ease is chronic in nature. The rationale for each treatment option and the possible necessity of changing medications and using combination treatments should be emphasized.

Acidic foods, caffeine, alcohol, artificial sweeteners and chocolate may aggravate the symptoms of interstitial cystitis in some patients and should be avoided.16

**ORAL TREATMENTS**

First-line oral treatments for interstitial cystitis include tricyclic antidepressants, antihistamines and pentosan polysulfate (Elmiron). No placebo-controlled studies with tricyclic antidepressants have been performed, but these medications have been found to be beneficial in several open-label studies.24 Tricyclic antidepressants block pain arousal and are widely used in pain clinics for their pain blocking effects. Other medications that may reduce the symptoms of interstitial cystitis include sedatives (for improved sleep) and medications that inhibit nociception. Some of the most commonly used tricyclics are amitriptyline (Elavil), doxepin (Sinequan) and imipramine (Tofranil), administered in dosages of 25 to 75 mg at bedtime. These agents may be started at very low dosages and gradually titrated up until symptom relief is obtained or until side effects become bothersome. Use of hydroxyzine (Atarax), an antihistamine, is based on the hypothesis that histamine released by mast cell degranulation may be responsible for symptoms of interstitial cystitis. Hydroxyzine (in a dosage of 25 to 75 mg at bedtime) and the H₂-receptor antagonist cimetidine (Tagamet), in a dosage of 300 mg twice daily, were both effective in open-label studies.25,26

Pentosan polysulfate is the only oral therapy for the treatment of interstitial cystitis symptoms that has been studied in placebo-controlled trials.9,25,27,28 Pentosan polysulfate is a highly sulfated, semisynthetic glucosaminoglycan with chemical and structural similarities to naturally occurring glucosaminoglycans. The medication is well tolerated and has a favorable side effect profile. In one study, bladder pain was relieved by at least 50 percent in 38 percent of patients taking pentosan polysulfate compared with 18 percent improvement in patients treated with placebo.29 It may take three to six months for patients to respond to pentosan polysulfate.29 The usual dosage is 100 mg orally three times per day. Adverse reactions to pentosan polysulfate include diarrhea, dyspepsia, reversible alopecia, headache, rash, dizziness, abdominal pain and uncommon liver function abnormalities (1 to 4 percent).

Although no research has been done, some experts in the treatment of interstitial cystitis combine two of the above oral medications for an enhanced treatment response. Some patients feel better after taking aspirin or a nonsteroidal anti-inflammatory drug, probably because mast cell degranulation releases prostaglandins and leukotrienes.11 Other drugs that may be used to treat interstitial cystis-

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**TABLE 2**

**Current Treatment of Interstitial Cystitis**

<table>
<thead>
<tr>
<th>General measures</th>
<th>Bladder Diet</th>
</tr>
</thead>
<tbody>
<tr>
<td>Support and reassurance</td>
<td></td>
</tr>
<tr>
<td>Elimination of foods that increase symptoms</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Oral therapy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pentosan polysulfate (Elmiron)*</td>
</tr>
<tr>
<td>Tricyclic antidepressants (e.g., amitriptyline [Elavil], doxepin [Sinequan], imipramine [Tofranil])†</td>
</tr>
<tr>
<td>Antihistamines (H₁- and H₂-receptor antagonists, hydroxyzine [Atarax], cimetidine [Tagamet])†</td>
</tr>
<tr>
<td>Nonsteroidal anti-inflammatory drugs; bladder analgesics;</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Intravesical therapy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimethyl sulfoxide (Rimso-50)*</td>
</tr>
<tr>
<td>Heparin†</td>
</tr>
<tr>
<td>Silver nitrate†</td>
</tr>
<tr>
<td>Dimethyl sulfoxide plus heparin or hydrocortisone†</td>
</tr>
<tr>
<td>Oxychlorosene, 0.4 percent‡</td>
</tr>
<tr>
<td>Bacillus Calmette-Guérin*</td>
</tr>
</tbody>
</table>

| Other |
| Transcutaneous electrical nerve stimulation* |

| Physical therapy: |

*—Placebo, controlled trial.
†—Open-label trial.
‡—No studies of efficacy.

Interstitial Cystitis Medication

- Author: Eric S Rovner, MD; Chief Editor: Edward David Kim, MD, FACS  more...

Updated: Apr 10, 2014

Medication Summary

The goal of pharmacologic therapy in interstitial cystitis is to relieve symptoms. Medication may be administered orally or intravesically. Urinary analgesics include pentosan polysulfate sodium. (One report suggests a beneficial role for oral cimetidine.) Other agents used with less success include the following:

- L-arginine
- Nalmefene
- Anticholinergic agents - Eg, oxybutynin, oxybutynin XL, tolterodine (Detrol and Detrol LA)
- Hyoscyamine
- Corticosteroids
- Antispasmodics
- Immunosuppressives
- Anti-inflammatory medications
- Calcium channel blockers

Antihistamines, 1st Generation

Class Summary

Antihistamines inhibit binding to the H1 histamine receptor.

View full drug information

Hydroxyzine (Vistaril)
Hydroxyzine is an H1 histamine receptor blocker that may inhibit mast cell secretion and may suppress histamine activity in the subcortical region of the central nervous system (CNS). Adult dosing is 25-75mg/day orally. Hydroxyzine is a pregnancy category C drug.

### Antidepressants, TCAs

#### Class Summary

Tricyclic antidepressants are a complex group of drugs that have central and peripheral anticholinergic effects, as well as sedative effects. They have central effects on pain transmission. They block the active reuptake of norepinephrine and serotonin.

View full drug information

#### Amitriptyline

Amitriptyline is an oral tricyclic antidepressant that inhibits reuptake of serotonin and/or norepinephrine at the presynaptic neuronal membrane, which increases concentration in the CNS. It may have anticholinergic and sedative effects. Adult dosing is 25-75 mg orally at bedtime. Amitriptyline is a pregnancy category D drug.

### Analgesics, Urinary

#### Class Summary

Urinary analgesics relieve pain locally.

View full drug information

#### Pentosan polysulfate sodium (Elmiron)

Pentosan polysulfate sodium is a negatively charged, synthetic sulfated polysaccharide with an affinity for mucosal membranes. It repletes defects in the glycosaminoglycan layer. Adult dosing is 100mg orally 3 times daily. Pentosan polysulfate sodium is a pregnancy category B drug.

### Urologics, Other

Class Summary

Instillation therapy may use dimethyl sulfoxide (DMSO). It may also use cauterizing agents for the removal of granulation tissue and dermatologic agents for their cleansing and disinfection and for the removal of necrotic debris.

View full drug information

Dimethyl sulfoxide (Rimso-50)

Dimethyl sulfoxide (DMSO) provides anti-inflammatory action, membrane penetration, antifungal activity, cryoprotective effects for living cells and tissues, collagen dissolution action, mast cell stimulation, nerve blockade, diuresis, cholinesterase inhibition, vasodilation, and muscle relaxation. It may be combined with heparin, steroids, or bicarbonate. In adults, instill 50mL of aqueous 50% solution directly into the bladder by catheter or Asepto syringe and allow it to remain for 20 minutes. DMSO is a pregnancy category X drug.

Antibacterials, Topical

Class Summary

Antimicrobials with antiseptic and astringent qualities may reduce morbidity.

View full drug information

Silver nitrate

Silver nitrate is used for its caustic, antiseptic, and astringent qualities. In adults, administer concentrations ranging from 1:5000 to 2% intravesically for 2-10 minutes. Silver nitrate is a pregnancy category C drug.

Oxychlorosene (Clorpactin WCS-90)

Sodium oxychlorosene exerts detergent action on bladder mucosa. It is reserved for patients in whom DMSO or silver nitrate instillations fail. In adults, administer 0.4% solution intravesically for 2-3 minutes at 60-80cm water pressure (4-6 treatments weekly). Sodium oxychlorosene is a pregnancy category C drug.
Anticoagulants, Hematologic

Class Summary

Anticoagulants prevent recurrent or ongoing thromboembolic occlusion of the vertebrobasilar circulation.

View full drug information

Heparin

Polysaccharide glycosaminoglycans may exert a protective effect on the bladder. Heparin has been shown to reduce relapses in patients who respond to DMSO. It is an analogue to the polysaccharide glycosaminoglycan lining of the bladder. Adult dosing is 10,000U intravesically in 10mL sterile water monthly. Polysaccharide glycosaminoglycans are pregnancy category C drugs.

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