

Univesità degli Studi Di Padova

Scuola di Specializzazione in Pediatria
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Evidence-based Case Report
Lo strano dolore al fianco di Angela

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Scenario Clinico (1)

- Alle 15.00 dell'8.05 u.s. arriva in PS pediatrico Angela, una bambina di 11 anni per dolore al fianco sinistro insorto da circa 1 settimana in seguito a caduta accidentale da una sedia.
- Dalla sera precedente ingravescenza del dolore, fino ad allora saltuario, e comparsa di numerosi episodi (oltre 10) di vomito alimentare.
- Assenza di febbre e di alterazioni dell'alvo.

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Scenario Clinico (2)

- Angela è una bambina di origine indiana, adottata nel 1999
- Anamnesi familiare non nota
- Anamnesi fisiologica silente
- All'anamnesi patologica remota progressiva IRA da causa sconosciuta nella prima infanzia e saltuari episodi di dolore addominale al fianco sinistro scatenato dall'attività sportiva (ad es. tuffi, equitazione), talora associati ad ematuria

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Scenario Clinico (3)

ALL'ESAME OBIETTIVO

- Condizioni generali buone, ma aspetto sofferente
- PC 26.5 Kg. TC 36.8 °C. FC 82/min, PAO 98/61 mmHg
- Cute e mucose rosee, idratate
- Esame cardio-toracico nella norma
- Addome piano, trattabile, dolente alla palpazione profonda in ipocondrio e fianco sx, non organomegalia, peristalsi presente. Blumberg negativo, Giordano positivo a sx
- Restante obiettività regolare

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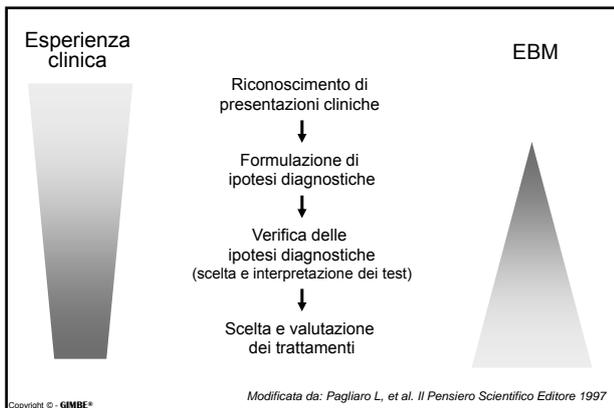
CLINICAL QUESTIONS

?

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- A. Quale ritieni l'ipotesi diagnostica più probabile?
1. Trauma splenico
 2. Colica renale
 3. Occlusione intestinale
 4. Torsione ovarica
 5. Gastroenterite

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Quale futuro per il ragionamento diagnostico?

N Engl J Med
23 Nov 2006

BMJ
2 Dic 2006

Medical Education
Educational Strategies to Promote Clinical Diagnostic Reasoning
Judith L. Bowen, M.D.

Googling for a diagnosis—use of Google as a diagnostic aid: internet based study
Hongqi Tang, Jennifer Hesse, Ewoson Ng

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	RULE IN	RULE OUT
Trauma splenico	Storia di trauma	Non organomegalia
Colica renale		
Occlusione intestinale		
Gastroenterite		
Torsione ovarica		

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Scenario Clinico (4)

In PS vengono eseguiti:

Stick urine

- pH 6, PS 1020, GR 3+, Prot +/-

Esami ematochimici

- Emocromo, VES, PCR e funzionalità renale nella norma

Viene mantenuto in sede accesso venoso per idratazione e.v

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	RULE IN	RULE OUT
Trauma splenico	Storia di trauma	Ematuria Non organomegalia
Colica renale		
Occlusione intestinale		
Gastroenterite		
Torsione ovarica		

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CLINICAL QUESTIONS ?

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- B. Quale test di imaging avresti richiesto?
1. Rx diretta addome
 2. TAC addome
 3. Ecografia addome
 4. Urografia discendente
 5. Ecografia addome + Rx diretta addome

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Diagnosi. Il tallone d'Achille dell'EBM

- La metodologia della **ricerca primaria** sull'accuratezza dei test diagnostici, è ancora "immatura".
- La metodologia di conduzione delle **revisioni sistematiche** in ambito diagnostico non ha raggiunto standard ottimali.
- Le raccomandazioni cliniche delle **linee guida** spesso si affidano a metodi di consenso formale

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Date of origin: 1999
Last review date: 2006

ACR
American College of Radiology
ACR Appropriateness Criteria®

Clinical Condition: Hematuria—Child
Variant 2: Painful hematuria (non-traumatic).

Radiologic Procedure	Rating	Comments	RRL*
CT abdomen and pelvis with contrast	8	Without contrast to evaluate for stones.	High
US kidneys and bladder	7		None
X-ray abdomen and pelvis	6		Min
X-ray intravenous urography	2		Low
INV voiding cystourethrography	2		IP
MRI abdomen and pelvis	2		None
INV angiography abdomen kidneys	2		IP

Rating Scale: 1=Least appropriate, 9=Most appropriate

* Relative Radiation Level

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Guidelines on Urolithiasis

H.-G. Tiselius, D. Ackermann, P. Alken, C. Buck,
P. Conort, M. Gallucci, T. Knoll



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Table 5: Imaging modalities in the diagnostic work-up of patients with acute flank pain

Examination	GR and/or LE	References	Comment
KUB + US	B/2a	6	3.1
Excretory urography	Standard		3.1
Unenhanced helical CT	A/1	1-10	3.1

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3. DIAGNOSTIC PROCEDURES

3.1 Diagnostic imaging

The diagnostic work up of all patients with symptoms of urinary tract stones requires a reliable imaging technique (Table 5). In case of an acute stone colic, excretory urography (intravenous pyelography (IVP)) has been established as a gold standard. During recent years, unenhanced helical computed tomography (CT) examinations have been introduced as a quick and contrast-free alternative (1,2,3). In randomized prospective studies, the specificity and sensitivity of this method for patients with acute flank pain was found to be similar to that obtained with urography (4,5-9). In selected cases, additional information regarding renal function may be obtained by combining CT with contrast infusion. One great advantage of CT is the demonstration of uric acid and xanthine stones, which are radiolucent on plain films. Another advantage is the ability of CT to detect alternative diagnoses (7,10). However, the advantage of a non-contrast imaging modality has to be balanced against the higher radiation dose given to the patient during CT investigation (3,5,11).

An alternative and commonly applied method for evaluating patients with acute flank pain is a plain film of kidneys, ureters and bladder (KUB) combined with ultrasonography (US). There is a huge bulk of experience to show that these two methods are sufficient in a large proportion of patients for the diagnosis of a ureterial stone.

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Eur Radiol (2005) 15:2515-2520
DOI 10.1007/s00300-005-1957-1

UROGENITAL

S. A. Pfister
A. Deckert
S. Laschke
S. Dellas
U. Otto
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W. Wiesner
G. Bangartz
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Unenhanced helical computed tomography vs intravenous urography in patients with acute flank pain: accuracy and economic impact in a randomized prospective trial

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CRITICAL APPRAISAL

QUESTION

- La UHCT (unenhanced helical computed tomography) è più accurata della IVU (intravenous urography) nella diagnosi di urolitiasi acuta in pazienti con dolore acuto al fianco?

STUDY DESIGN

- Studio controllato e randomizzato

SETTING

- University Hospital Basel Emergency Department, nel periodo tra novembre 1998 e marzo 2000

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CRITICAL APPRAISAL

PATIENTS

- 122 pz consecutivi affetti da dolore acuto al fianco con sospetta colica renale

INTERVENTION

- UHCT previa randomizzazione dei pz con sospetta colica renale che abbiano eseguito
 - Esami ematologici e urinari
 - Rx addome
 - Ecografia addominale

COMPARISON

- IVU

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CRITICAL APPRAISAL

MAIN OUTCOME MEASURES

- Accuratezza diagnostica di UHCT e IVU nella diagnosi di urolitiasi acuta.
- Impatto economico
- Dose di radiazioni
- Tempo richiesto per la diagnosi

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CRITICAL APPRAISAL

MAIN RESULTS

	UHCT	IVU	osservazioni
Sensibilità	85%	75%	informazioni indirette?
Specificità	98%	91%	
Costo	310 €	309 €	costi indiretti?
Tempo esecuzione	23'	81'	tempo arrivo-esecuzione esame?
Dose radiazioni	6,5 mSv	3,3 mSv	
Eventi avversi		3 reazioni al mc	

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CRITICAL APPRAISAL: bottom line

In pz con sospetta colica renale, **UHCT** può sostituire IVU come gold-standard diagnostico, ma, per l'elevato costo ed il rischio di radiazioni, la strategia diagnostica preferibile è la combinazione US + Rx

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CRITICAL APPRAISAL

VALIDITA' INTERNA

- L'assegnazione dei pz era randomizzata (non specificata la modalità di randomizzazione)
- Non è possibile mantenere la cecità
- Il follow-up è sufficientemente lungo e completo

RILEVANZA CLINICA

- Gli outcomes considerati sono importanti
- I risultati non modificano l'atteggiamento diagnostico

APPLICABILITA'

- La popolazione considerata include soggetti di età ≥17 anni

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Scenario Clinico (5)

Eco-addome

- Rene destro regolare per morfologia, dimensioni ed ecostruttura.
- Rene sinistro con regolare parenchima e presenza di ureteroidronefrosi: il diametro AP del bacinetto risulta di 16 mm ed il calibro dell'uretere di 10 mm.
- In prossimità dello sbocco dell'uretere in vescica si apprezza formazione litiasica intraluminale del diametro di 10 mm".

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Scenario Clinico (6)

- Viene iniziata terapia medica, senza richiedere alcuna consulenza chirurgica

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CLINICAL QUESTIONS

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C. Cosa avresti prescritto ad Angela per il controllo del dolore?

1. FANS
2. Morfina
3. Paracetamolo
4. Antispastico
5. FANS + antispastico

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BMJ Clinical Evidence

Kidney stones

Search date April 2006
Robyn Webber, David Tolley, James Lingeman

MANAGING ACUTE PAIN

Likely to be beneficial

NSAIDs (indomethacin and diclofenac) *New* 11

Opioid analgesics* *New* 12

Unknown effectiveness

Fluids (intravenous or oral) *New* 12

Unlikely to be beneficial

Antispasmodic drugs 12

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QUESTION What are the effects of interventions for the management of acute renal colic?

OPTION NSAIDS *New*

Pain
Compared with placebo Indometacin suppositories may reduce the need for additional pain relief compared with placebo (low-quality evidence).

Recurrence of renal colic
Compared with placebo Diclofenac may reduce the rate of recurrence of renal colic compared with placebo (low quality evidence).

Adverse effects
NSAIDs (particularly when taken orally) are well known to have gastrointestinal adverse effects, which can be severe.

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QUESTION What are the effects of interventions for the management of acute renal colic?

OPTION ANTISPASMODIC AGENTS

Pain
Compared with placebo Antispasmodic drugs (hyoscino butylbromide) may be no more effective than placebo at reducing pain of acute renal colic (low-quality evidence).

Note
We found no clinically important results about the effects of antispasmodic drugs compared with NSAIDs or opioids.

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QUESTION What are the effects of interventions for the management of acute renal colic?

OPTION OPIOID ANALGESICS *New*

We found no clinically important results about the effects of opioid treatment for people with acute renal colic.

Non hanno visto la Cochrane Review!

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Nonsteroidal anti-inflammatory drugs (NSAIDs) versus opioids for acute renal colic (Review)

Holdgate A, Pollock T



THE COCHRANE COLLABORATION®

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Nonsteroidal anti-inflammatory drugs (NSAIDs) versus opioids for acute renal colic (Review)
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Background
Renal colic is a common cause of acute severe pain. Both opioids and nonsteroidal anti-inflammatory drugs (NSAIDs) are recommended for treatment, but the relative efficacy of these drugs is uncertain.

Objectives
To examine the benefits and disadvantages of NSAIDs and opioids for the management of pain in acute renal colic.

Search strategy
We searched the Cochrane Renal Group's specialised registers, the Cochrane Central Register of Randomised Controlled Trials (CENTRAL), The Cochrane Library, MEDLINE, EMBASE and handsearched reference lists of retrieved articles.
Date of most recent search: 30 April 2006

Selection criteria
Randomised controlled trials (RCTs) comparing any opioid with any NSAID, regardless of dose or route of administration were included.

Data collection and analysis
Data was extracted and quality assessed independently by two reviewers, with differences resolved by discussion. Dichotomous outcomes are reported as relative risk (RR) and measurements on continuous scales are reported as weighted mean differences (MD) with 95% confidence intervals. Subgroup analysis by study quality, drug type and drug route have been performed where possible to explore reasons for heterogeneity.

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Nonsteroidal anti-inflammatory drugs (NSAIDs) versus opioids for acute renal colic (Review)
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Main results

Twenty trials from nine countries with a total of 1613 participants were identified. Both NSAIDs and opioids lead to clinically significant falls in patient-reported pain scores. Due to unexplained heterogeneity these results could not be pooled although 10/13 studies reported lower pain scores in patients receiving NSAIDs. Patients treated with NSAIDs were significantly less likely to require rescue medication (RR 0.75, 95% CI 0.61 to 0.93, P = 0.007), though most of these trials used pethidine. The majority of trials showed a higher incidence of adverse events in patients treated with opioids, but there was significant heterogeneity between studies so the results could not be pooled. There was significantly less vomiting in patients treated with NSAIDs (RR 0.35, 95% CI 0.23 to 0.53, P = 0.00001). In particular, patients receiving pethidine had a much higher rate of vomiting compared with patients receiving NSAIDs. Gastrointestinal bleeding and renal impairment were not reported.

Authors' conclusions

Both NSAIDs and opioids can provide effective analgesia in acute renal colic. Opioids are associated with a higher incidence of adverse events, particularly vomiting. Given the high rate of vomiting associated with the use of opioids, particularly pethidine, and the greater likelihood of requiring further analgesia, we recommend that if an opioid is to be used it should not be pethidine.

In questa SR "child" non compare nel testo

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Guidelines on Urolithiasis

H.-G. Tiselius, D. Ackermann, P. Alken, C. Buck, P. Conort, M. Gallucci, T. Knoll



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Table 13: Recommendations and considerations regarding treatment of the patient with renal colic

Recommendations	LE/GR	Selected references	Comment
Treatment should be started with an NSAID	1b/A	1-4	5.1.1
Diclofenac sodium affects GFR in patients with reduced renal function, but not in patients with normal renal function	2a	6	5.1.3
Diclofenac sodium is recommended as a method to counteract recurrent pain after an episode of ureteral colic	1b/A	5	5.1.2

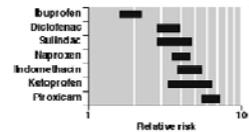
LE = level of evidence; GR = grade of recommendation; GFR = glomerular filtration rate; NSAID = non-steroidal anti-inflammatory drug.

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Farmaco di scelta...

- Ibuprofene
– Minor tossicità GI



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CLINICAL QUESTIONS

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D. Quale livello di idratazione ritieni appropriato?

1. Mantenimento
2. Restrizione idrica
3. 150% mantenimento

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QUESTION What are the effects of interventions for the management of acute renal colic?

OPTION FLUIDS (INTRAVENOUS OR ORAL) New

We found no clinically important results about the effects of fluid management of acute pain in people with renal or ureteric calculi.

BMJ Clinical Evidence

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Fluids and diuretics for acute ureteric colic (Review)

Worster A, Richards C



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Fluids and diuretics for acute ureteric colic (Review)
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Background
Acute ureteric colic is a common cause of severe and debilitating pain. Theoretically, increasing fluid flow through the affected kidney might expedite stone passage, thereby improving symptoms more quickly. Unfortunately, for interventions such as high volume intravenous or oral fluids and diuretics that are aimed at doing this, the efficacy and safety is uncertain.

Objectives
To look at the benefits and harms of diuretics and high volume (above maintenance) intravenous or oral fluid therapy for treating adult patients presenting with uncomplicated acute ureteric colic.

Search strategy
We searched the Cochrane Renal Group's specialised register (July 2001), the Cochrane Central Register of Controlled Trials (CENTRAL - The Cochrane Library issue 3, 2004), MEDLINE (1986 - July 2004), EMBASE (1980 - July 2004) and handsearched reference lists of nephrology and urology textbooks, review articles, relevant trials, and abstracts from nephrology scientific meetings. We sent letters seeking information about unpublished or incomplete trials to investigators known to be involved in previous trials.
Date of last search: July 2006

Selection criteria
All randomised controlled trials (RCTs) and quasi RCTs (including the first period of randomised cross-over studies) looking at diuretics or high volume intravenous or oral fluids for treating uncomplicated acute ureteric colic in adult patients presenting to the emergency department for the first time during that episode were to be included.

Data collection and analysis
Two reviewers independently assessed trial quality and extracted data. Statistical analyses were performed using the random effects model and the results expressed as relative risk (RR) for dichotomous outcomes or weight mean difference (MD) for continuous data with 95% confidence intervals (CI).

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Fluids and diuretics for acute ureteric colic (Review)
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Main results
One trial (60 participants) was identified. This study compared no fluids for six hours versus three litres of IV fluids received over a six hour period. There was no significant difference in pain at six hours (RR 1.06, 95% CI 0.71 to 1.57), surgical stone removal (RR 1.20, 95% CI 0.41 to 3.31) or manipulation by cystoscopy (RR 0.67, 95% CI 0.21 to 2.13).

Authors' conclusions
Unfortunately, we could find no credible evidence in the literature regarding either of these two treatment modalities. Given their potential positive impact, the role of diuretics and high volume fluid therapy in acute ureteric colic should be examined to determine their safety and efficacy in facilitating stone passage.

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Scenario Clinico (7)

- Viene somministrato ketoprofene (50 mg) e.v. ed iniziata infusione di polisalina pediatrica di mantenimento (70 ml/h)
- Dopo circa 30 minuti si assiste a un discreto miglioramento della sintomatologia dolorosa che, tuttavia, si ripresenta a distanza di circa 3 ore.
- Angela viene ricoverata nella UO di Nefrologia Pediatrica per il monitoraggio clinico e per i provvedimenti terapeutici necessari

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Scenario Clinico (8)

Durante il ricovero:

- La sintomatologia dolorosa si risolve in giornata (con ketoprofene 50 mg e.v. x 3/die) e la macroematuria scompare dopo 48 ore.
- Vengono eseguiti:
 - Scintigrafia renale con MAG 3: "funzionalità renale separata ben bilanciata; rene sx lievemente ingrandito; non ostruzione al deflusso di urina".
 - Test di screening per la calcolosi: uricuria, calciuria, fosfaturia, ossaluria, test di Brand per cistinuria, creatininuria.

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Scenario Clinico (9)

- In accordo con gli urologi viene intrapresa terapia con alfuzosina cloridrato per indurre l'espulsione del calcolo.
- Angela viene dimessa in 4^a giornata
- Dopo 15 gg Angela viene ricoverata e sottoposta a rimozione del calcolo per via endoscopica.
- Il decorso post-operatorio è privo di complicanze.

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CLINICAL QUESTIONS

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E. Ritieni appropriata la rimozione del calcolo?

1. No
2. Sì

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Indications for active stone removal

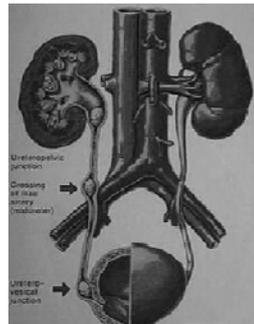
- The size, site and shape of the stone at the initial presentation influence the decision to remove the stone.
- The likelihood of spontaneous passage must also be evaluated.
- Spontaneous stone passage can be expected in up to 80% in patients with stones < 4 mm in diameter.
- For stones with a diameter > 7 mm, the chance of spontaneous passage is very low

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Overall passage rate of ureteral stones

- Proximal ureteral stones: 25%
- Mid-ureteral stones: 45%
- Distal ureteral stones: 70%



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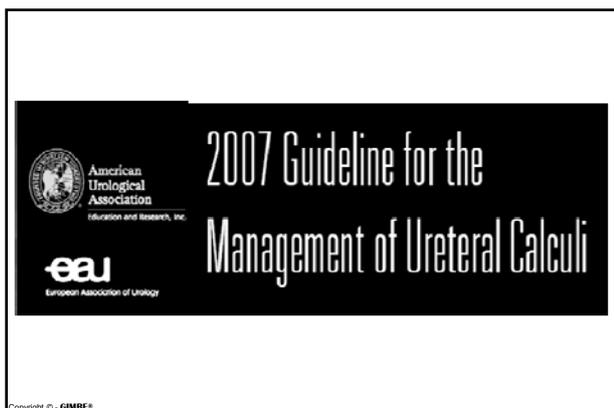
Table 14: Indications for active stone removal

	LE/GR	Selected references
Active stone removal should be considered when the stone diameter is ≥ 7 mm because of a low rate of spontaneous passage	2A/B	1-5
When adequate pain relief cannot be achieved	4/B	
When stone obstruction is associated with infection*	4/B	
When there is a risk of pyonephrosis or urosepsis*	4/B	
In single kidneys with obstruction*	4/B	
Bilateral obstruction*	4/B	

* Diversion of urine with a PN catheter or bypassing the stone with a stent are minimal requirements in these patients.
LE = level of evidence; GR = grade of recommendation

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For Ureteral Stones <10 mm

Option: In a patient who has a newly diagnosed ureteral stone <10 mm and whose symptoms are controlled, observation with periodic evaluation is an option for initial treatment. Such patients may be offered an appropriate medical therapy to facilitate stone passage during the observation period.

[Based on review of the data and panel opinion Level 1A]

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For Ureteral Stones >10 mm

Although patients with ureteral stones >10 mm could be observed or treated with MET, in most cases such stones will require surgical treatment. No recommendation can be made for spontaneous passage (with or without medical therapy) for patients with large stones.

MET= Medical expulsive therapy

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Scenario Clinico (10)

- Lo screening per la calcolosi dimostra iperuricuria; attualmente è in corso l'analisi chimico-fisica del calcolo.
- Un'ecografia renale, eseguita in fase di dimissione, dimostra risoluzione della dilatazione uretero-pielica
- Angela viene dimessa in terza giornata con il seguente piano terapeutico:
 - alcalinizzazione delle urine con citrato di potassio bustine da 1 g: ½ bustina/die al fine di mantenere il pH urinario ≥ 7
 - abbondante (circa 2 litri/die) idratazione per os

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