

Drugs help pass more ureteral stones, <i>J Fam Pract</i> 2008; 57:224-227.	
Potential PURL Review Form: Systematic reviews and meta-analyses	
SECTION 1: IDENTIFYING INFORMATION	
1.0 Citation	Singh A, Alter HJ, Littlepage A. A systematic review of medical therapy to facilitate passage of ureteral calculi. <i>Ann Emerg Med.</i> 2007; 50:552-563.
1.1 Editors classification of nominated study	Potential PURL <ul style="list-style-type: none"> • Assign Potential PURL Reviewer • Schedule Potential PURL Review date
1.2 Editors reason for classification	This systematic review suggests that "medical expulsive therapy," using either alpha-antagonists or calcium channel blockers, augments the stone expulsion rate compared to standard therapy for moderately sized distal ureteral stones. We are not certain if this is consistent with current practice but think not.
1.4 Hypertext link to PDF of full article (Managing Editor)	http://www.ncbi.nlm.nih.gov/entrez/utils/fref.fcgi?PrId=3048&itool=AbstractPlus-def&uid=17681643&db=pubmed&url=http://linkinghub.elsevier.com/retrieve/pii/S0196-0644(07)00612-9
1.5 First date published study available to readers	08/07
1.6 PubMed ID	17681643
1.7 Nominated By	Jim Stevermer
1.8 Institutional Affiliation of Nominator	University of Missouri
1.9 Date Nominated	01/17/08
1.10 Identified Through	Annals of Emergency Medicine
1.11 PURLS Editor	Bernard Ewigman
1.12 Nomination Decision Date	01/24/08
1.13 Potential PURL Review Form (PPRF) type	PPRF Systematic Reviews/Meta-Analyses
1.14 Other comments, materials or discussion	
1.15 Assigned Potential PURL Reviewer	Sarah-Anne Schumann
1.16 Reviewer Affiliation	University of Chicago
1.17 Date Review Due	01/31/08

1.18 Abstract

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STUDY OBJECTIVE: Acute renal colic is a common presenting complaint to the emergency department. Recently, medical expulsive therapy using alpha-antagonists or calcium channel blockers has been shown to augment stone passage rates of moderately sized, distal, ureteral stones. Herein is a systematic evaluation of the use of medical expulsive therapy to facilitate ureteral stone expulsion. **METHODS:** We searched the databases of MEDLINE, EMBASE, and the Cochrane Controlled Trials Register. Additional sources included key urologic journals and bibliographies of selected articles. We included studies that incorporated a randomized or controlled clinical trial design, patients older than 18 years, treatment in which an alpha-antagonist or calcium channel blocker was compared to a standard therapy group, and studies that reported stone expulsion rates. A random effects model was used to obtain summary risk ratios (RRs) and 95% confidence intervals (CIs) for stone expulsion rate. **RESULTS:** A pooled analysis of 16 studies using an alpha-antagonist and 9 studies using a calcium channel blocker suggested that the addition of these agents compared to standard therapy significantly improved spontaneous stone expulsion (alpha-antagonist RR 1.59; 95% CI 1.44 to 1.75; number needed to treat 3.3 [95% CI 2.1 to 4.5]; calcium channel blocker RR 1.50; 95% CI 1.34 to 1.68; number needed to treat 3.9 [95% CI 3.2 to 4.6]) in patients with distal ureteral stones. Subgroup analysis of trials using concomitant medications (ie, low-dose steroids, antibiotics, and elimination of trials using an anticholinergic agent) yielded a similar improvement in stone expulsion rate. Adverse effects were noted in 4% of patients receiving alpha-antagonist and in 15.2% of patients receiving calcium channel blockers. **CONCLUSION:** Our results suggest that "medical expulsive therapy," using either alpha-antagonists or calcium channel blockers, augments the stone expulsion rate compared to standard therapy for moderately sized distal ureteral stones.

PMID: 17681643 [PubMed - indexed for MEDLINE]

<p>2.1 What types of studies are included in this review?</p>	<p>22 RCT (13 alpha antagonist-mostly tamsulosin), 6 calcium channel blocker (nifedipine in all), 3 both)</p>
<p>2.2 What is the key question addressed by this review? Summarize the main conclusions and any strengths or weaknesses.</p>	<p>How effective are alpha-antagonists (aa) and calcium channel blockers (ccb) in improving the stone expulsion rate and time to stone passage in adults with distal ureteral calculi? For aa, spontaneous stone expulsion (vs standard therapy=pain meds, usu NSAIDs and >2L fluid intake daily) RR 1.59 (95% CI 1.44-1.75), NNT 3.3 (2.1-4.5); reduction in 2-6 days Ccb: RR 1.50 (1.34-1.68) NNT 3.9 (3.2-4.6)</p> <p>Some studies included other meds-low-dose steroids, anticholinergics, antibiotics, etc. in both groups, although 3 included steroids and antibiotic or gastroprotective agent in treatment group only; 3 used aescin (horse chestnut seed extract) as adjunct med; in 5 trials, standard therapy group got anticholinergic; publication bias in aa studies but not ccb studies, some heterogeneity in aa but not ccb trials; poor quality studies-many not double-blinded, very small, publication bias in aa trials</p> <p>Includes 8 more studies than previous meta-analysis</p>
<p>SECTION 3: INTERNAL VALIDITY</p>	
<p>3.1 Study addresses an appropriate and clearly focused question</p>	<p>Well addressed</p>
<p>3.2 A description of the methodology used is included.</p>	<p>Well addressed</p>
<p>3.3 The literature search is sufficiently rigorous to identify all the relevant studies.</p>	<p>Well addressed</p>
<p>3.4 Study quality is assessed and taken into account.</p>	<p>Well addressed</p>
<p>3.5 There are enough similarities between selected studies to make</p>	<p>Adequately addressed</p>

combining them reasonable.	
3.6 Are patient oriented outcomes included? If yes, what are they?	Proportion of patients who pass stone without surgical intervention; time to stone passage
3.7 Is funding a potential source of bias? If yes, what measures (if any) were taken to insure scientific integrity?	No
SECTION 4: EXTERNAL VALIDITY	
4.1 To which patients might the findings apply? Include patients in the meta-analysis and other patients to whom the findings may be generalized.	Adults with distal ureteral calculi
4.2 In what care settings might the findings apply, or not apply?	ER, primary care, urology
4.3 To which clinicians or policy makers might the findings be relevant?	As above
SECTION 5: REVIEW OF SECONDARY LITERATURE	
5.1 DynaMed excerpts	<ul style="list-style-type: none"> DynaMed makes note of the research showing the effectiveness of these drugs for facilitating the passage of ureteral stones.
5.2 DynaMed citation/access date	"nephrolithiasis" updated 1.25.08, accessed 1.30.08
5.3 UpToDate excerpts	UpToDate recommends using tamsulosin for four to six weeks for ureteral stones equal to or less than 10 mm in diameter and urology referral if spontaneous passage does not occur or if the patient has significant discomfort.
5.4 UpToDate citation/access date	<p style="text-align: center;">Diagnosis and acute management of suspected nephrolithiasis in adults</p> <p>Gary C Curhan, MD, ScD Mark D Aronson, MD Glenn M Preminger, MD</p> <p><i>this topic was last changed on April 3, 2007</i></p>

5.5 PEPID PCP excerpts

Therapeutics

1. Acute Treatment

- Pain control
 - Oral NSAIDs/ [ibuprofen](#): 600-800 mg tid
 - [Indomethacin](#) 50 mg qid
 - [Ketorolac](#) 30-60 mg IV/IM
 - IV [meperidine](#): 50-100 mg, or [morphine](#) 10-15 mg every 3-4 hours
- Hydration:
 - Increase urine output to 2 L/day
- Strain urine for stone
- Consider urologic consultation in or outpatient if:
 - Severe pain unresponsive to medication
 - Persistent fever or nausea
 - Significant impediment of urine flow
 - No movement of stone

2. Surgical intervention possibilities

- Ureteroscopic stone extraction
- Extracorporeal shock wave lithotripsy
- Cystoscopy with basket extraction or laser lithotripsy
- Nephrolithotomy or nephrostomy for drainage
- American Urological Association Recommendations
 - Proximal ureteral stones <1 cm in diameter: ESWL, percutaneous nephroureterolithotomy and ureteroscopy
 - Distal ureteral stones <1 cm in diameter: Most pass spontaneously, ESWL and ureteroscopy are accepted therapies
 - Distal ureteral stones >1 cm in diameter: watchful waiting, ESWL, ureteroscopy (following stone fragmentation)

3. Possible complications

- ESWL:
 - Skin bruising
 - Perinephric hematoma
 - Hematuria
 - Hypertension
- Untreated stones:
 - Hydronephrosis
 - Infection/sepsis
 - Renal impairment

Follow-Up

1. Return to office:

- If signs of infection develop
- Repeat KUB or ultrasound 1-2 weeks

	<p>2. Refer to specialist:</p> <ul style="list-style-type: none"> ○ Refer to urology in complicated or recurrent urolithiasis as above <p>3. Admission to hospital:</p> <ul style="list-style-type: none"> ○ Persistent vomiting ○ Suspected UTI ○ Pain unresponsive to oral analgesics ○ Calculus >6mm (less likely spontaneous passage) ○ Non-functioning kidney, horseshoe kidney or urine extravasation
<p>5.6 PEPID citation/access data</p>	<p>“Nephrolithiasis” accessed 1.30.08</p>
<p>5.7 Other excerpts (USPSTF; other guidelines; etc.)</p>	
<p>5.8 Citations for other excerpts</p>	
<p>SECTION 6: CONCLUSIONS</p>	
<p>6.1 How well does the meta-analysis minimize sources of internal bias and maximize internal validity? Give one number on a scale of 1 to 7 (1=extremely well; 4=neutral; 7=extremely poorly)</p>	<p>2</p>
<p>6.2 If 6.1 was coded as 4 or below, please describe the potential bias and how it could affect the study results. Specifically, what is the likely direction in which potential sources of internal bias might affect the results?</p>	
<p>6.3 Are the results of this review relevant to the health care needs of patients cared for by “full scope” family physicians, general internists, general pediatricians, or general ob/gyns? Are they applicable without significant change in programs or policies such as the organization or financing of practice? Give one number of a scale of 1 to 7 (1=absolutely relevant;</p>	<p>1</p>

4=neutral; 7=not at all relevant)	
6.4 Please explain your response to item 6.3.	Definitely relevant to generalists
6.5 What is the main recommendation for change in practice, if any? Include a description of the change in practice, the indication(s), and the target population.	This does not appear to be a change in practice as 2/3 databases include this information already based on prior meta-analyses
SECTION 7: EDITORIAL DECISIONS	
7.1 FPIN PURLs editorial decision	PURL
7.2 FPIN PURLS Editor	John Hickner
7.3 Date of decision	January 31, 2008
7.4 Brief summary of decision	Medical treatment of ureteral calculi is an important patient oriented advance because it can reduce the time to stone passage and can reduce the rate of surgical intervention, decreasing patient cost, inconvenience, and discomfort. Data from UHC and NAMCS show that this practice is gaining acceptance, but is still low.
7.5 Recommendations for PEPID PCP: Topics effected. Key information to be included in PEPID PCP if this is an Important Reference or a PURL.	Medical interventions, including alpha agonists and the calcium channel blocker nifedipine, are effective in reducing the time to stone passage and the rate of surgical intervention for ureteral calculi.
7.6 JFP Interest in Publication	Accepted for publication as a PURL.