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# The Use of Phenylephrine for Management of Priapism

## Introduction

1. The American Urological Association (AUA) defines priapism as a persistent penile erection lasting at least four hours related or non-related to sexual stimulation.
2. Priapism is a medical emergency that is rare, unpredictable and can occur in all age groups especially in patients with sickle cell disease.
3. A sympathomimetic medication such as phenylephrine is administered as an intracavernous injection if aspiration with or without irrigation fails following the diagnosis of Ischemic priapism.
4. The AUA priapism guideline panel recommends the use of phenylephrine because it is a pure alpha-adrenergic agonist with minimal cardiovascular side effects compared to the other sympathomimetic agents.
5. Of note, the AUA priapism guideline panel states that oral systemic therapy has no indication for treating ischemic priapism.

## Pharmacology

| | **Phenylephrine** |
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| **Dose** | 100mcg to 500mcg every 3 to 5minutes over the course of 1 hour. |
| **Administration** | Dilute phenylephrine with normal saline to a concentration of 100 to 500mcg/mL. Administer 1mL of the diluted solution as an intracavernous injection every 3 to 5minutes until resolution or up until one hour before deciding whether the treatment is successful or not.<br>*Lower concentration and smaller volumes are appropriate for use in children and those with severe cardiovascular disease. |
| **PK/PD** | No PK/PD available for this off-label route and use intracavernously.<br>**Onset:** IV Immediate, IM, SubQ 10 – 15minutes<br>**Duration:** BP increase/vasoconstriction: IV 15-20minutes, IM 1-2 hours, SubQ: 50 minutes<br>**Metabolism:** Hepatic<br>**Half-life:** Alpha phase: 5minutes, Terminal phase: 2 – 3 hours.<br>**Excretion:** Urine (mostly as inactive metabolites) |
| **Adverse Effects** | Acute hypertension, headache, reflex bradycardia, tachycardia, palpitations and cardiac arrhythmia. |
| **Drug Interactions and warnings** | Blood pressure and ECG monitoring is recommended for patients with high cardiovascular risk. |
| **Compatibility** | NS |

## Overview of Evidence

| Author, year | Design/ sample size | Intervention & Comparison | Outcome |
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| **Dittrich** 1991 | Restrospective review (n=36) | 36 patients with different etiology of priapism with duration of up to 14hours received phenylephrine at a dose of 200mcg to | • Detumescence was obtained after 2 or 3 minutes of phenylephrine administration in 35 patients. |

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| | | 500mcg. Patients with symptom lasting longer than 5hours received 500mcg of phenylephrine. | • One patient with priapism lasting for 14hours achieved detumescence after 30minutes of receiving 500mcg of phenylephrine.<br>• All 36 patients responded successfully to intracavernous injection of phenylephrine with no marked side effect. |
| **Wen 2006** | Case report (n=2) | 39-year-old male with a 36-hour history of trazodone-induced priapism. Patient failed management with intracavernosal phenylephrine (300mcg every 5–10 minutes up to a maximal dose of 1.5 mg). As an inpatient, dose increased to 1000mcg every 5 – 10 minutes. Clinical improvement seen however 75% penile rigidity persisted. As a result, dose was changed to 700mcg/hour for a total dose of 40000mcg of phenylephrine.<br><br>34-year-old male with 48-hour idiopathic ischemic priapism received 1000mcg every 5 minutes for a total dose of 15,000 mcg after failing low dose phenylephrine. Due to persistent 80% penile erection, dose was changed to 1,000mcg/hour until permanent penile detumescence was achieved. | • Patient was discharged 24hours after permanent penile detumescence was achieved. Blood pressure and heart rate monitoring showed no episodes of bradycardia and hypertension. Patient reported to have normal erectile function.<br><br>• Complete penile detumescence was achieved after 2 days of intracavernosal self-injection with high-dose phenylephrine (total cumulative dose estimated of 50,000mcg). No adverse events were reported. Upon physical examination, patient was potent with normal erectile tissue. |
| Martin **2016** | Retrospective review (n = 31) | 23 received intracavernous phenylephrine at a mean dose of 138 ± 85mcg.<br><br>Eight received terbutaline. Seven received a single subcutaneous injection at a mean dose of 383 ± 129mcg and one patient receive 5mg orally | • Successful detumescence with initial treatment was statistically greater with phenylephrine compared with terbutaline [74% vs 25%]; risk ratio, 0.34; 95% confidence interval, 0.099-1.15; P = 0.03)<br>• Six patients encountered treatment failures with terbutaline. 4 (67%) had successful detumescence with phenylephrine, and 2 (33%) required surgical intervention.<br>• Six patients who encountered treatment failure with phenylephrine underwent surgical intervention.<br>• No adverse drug related events were reported in the medical record. |
| **Ridyard 2016** | Retrospective review (n=58) | 38 (65%) patients received phenylephrine alone at a dose of 200mcg – 1000mcg (median total dose of 1500mcg range of 300mcg – 12000mcg)<br>12 (21%) patients received phenylephrine and irrigation<br>8 (14%) patients failed non-surgical management and needed surgery | • Patients who presented within 36hours of symptom onset were successfully treated with non-surgical management vs those that presented after 36hours.<br>• Lower dose of Phenylephrine achieved detumescence in patients that presented within 12hours of symptom onset vs those that presented after 12hours (1400mcg vs 3500mcg P < 0.05).<br>• Changes in heart rate and diastolic blood pressure were significant from admission to discharge (95% CI = 3.3 – 10.7) and (95% CI = 6.2 -15) however no change in systolic blood pressure was found. |
| **Sidhu 2018** | Retrospective chart review (n=58) | 58 patients received phenylephrine administered in 500mcg/mL doses every 3 to 5 minutes. Median dose administered was 1000mcg with interquartile range of 500-2000mcg. | • 53 of 58 (91%) of patients who received PE experienced detumescence at the bedside. |

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| | | | • Of the 5 patients who did not achieve detumescence, 2 patients underwent distal shunt procedures in the OR, and 3 patients left against medical advice (AMA).<br>• Of note, the two patients who underwent surgical interventions presented much later (36 and 56 hours) vs 8.5hours for the 53 remaining patients.<br>• Although changes in vital signs were seen univariate linear regression found no significant association between PE dose and change in HR or BP<br>• No adverse events occurred. |

**Conclusions:**

1. Low dose Phenylephrine (200mcg) can achieve detumescence in patients presenting with shorter duration of symptom onset.
2. The longer the duration of priapism, the higher the dose needed to achieve detumescence and the need for surgical intervention in some cases.
3. Phenylephrine is superior to terbutaline at achieving detumescence
4. Although changes in vitals were sometimes observed during administration of phenylephrine intracavernously, no adverse events were reported.
5. The AUA recommends blood pressure and electrocardiogram monitoring when administering phenylephrine in patients with high cardiovascular risk.

**References**


1. Uptodate [Electronic version]. Retrieved February 15, 2021, from http://www.uptodate.com/
2. Montague DK, Jarow J, Broderick GA et al: American Urological Association guideline on the management of priapism. J Urol 2003; 170: 1318.
3. Dittrich A, Albrecht K, Bar-Moshe O, Vandendris M. Treatment of pharmacological priapism with phenylephrine. *J Urol*. 1991; 146(2):323-324.
4. Wen CC, Munarriz R, McAuley I, Goldstein I, Traish A, Kim N. Management of ischemic priapism with high-dose intracavernosal phenylephrine: from bench to bedside [published correction appears in J Sex Med. 2006 Sep;3(5):938]. *J Sex Med*. 2006; 3(5):918-922.
5. Martin C, Cocchio C. Effect of phenylephrine and terbutaline on ischemic priapism: a retrospective review. *Am J Emerg Med*. 2016; 34(2):222-224.
6. Ridyard DG, Phillips EA, Vincent W, Munarriz R. Use of High-Dose Phenylephrine in the Treatment of Ischemic Priapism: Five-Year Experience at a Single Institution. *J Sex Med*. 2016; 13(11):1704-1707.
7. Sidhu AS, Wayne GF, Kim BJ, Anderson AGS, Cordon BH, Caso JR, Polackwich AS. The Hemodynamic Effects of Intracavernosal Phenylephrine for the Treatment of Ischemic Priapism. J Sex Med. 2018 Jul;15(7):990-996