
2. David H Frankel. Field guide to clinical dermatology.

Prepared by Dr. LAI Wing Yiu
Supported by Clinical
Audit/Guideline Group, PD&QA,
Department of Health
May 2004 (1st edition)
October 2004 (revised edition)