

Cardiovascular Drugs and Therapies
NITRATES COMPARISON CHART

Generic Name	Nitroglycerin Intravenous	Nitroglycerin Patch	Nitroglycerin Ointment	Nitroglycerin Sublingual	Isosorbide Dinitrate Sublingual	Isosorbide Dinitrate	Isosorbide 5-Mononitrate
Trade Name	TRIDIL, generics	NITRODUR, TRANSDERM-NITRO, MINITRAN, TRINIPATCH	NITROL	NITROLINGUAL Pumpspray, RHO-NITRO Pumpspray, NITROLINGUAL Metered dose spray NITROSTAT sublingual tablet	generics	generics (for immediate release) SR: no longer available	IMDUR, generics
Dosage Forms	100 mg/250 mL premixed bottle - UHN Note: 0.84 mL alcohol per 100 mL solution 100 mcg/mL 200 mcg/mL 400 mcg/mL 10 mg/10 mL vial - UHN 50 mg/10 mL vial - UHN	0.2 mg/h 0.4 mg/h 0.6 mg/h 0.8 mg/h	30 g/30 inches ointment	SL spray: 0.4 mg/ dose SL tablet: 0.3 mg, 0.6 mg	SL tablet: 5mg	Immediate release tablet: 10 mg 30 mg	SR tablet: 60 mg SR *Non-formulary at UHN

Cardiovascular Drugs and Therapies
NITRATES COMPARISON CHART

Generic Name	Nitroglycerin Intravenous	Nitroglycerin Patch	Nitroglycerin Ointment	Nitroglycerin Sublingual	Isosorbide Dinitrate Sublingual	Isosorbide Dinitrate	Isosorbide 5-Mononitrate
<p>Dosing Usual dose range</p>	<p>Starting and target doses are determined by clinical situation and the number and response to initial SL boluses required for symptom control.</p> <p>For maintenance of symptom control: initial dose of 10-60 mcg/min may be titrated up every 10 min by 5-20 mcg/min increments. Titrate to a usual target dose of 60-100 mcg/min, maintaining SBP above 90 mm Hg; avoid SBP decrease of more than 30 mm Hg or HR increase of more than 10 bpm. Usual maximum dose is</p>	<p>0.2 to 0.8 mg/h once daily.</p> <p>12-14 hour patch-free interval required for stable angina.</p> <p>May use continuously for unstable patients for 48 to 72 hours.</p>	<p>½ inch to 1 inch tid-qid; remove for 8-10 hours per 24-hour period; e.g., <i>ON</i> 0600, 1200, 1800, <i>OFF</i> at 2200</p>	<p>SL spray: 0.4 mg prn; dose may be repeated after 5 minutes for total of 3 doses in 15 minutes</p> <p>SL tablet: 0.3-0.6 mg prn; dose may be repeated after 5 minutes for a total of 3 doses in 15 minutes</p>	<p>SL tablet: 5-10 mg q2-4h for prophylaxis of acute angina</p>	<p>Immediate release: 10-45 mg tid on qid schedule (e.g., 0600, 1200, 1800 at UHN standard medication administration times) for nitrate-free period</p>	<p>60-240 mg SR once daily</p>

Cardiovascular Drugs and Therapies
NITRATES COMPARISON CHART

Generic Name	Nitroglycerin Intravenous	Nitroglycerin Patch	Nitroglycerin Ointment	Nitroglycerin Sublingual	Isosorbide Dinitrate Sublingual	Isosorbide Dinitrate	Isosorbide 5-Mononitrate
	400 mcg/min.						
Comments	Dose-related hypotension, sinus bradycardia, headache, methemoglobinemia (rare with doses of 30 mcg/kg/min). Note: 0.84 mL alcohol per 100 mL solution	For prevention of angina. Contact dermatitis occurs in up to 40% of patients using transdermal patches (prevent by rotating sites of application)	For prevention of angina	For treatment of anginal attacks or prophylactically 5-10 minutes before engaging in activities which might precipitate an acute angina attack.	For prophylaxis of acute angina	For prevention of angina	For prevention of angina
CAUTION	Caution is required if the patient is hypotensive, bradycardiac (<50 bpm), tachycardic (>100 bpm), or has hypertrophic cardiomyopathy (HCM) or severe aortic stenosis						

Cardiovascular Drugs and Therapies

NITRATES COMPARISON CHART

Generic Name	Nitroglycerin Intravenous	Nitroglycerin Patch	Nitroglycerin Ointment	Nitroglycerin Sublingual	Isosorbide Dinitrate Sublingual	Isosorbide Dinitrate	Isosorbide 5-Mononitrate
Common Side Effects	<ul style="list-style-type: none"> - Headache, hypotension, tachycardia, flushing and edema. (Alcohol may worsen these side effects.) - Acetaminophen may help with nitrate headache. - Nitrates' therapeutic value may be compromised by the rapid development of nitrate tolerance during sustained therapy. - For stable angina patients, it is recommended that a "nitrate-free" period of approximately 12-14 hours daily be used while on nitrate therapy. - For patients with ongoing/unstable angina, consider continuous nitrate therapy (IV, patch) for 2-3 days until patient stabilizes. 						
Onset Duration	Onset: 1-2 min Duration: 3-5 min	Onset: 40-60 min Duration: 18-24 hours	Onset: 20-60 min Duration: 2-12 hours	Onset: Spray: 2 min Tablet: 1-3 min Duration: 30-60 min	Onset: 2-5 min Duration: 1-2 hours	(immediate release) Onset: 20-40 min Duration: 4-6 hours	Onset: 60-120 min Duration: 5-12 hours
Metabolism	Liver	Liver	Liver	Liver	Liver	Liver	Liver
Elimination	Renal: 22%	Renal: 22%	Renal: 22%	Renal: 22%	Renal: 80-90%	Renal: 80-90%	Renal: 78%
Dosage Adjustment	No adjustment guidelines in renal/hepatic dysfunction.						
Common Drug Interactions	<ul style="list-style-type: none"> - Phosphodiesterase-5 enzyme inhibitors (e.g., sildenafil, vardenafil, tadalafil) – contraindicated – may precipitate acute hypotension, myocardial infarction or death; Where nitrate administration is deemed medically necessary in a life-threatening situation, at least 24 hours should have elapsed after the last dose of sildenafil and vardenafil, and at least 48 hours after tadalafil. - IV nitroglycerin may antagonize anticoagulant effect of heparin (possibly only at high doses) – monitor - Ergot alkaloids may cause ↑ in blood pressure and ↓ antianginal effects - Alcohol and nitrates may have additive vasodilatation effects possibly resulting in hypotension - caution with this combination is advised. - Caution if the patient is hypotensive, bradycardiac (<50 bpm), tachycardic (>100 bpm), or has hypertrophic cardiomyopathy (HCM) or severe aortic stenosis - May potentiate ↓ blood pressure of antihypertensives -monitor for possible additive hypotensive effects 						

Cardiovascular Drugs and Therapies

NITRATES COMPARISON CHART

Generic Name	Nitroglycerin Intravenous	Nitroglycerin Patch	Nitroglycerin Ointment	Nitroglycerin Sublingual	Isosorbide Dinitrate Sublingual	Isosorbide Dinitrate	Isosorbide 5-Mononitrate
Unit Cost*	\$11.08 (5mg/mL 10mL vial)	\$0.66 (0.2 mg/h patch) \$0.47 (0.4 mg/h patch) \$0.47 (0.6 mg/h patch) \$1.29 (0.8 mg/h patch)	\$0.68 (30g)	\$8.46 (0.4 mg SL spray) \$0.12 (0.3 mg SL tablet) \$0.12 (0.6mg SL tablet)	\$0.062 (5 mg SL tablet)	\$0.037 (10 mg tablet) \$0.086 (30 mg tablet)	\$0.50 (60 mg SR tablet)
30 Day# Patient Cost		\$21 (0.2 mg/h patch) \$ 15 (0.4 mg/h patch) \$ 15 (0.6 mg/h patch) 42 (0.8 mg/h patch)	\$1.50 (60g)	\$9.10 (0.4 mg/spray) \$9.70 (0.3/0.6 mg SL)	\$2.00	\$3.60 (10 mg tid) \$8.40 (30 mg tid)	16.2 (60 mg SR daily)
ODB	N/A	Yes 0.4 mg and 0.6 mg patch (0.2 mg, 0.8 mg NOT covered)	Yes	Yes Available also as non-prescription products	Yes	Yes (immediate release tablets)	No
MSH	Yes	Yes	Yes	Yes	No	Yes (immediate release tablets)	Yes
UHN	Yes 100 mg/250 mL 10 mg/10mL 50 mg/10mL	Yes	Yes	Yes	Yes	Yes (immediate release tablets)	No

* List prices from the Ontario Drug Benefit (ODB) Formulary, Ontario Ministry of Health. Last Updated: 01/04/2011 Version 2.2. All prices represent the generic medication option. IV prices from distributor database.

30 day patient costs represented by ODB generic price + 8% markup. These prices do not include a dispensing fee, which can range from 4.99 – 11.99. Pricing is based on a typical dosing regimen.

Cardiovascular Drugs and Therapies

NITRATES COMPARISON CHART

Approximate equivalent dosages of nitrates

- | | |
|--------------------------|--------------|
| - Nitroglycerin ointment | - 1 inch q6h |
| - Nitroglycerin Patch | - 0.4 mg/h |
| - Isosorbide Dinitrate | - 15 mg tid |
| - Isosorbide Mononitrate | |
| - Immediate release | - 10 mg bid |
| - Sustained release | - 30 mg/day |

REFERENCES

1. Parker JD, Parker JO. Nitrate therapy for stable angina pectoris. *New Eng J Med.* 1998;338:520-531.
2. Anderson PO, Knoben JE, Troutman WG, eds. *Handbook of clinical drug data*, 9th edition. Stamford (CT): Appleton and Lange, 1999.
3. Parker JO, Parker JD. Angina pectoris. In: Gray J, ed. *Therapeutic Choices*, 2nd edition. Ottawa (ON): Canadian Pharmacists Association, 1998:172-83.
4. Talbert RL. Ischemic heart disease. In: Dippiro JT, et al, eds. *Pharmacotherapy: A pathophysiologic approach*, 4th edition. Stamford, Connecticut: Appleton and Lange; 1999:182-210.
5. University Health Network Nursing Intravenous Drug List, Revised August, 1997.
6. Ontario Drug Benefit Formulary. Available at http://www.health.gov.on.ca/english/providers/program/drugs/odbf_eformulary.html; accessed 2010 March 10.
7. *Lexi-Comp's Drug Information Handbook*, 13th Edition. Lacy CF, Armstrong LL, Goldman MP, et al (eds). Hudson (OH): Lexi-Comp, Inc., 2005.
8. *Compendium of Pharmaceuticals and Specialties*, online version (e-CPS), 2010.
9. MICROMEDEX® 1.0 (Healthcare Series), 2010.
10. Anderson JL, Adams CD, Antman EM, et al. ACC/AHA 2007 guidelines for the management of patients with unstable angina/nonST-elevation myocardial infarction—Executive Summary: A Report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines. *JACC.* 2007;50(7):678.
11. University Health Network. *Management of ST Elevation Acute Coronary Syndromes Guidelines*, 2006.

Prepared by: Debbie Chong, BScPhm - June 2000

Reviewed by: Cynthia Jackevicius, BScPhm, MSc - June 2000;

Jenny Chiu, BScPhm - December 2000

Updated by: Joyce Chan, BScPhm - March 2010, March 2011

Reviewed by: John Janevski, MD - June 2011

Reviewed by: Kori Leblanc, BScPhm, PharmD - February 2012

Updated by: Caitlin Meyer, BScPhm, ACPR - January 2015

Cardiovascular Drugs and Therapies

NITRATES COMPARISON CHART

Terms and Conditions

Copyright © University Health Network, 2014. All rights reserved.

The contents of this Handbook are approved and endorsed by the UHN Cardiovascular Subcommittee of the Pharmacy and Therapeutics Committee.

1. Purpose of the Pharmacotherapy Handbook.

Notice to Healthcare Providers:

The Pharmacotherapy Handbook is intended to be used as a tool to aid in the appropriate prescribing and administration of cardiovascular formulary agents.

This information in this Handbook is intended for use by and with experienced physicians and pharmacists. The information is not intended to replace sound professional judgment in individual situations, and should be used in conjunction with other reliable sources of information. Decisions about particular medical treatments should always be made in consultation with a qualified medical practitioner knowledgeable about Cardiovascular illness and the treatments in question.

Due to the rapidly changing nature of cardiovascular treatments and therapies, users are advised to recheck the information contained herein with the original source before applying it to patient care.

Notice to non-Healthcare Providers:

Not Medical Advice. The information contained in the Handbook is not a substitute for professional medical advice, diagnosis or treatment. Never make changes to your medication, nor adjust your dose, without first consulting your health care provider. Always seek the advice of a physician or other qualified healthcare provider concerning questions you have regarding a medical condition, and before starting, stopping or modifying any treatment or medication. Never delay obtaining medical advice or disregard medical advice because of something you have or have not read in the Handbook. If you have, or suspect you have, a health problem, or if you experience an adverse side effect, please consult your doctor. If you have, or suspect you are experiencing a health emergency, please call 911 and/or promptly visit a Hospital Emergency Department in your area.

2. **DISCLAIMER: UNIVERSITY HEALTH NETWORK MAKES NO WARRANTIES OR REPRESENTATIONS AS TO THE ACCURACY OF THE INFORMATION PROVIDED. THE INFORMATION CONTAINED IN OR PRESENTED IN THIS HANDBOOK COMES WITHOUT ANY REPRESENTATION OR WARRANTY OF ANY KIND, EXPRESSED OR IMPLIED. ANY IMPLIED WARRANTY OR CONDITION OF FITNESS FOR A PARTICULAR PURPOSE, MERCHANTABILITY OR OTHERWISE, INCLUDING BUT NOT LIMITED TO WARRANTIES OF NON-INFRINGEMENT OF THIRD PARTY RIGHTS, AND FREEDOM FROM COMPUTER VIRUSES, IN RESPECT OF THE HANDBOOK IS EXPRESSLY DISCLAIMED.**

3. **Disclaimer.** Neither UHN, as an entity, nor any of its staff or contractors can under any circumstance be held liable for consequences caused by or deriving from the use of the Handbook or any information contained in the Handbook. UHN is not liable for damages arising from use of the Handbook, or from third party websites (via hyperlinks) to which references are made in the Handbook. In no event shall UHN be liable for direct, indirect, consequential, special, exemplary, or other damages related to your use of the Handbook, regardless of how arising or the theory of liability whether arising in contract, tort, negligence or otherwise.

Your use of third-party websites is at your own risk and subject to the terms and conditions of use for such sites, including but not limited to the terms and conditions of <http://pie.med.utoronto.ca/> on which this Handbook is housed.

4. **Governing Law and Jurisdiction.** Any action or claim arising from or related to your use of the Handbook shall be brought in the courts of, and governed exclusively by, the laws of Ontario, Canada and the applicable laws of Canada applicable therein, without regard to its conflicts of laws principles. Unless prohibited by applicable law, you expressly waive the right to participate in a class action proceeding.

Your comments on the usefulness of the resources contained in the Handbook are welcomed and may be forwarded to Amita Woods, Department of Pharmacy Services (amita.woods@uhn.ca).