



Thunder Bay Regional
Health Sciences
Centre

PRE-PRINTED DIRECT ORDER

Allergies:

Place Patient Label with
Barcode Here

Guidelines for use: 1. Patient Label 2. Document all allergies 3. Physician must sign order before it is implemented 4. Send Pharmacy copy to Pharmacy

Frostbite Protocol – Emergency (ADULTS ONLY)

Orders with a ☐ must be checked by the physician prior to implementation

* Part of this protocol uses a Special Access Program drug and off-label indication (Grade 3-4). See medication precautions and contraindications.

Rapid rewarming of frostbitten parts in 1000ml of water (39 degrees C) with 30 mL of chlorhexidine gluconate 2%/isopropyl alcohol 4% (Dexidin 2™ solution) until area becomes soft and pliable to the touch (30 – 60 min). Does not apply to head and neck frostbite.

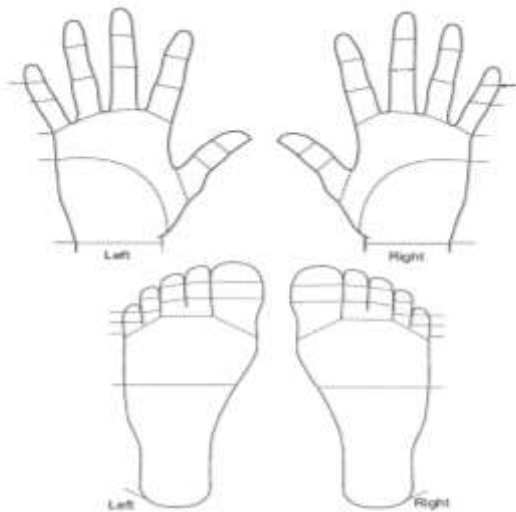


Exposure History

- Time of injury
- Conditions: temp, wind chill, wet/dry exposure, duration
- Prehospital care or rewarming



Assess for severity
(grade 1-4) after
rewarming
Complete diagram of
skin affected



Document skin changes, cyanosis, clear and hemorrhagic blisters after rewarming

* If exposure history doesn't match the assessment, reassess in 24 hours

Grading severity of frostbite after rewarming

< 24 hours since exposure

Absence of cyanosis	Cyanosis on distal phalanx	Cyanosis up to MP joint	Cyanosis proximal to MP joint
Grade 1	Grade 2	Grade 3	Grade 4
No amputation of bone	Moderate risk of amputation	High risk of amputation	Risk of amputation 100%
No blisters	Clear blisters	Hemorrhagic blisters on digits	Hemorrhagic blisters over carpal/tarsal

Date: _____ Time: _____

Physician's name: _____ Physicians signature: _____



TORDPREPRINT

PCS-DO-260
Approved: Dec-10-19 Rev: Jan-04-23, Jan-24-23
Review due by: Jan-23-25

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Patient weight _____ kg

GRADE 1-4

- ☒ Treatment of hypothermia and/or severe trauma takes priority
- ☒ Remove jewellery or other extraneous material from the body part
- ☒ Rapid re-warming of frostbite parts
- ☒ Let skin air dry, or gently pat dry, do not rub. Protect from direct trauma
- ☒ Debridement and aspiration of clear blisters, leave hemorrhagic blisters intact unless they are too large or affecting limb function. Aloe Vera and non-adherent dressing (Adaptic™, cover dressing) daily. Wrap each digit separately.
- ☒ Elevate affected parts and avoid ambulation on thawed lower extremity (unless only distal toes are affected)
- ☒ Encourage oral hydration or start warm IV ringer's lactate at _____ mL per hour
- ☒ Avoid tobacco and alcohol
- ☒ Tetanus-diphtheria (Td) adsorbed 0.5 mL intramuscular once
- ☒ Multivitamin with zinc 1 tablet oral daily
- ☒ Vitamin C 1 gm oral daily

GRADE 2 - 4

- ☒ CBC, Electrolytes, PTT, INR, Group and Screen, pregnancy test if applicable.
This part of protocol only to be used for Grade 2-4 after rewarming, deep frostbite identified as:
 - ☐ Grade 2 – Cyanosis on distal phalanx (moderate risk off amputation)
 - ☐ Grade 3 – Cyanosis up to metacarpophalangeal joint (high risk)
 - ☐ Grade 4 –Cyanosis proximal to metacarpophalangeal joint (100% risk)
- ☐ Admit to Internal Medicine _____ for inpatient management of iloprost. Consult Plastic Surgery _____ for debridement and wound management.
- ☐ Admit to Plastic surgery _____ for wound management if iloprost is not indicated.
- ☒ Immerse affected digits in hot tap water (39 degrees Celsius) once daily for 30 minutes (starting the day after re-warming), then redress with Aloe Vera, Adaptic™ and cover dressing.
- ☐ Consult Hand Occupational Therapist or Physio Therapist for range of motion, contractures, splinting, and scar management
- ☐ Consult wound care



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Frostbite Protocol – Emergency (ADULTS ONLY)

MEDICATIONS

- ☐ Ibuprofen 600 mg oral every 6 hours
- Do not give ibuprofen if Alteplase or full dose-anticoagulation has been ordered (heparin infusion, treatment dose low molecular weight heparin (LMWH), oral anticoagulants).
 - May give ibuprofen with low dose anticoagulation (DVT prophylaxis dosing of heparin or LMWH)
 - Ibuprofen is contraindicated with severe renal impairment (CrCl is less than or equal to 30 mL per min)
- ☐ Morphine 5 – 10 mg oral every 4 hours as needed for pain
- ☐ Morphine 2 - 4 mg IV every 4 hours as needed for pain
- ☐ Pantoprazole 40 mg oral once daily
- ☐ Fentanyl 12.5-25 mcg IV OR subcutaneous every 15 minutes as needed for pain (max 100 mcg per hr) for patients with a morphine allergy
- ☐ Iloprost IV infusion if patient presents within 72 hours and **if no contraindications (page 5)**
- Dilute iloprost 50 mcg (0.5 mL) in Dextrose 5% (D5W) 250 mL bag for **a final concentration of 0.2 mcg per mL**
 - Physician must be readily available for at least 10 minutes following the initiation of the infusion or dosage increase
 - **Repeat infusion daily for 5 days total**
 - Start intravenous infusion at 2 mcg per hr (10 mL per hr) and increase infusion rate by 2 mcg per hr (10 mL per hr) every 30 minutes **to a maximum of:**
 - ☐ **6 mcg per hr** (30 mL per hr) for patients 40-50 kg
 - ☐ **8 mcg per hr** (40 mL per hr) for patients 51-74 kg
 - ☐ **10 mcg per hr** (50 mL per hr) for patients 75 kg or more

Continue infusion for a maximum of 6 hours or 50 mcg (one vial) regardless of rate of administration or patient's weight

- Measure blood pressure and heart rate every 15 minutes for 2 hours then every 30 minutes for 6 hours.
- If headaches, tachycardia (heart rate greater than 100 beats per minute), palpitations, hypotension (systolic blood pressure less than 90 mmHg), nausea, vomiting or facial flushing, **decrease the infusion rate by 2 mcg per hr (10 mL per hr) and re-assess 30 minutes later** (these are dose-related side effects; usually disappear with dose reduction); If symptoms continue contact the most responsible physician and decrease the infusion rate by 2 mcg per hr (10 mL per hr) again.
- If patient tolerates infusion well on Day 1 and Day 2, may initiate at maximum infusion rate on Day 3, 4, 5
- A single dose can be beneficial, even if subsequent doses aren't possible.



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Grade 4 (if less than 24 hours since rewarming)

Within first hour of iloprost infusion, initiate:

- ☐ Alteplase intravenous INFUSION
- ☐ Give _____mg (recommended 0.15 mg per kg) intravenous over 15 minutes
- ☐ Then _____mg per hr (recommended 0.15 mg per kg per hour) intravenous for 6 hours then discontinue (Day 1 only).
- Total maximum dose (including bolus) = 100 mg

GRADE 4 (IF ALTEPLASE GIVEN)

- ☐ **HEPARIN BOLUS AND INITIAL INFUSION**
- ☐ Start heparin within 1 hour of starting Alteplase infusion per ACS Heparin Protocol (PCS-DO-209)

Physician Signature: _____ Date: _____
(yyyy/mm/dd)

Physician Name: (Print) _____ Time: _____
(hh:mm)



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*Immediate amputation should be avoided. Premature amputation increases morbidity and poor subsequent function. Surgery should be performed once demarcation of the ischemic tissue has been well defined (4-12 weeks post injury).

Iloprost contraindications

- Pregnancy, lactation
- Conditions where the effect of iloprost on platelets might increase risk of haemorrhage(e.g. active peptic ulcers, trauma, intracranial haemorrhage)
- Severe coronary heart disease or unstable angina
- Myocardial infarction within the last 6 months
- Acute or chronic congestive heart failure
- Severe arrhythmias
- Suspected pulmonary congestion

Special precautions

- Iloprost elimination is reduced in patients with hepatic dysfunction and renal failure requiring dialysis
- Monitor closely patients with low blood pressure, orthostatic hypotension, or significant heart disease
- Patients with a stroke/transient ischemic attack in the last 3 months
- Only sporadic reports of use in children and adolescents are available

Thrombolytic therapy

Absolute Contraindications	Relative Contraindications
<ul style="list-style-type: none"> • History of intracranial hemorrhage • History of ischemic stroke within prior 3 months(exception: acute ischemic stroke within 4.5 hours, treated with thrombolytic therapy) • Presence of Cerebral vascular malformation • Known primary or metastatic intracranial malignancy • Signs suggestive of aortic dissection • A bleeding diathesis or active bleeding (exception: menses) • Significant closed-head or facial trauma in prior 3 months • Intracranial or intra-spinal surgery within 2 months • Uncontrolled hypertension at presentation 	<ul style="list-style-type: none"> • History of chronic, severe, poorly controlled hypertension • Uncontrolled hypertension at presentation (Blood pressure greater than 180mmHg systolic and/or 110 mmHg diastolic) • History of ischemic stroke > 3 months prior • Dementia • Trauma or prolonged Cardiopulmonary resuscitation • Known intracranial disease that is not an absolute contraindication • Major surgery within prior 3 weeks • Internal bleeding in prior 4 weeks • Active peptic ulcer • Non compressible vascular punctures • Pregnancy • Current anticoagulant use.



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