### Tic Disorders in Children and Adolescents Ages 6 to 17 Years Old

#### Level 0

Comprehensive assessment: Assess course (age of onset, types of tics, tic frequency, alleviating and aggravating factors) duration and severity. Careful assessment that attends to issues of social (bullying), educational (reading impairment), physical impairment (pain due to tics) as well as complicating comorbidity. Review for most common comorbid presentations: ADHD, tics, separation anxiety, ASD. Health status: Infections (especially group A streptococcus, Mycoplasma, Influenza), endocrine disorders, autoimmune disorders, genetic disorders, Wilson’s, CNV’s associated with OCD/tics; Secondary to a medication: stimulants, lamotrigine. Family history (for OCD, tics, autoimmunity).

- If tics are not causing impairment, educate but no treatment is necessary.
- Specialty referral as appropriate—child psychiatry or neurology or for CBT/HR.

#### Level 1

Mild-moderate impairment, secondary to tics, use habit reversal therapy (HRT) if possible (check [www.tsa-usa.org](http://www.tsa-usa.org) for trained therapists). Alpha-2 agonists (clonidine or guanfacine) especially if ADHD is present.

#### Level 2

Risperidone, aripiprazole or haloperidol, in low doses.

#### Level 3

Trial of medication not already used at Level 1 or a trial of pimozide (there are dosing, drug interaction safety, and QTc concerns with this agent).

#### Level 4

Antipsychotic in combination with SSRI, clonazepam, alpha-2 agonists, or topiramate depending on target symptoms. Severity of illness should drive the use of one or two agents.
**Tic Disorders in Children and Adolescents Ages 6 to 17 Years Old (continued)**

<table>
<thead>
<tr>
<th>Drug Name</th>
<th>Level of Evidence</th>
<th>Starting Dose (mg)</th>
<th>Usual Dose (mg/day)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clonidine</td>
<td>A</td>
<td>0.025 – 0.05</td>
<td>0.10 – 0.30</td>
</tr>
<tr>
<td>Guanfacine</td>
<td>A</td>
<td>0.5 – 1.0</td>
<td>1.0 – 3.0</td>
</tr>
<tr>
<td>Risperidone</td>
<td>A</td>
<td>0.125 – 0.50</td>
<td>0.75 – 3.0</td>
</tr>
<tr>
<td>Aripiprazole</td>
<td>B+</td>
<td>1.0 – 2.5</td>
<td>2.5 – 10</td>
</tr>
<tr>
<td>Haloperidol*</td>
<td>A</td>
<td>0.25 – 0.5</td>
<td>1 – 4</td>
</tr>
<tr>
<td>Pimozide◊</td>
<td>A</td>
<td>0.5 – 1.0</td>
<td>2 – 8</td>
</tr>
<tr>
<td>Ziprasidone◊</td>
<td>B</td>
<td>20</td>
<td>20 – 40</td>
</tr>
<tr>
<td>Olanzapine</td>
<td>B</td>
<td>2.5 – 5.0</td>
<td>2.5 – 12.5</td>
</tr>
<tr>
<td>Quetiapine</td>
<td>B</td>
<td>25</td>
<td>25 – 200</td>
</tr>
<tr>
<td>Fluphenazine</td>
<td>B</td>
<td>0.5 – 1.0</td>
<td>1.5 – 10</td>
</tr>
<tr>
<td>Tetrabenazine</td>
<td>B</td>
<td>25</td>
<td>37.5 – 150</td>
</tr>
</tbody>
</table>

◊ EKG monitoring; *cyt2D6 testing for doses above 0.05mg/kg/day

**Hierarchical Approach in Pharmacotherapy for Tics:**
- Mild tics: No medication treatment
- Moderate tics: Alpha-2 agonists, Atypical neuroleptics
- Severe tics: Atypical neuroleptics, Typical neuroleptics (e.g., pimozide, haloperidol, fluphenazine)

**Patient Characteristics Best Suited for Tic Behavioral Therapy**
- No severe ADHD
- No substance abuse
- No severe oppositionality
- Stable family environment
- No severe anxiety or mood disturbance
- Age >= 9 years (but some success with motivated younger patients)

**Tic Disorders and Comorbidities: ADHD**
- Treat the ADHD conservatively
- Tics are not universally worse on stimulant (Bloch et al. 2009; Pringsheim and Steeves 2011; Tourette Syndrome Study Group 2002)
- Alpha-2 agonists show better improvement in tic severity if ADHD is comorbid (Bloch et al. 2009)
Tic Disorders in Children and Adolescents Ages 6 to 17 Years Old (continued)

Tic Treatment Pearls:
- Treating the tics may help comorbid condition (e.g. OCD, ADHD).
- Alpha-2 agonists have demonstrated the most efficacy for tics with comorbid ADHD.
- EKG monitoring and pharmacogenomics with pimozide.

Resources
- Children
  - Matthew and the Tics available at http://www.tsa-usa.org/aPeople/Youth/matthew_tics.html
- Parents/caregivers
- Clinicians
- Relevant websites
  - FDA, www.fda.gov/Drugs/ResourcesforYou/Healthprofessionals
  - Association for Behavioral and Cognitive Therapies, www.abct.org
  - Developmental-Behavioral Peds, http://www2.aap.org/sections/dbpeds/
  - Tic Severity Checklist, www.medicalhomeportal.org/link/4504
  - Teaching the Tiger – A Handbook for (Educators), www.hopepress.com/books/teaching_the_tiger.html
  - Bullying, http://www.stopbullying.gov/
References

