

Tic Disorders

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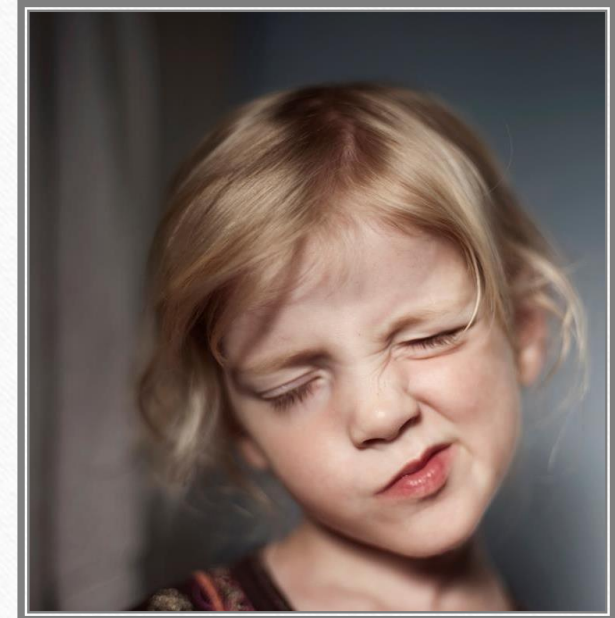
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Objectives

- To recognize tics and tic disorders
- To identify the differential diagnosis and medical workup for tics
- To explain treatment options for tics to patients/families, including therapy and medication options
- To apply knowledge about differential diagnosis and treatment options to patient cases

Tics

- **Tic:** A sudden, rapid, recurrent, non-rhythmic movement or vocalization.
- **Premonitory urge:** sensory phenomena (itch, tingle, vague discomfort) that precede and trigger the urge to tic
- Suggestible and suppressible
- **Exacerbating factors:** psychosocial stress, temperature changes, illness, fatigue
- Rarely occur during sleep
- Natural course: **waxing and waning** symptoms.
- Genetic: first degree relative with TD = 5-15x increased risk. Can also be sporadic





Types of Tics

- **Simple motor tics**

- Fast, brief, involving 1-2 muscle groups
- Eye blinking, shoulder shrugs, head jerks, facial grimaces, abdominal tensing

- **Complex motor tics**

- Larger muscle groups, last longer, Sequentially and/or simultaneously produced, coordinated
- hand gestures, jumping, touching, pressing, repeatedly smelling an object.

- **Simple vocal tics**

- Solitary, meaningless sounds and noises
- Grunting, sniffing, snorting, throat clearing, humming, coughing, barking or screaming.

- **Complex vocal tics**

- Linguistically meaningful utterances
- Partial words, words out of context (oh boy!), repeated sentences, coprolalia, palilalia or echolalia



Tic Disorders DSM 5

- **Tourette's Disorder**
 - Both multiple motor and one or more vocal tics present at some time during the illness
 - May wax and wane in frequency but persist at least a year since first tic onset
 - Not attributable to effects of a substance or another medical condition.
 - Onset before age 18
- **Persistent (Chronic) Motor or Vocal Tic Disorder**
- **Provisional tic disorder**



Chronic Tic Disorders

- Average age of onset: **7** years
- Prevalence/severity peak: **9-12** years
- Remission/marked attenuation: 65% by 18-20 years
- Male-female ratio of **2:1—4:1**
- Prevalence
 - CTD: 1-3%, TD: 1%
 - Transient tic disorders: 20% life time prevalence



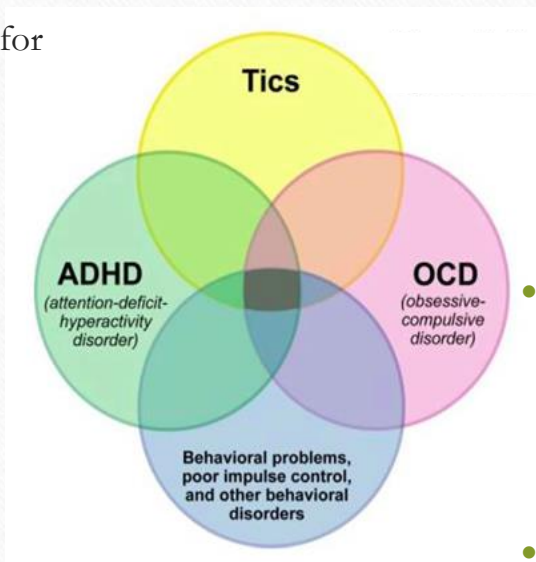
Co-morbidities

- **Obsessive-Compulsive Disorder**

- 20%-60% of TD patients meet criteria for OCD
- 30%-28% of OCD patients report co-morbid tics

- **Attention-Deficit/Hyperactivity Disorder**

- Up to 50% of children with CTD
- TD: as high as 60-80%
- Co-occurrence = disruptive behaviors, learning disorders and academic difficulties (4x)
- ADHD diagnosis often precedes onset of tics.



- **Learning disabilities**

- 23%
- High rates of school-related problems. Especially if co-morbid ADHD
- Male gender and history of perinatal problems increase risk

- **Autism Spectrum Disorder**

- Careful assessment to differentiate primary TD, primary ASSD or ASD with co-occurring tics.
- 4.6% of youth with TD had comorbid ASD

- **Anxiety and Depression**

- Especially if tics persist into adulthood

Medical Work-up



- Organic process: sudden onset of severe tics, atypical tics, mental status change
 - Consider CO poisoning, stroke, CNS infection, PANDAS/PANS
- Labs: Hemoglobin, renal/hepatic function, thyroid panel, ferritin, UDS
- If indicated, tests for co-occurring infection: culture, rapid viral tests
- EEG and brain imaging NOT routinely recommended unless neurological findings.

Differential Diagnosis

- **Stereotypies**

- Rhythmic, no change over time, no premonitory urge

- **Myoclonus**

- **Dystonia**

- **Chorea**

- **Substances:** Stimulants, SSRIs, lamotrigine, cocaine

- **Developmental/benign movement disorders**

- benign paroxysmal torticollis
- Sandifer's syndrome
- benign jitteriness of newborns
- shuddering attacks



- **Neurological diseases**

- Rare for tics to be the only manifestation
- Tumor, trauma, anoxia, stroke, frontal-subcortical brain lesions
- Wilson's disease
- Neuroanthocytosis
- Huntington's syndrome
- pantothenate kinase-associated neurodegeneration

What is it?



- **Joey** is an 8 year old male with ADHD, well controlled on methylphenidate. Recently he has started clearing his throat. Happening at school and home. Well over 100 times a day. Driving family members crazy. Joey doesn't even notice he is doing it.
- **Cooper** is a 5 year old male presenting for evaluation of a repetitive movement. He shakes his hands. Happens many times throughout the day. Often when he is excited but also when he is upset. Cooper says it feels good to do it. He also makes repetitive statements.



What is it?

- **Claudia** is a 16 year old female presenting with concern for some abnormal movements. She cannot control the movements and holds unusual postures. There are times when she experiences muscle stiffness and increased clumsiness. Tremor noted on exam. She has been increasingly fatigued recently. No prior concerns.
- **Rebecca** is a 15 year old female. She bites her nails to the point that sometimes they bleed. Happens more during the school year but also when she is bored.

What is it?



- **Aden** is a 10 year old male with generalized anxiety. He has been stuttering recently. During the assessment he says “yeah, yeah, yeah” at the end of his sentences.
- **Steven** is a 15 year old male. Mother concerned for jerking movements. His arm jerks out to the side. He is clumsy and easily drops things. This tends to happen most in the morning. They have had concerns for ADHD as for years he has had periods of just staring off.
- **Julia** is a 12 year old female. She has been repetitively tapping her fingers. It is disruptive at school because it can be noisy. Parents notice it at home as well.

Treatment

- Decision to treat based on **level of impairment and distress** caused by tics
 - Often comorbid condition causes more functional impairment/impacts quality of life
- **Behavioral interventions**
 - Habit Reversal Training (HRT)
 - C-BIT
- **Medications**
 - Not many rigorous studies in children
 - Considered for moderate to severe tics causing severe impairment in quality of life or when medications target both tics and co-morbidities.

Behavior therapy

- **Comprehensive Behavioral Intervention for Tics (CBIT)**: evidenced-based behavioral intervention for diagnosis of tics or Tourette's Disorder
 - Adults and children studied 30+ years
 - **highly effective**
 - **quick response rate.**
 - Superior in comparison to Supportive Therapy and psychoeducation
- **CBIT/HR considered first line of non-pharmaceutical treatment for TS.**
- Studies completed include the following: HRT vs. Supportive Therapy (Wihelm et al., 2003; Am J Psychiatry), HRT vs. Supportive therapy (Deckersbach et al., 2006; Behav Res Ther), Behavior Therapy for Children With Tourette's Disorder: A Randomized Controlled Trial (John Piacentini; Douglas W. Woods; Lawrence Scahill; et al., JAMA2010;303(19): 1929-1937 (doi: 10. 1001/jama.2010.607) <http://jama.ama-assn.org/cgi/content/full/303/19/1929>

Habit reversal Training/CBIT: a multicomponent treatment

- **HABIT REVERSAL**

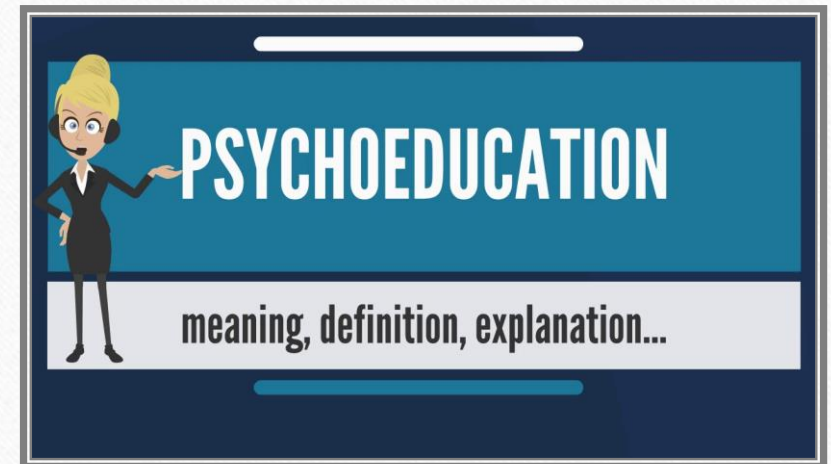
- Psychoeducation
 - Creating a Tic Hierarchy and Inconvenience Review
 - Motivation -developing a behavioral reward program for the client
 - Social Support
 - Functional-Based Assessment/Interventions
 - HR (Awareness/Competing Response)
 - Relaxation Techniques
 - Relapse Prevention
- CBIT interventions are focused on management rather than a cure to Tic/Tourette's Disorder.



Psychoeducation

Teaching the patient and family more about tic disorders, including the following:

- What are tics and what is a tic disorder?
- How common are they and what contributes to their development?
- How do we treat tic disorders (CBIT)?
- What are common social struggles and comorbidities with tic disorder?

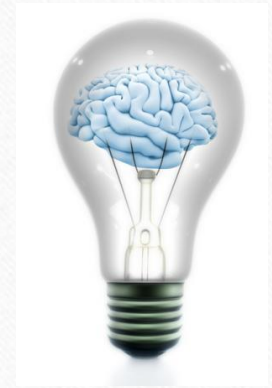


Tic hierarchy

- The tic hierarchy is based on the client's view point due to it being a self-management intervention. It is important to have the client motivated and identify the tic that is most bothersome to them.
- The clinician will want to start with the most bothersome tic and work down the client's list. The clinician can be flexible on the list with the client's wishes. This will also help the client be motivated in therapy to decrease their tics.
- When explaining to parents, it is important for them to be aware that what tic is most important or impairing to their child may not be the same tic for the parent and that is ok.

Functional-based Assessment/Interventions

- The purpose of the FBA is to **identify the internal and external environmental variables that may be increasing or maintaining the client's tics**. **Habit Reversal** addresses **internal environments** and **Functional Assessment/Interventions** address **external environments**.
 - These environments or factors are **individualized** for each client.
 - It is important to address **both** of these environments for treatment to be effective.
- Internal factors: premonitory urge, anxiety, or boredom
- External Factors: loud noises, social bullying, bright lights, chaos, etc.
- These variables are then modified for the purpose of reducing tics.
- The client's reactions to the variables are also modified to reduce tics.
- This is where relaxation techniques can be introduced to the client.



Relaxation

- **Diaphragmatic Breathing**

- Client learns to breathe from their diaphragm, rather from their chest. The training does include awareness of inhaling and exhaling slowly.

- **Progressive Muscle Relaxation**

- The client's body is divided up into a series of large muscle groups, each group is tensed and then relaxed. This method usually starts with the head and ends with the feet (not mandatory). Tension usually is maintained for 5 seconds and relaxation for about 10-15 seconds.



Awareness Training

- The purpose of awareness training is to get the client to verbally acknowledge when their tics are happening and when they are about to happen. *This is considered one of the most important processes of HRT.*
- Parents should be informed that this can cause stress within their relationship with their child. The child may not want to be made aware of their tics, but it is important to continue with the training.



Brian



- A 12 year old male comes into your office for evaluation of repetitive behaviors. Brian is displaying frequent shoulder shrugging and eye blinking. Brian is getting increasingly anxious because his teacher keeps asking him to stop and he is worried his peers are going to notice. At home, it gets in the way of completing his homework.
 - What is the diagnosis for this client?
 - What treatment do you recommend?
 - Family has questions about what to expect. What explanation would you give them?

Brian

- What might be alleviating/exacerbating factors?
- Let's brainstorm some competing responses.
- Problem-solving:
 - Brian is too anxious to go to school.
 - It's happening more in math class.
 - What should he say to the other kids?
 - He is getting discouraged.



Medications



- **Typical antipsychotics**

- FDA-approved medications: haloperidol and pimozide
- Pimozide better than haloperidol—more effective, better tolerated
- Lower doses required (compared to psychosis). Careful risk/benefit assessment

- **Haloperidol (Haldol)**

- Starting dose: 0.25-0.5 mg
- Range: 1-4 mg
- Side effects: extrapyramidal symptoms (EPS), anxiety flares

- **Pimozide (Orap)**

- Starting dose: 0.5-1 mg
- Range: 2-8 mg
- Side effects/considerations: EPS, EKG monitoring, 2D6 interaction



Medications



- **Atypical antipsychotics**

- Fewer extrapyramidal effects.
- More common: Metabolic syndrome-- weight gain, dyslipidemia. Sedation. Akathisia

- **Risperidone (Risperdal)**

- most studied (4 RCTs, 1 exclusively in children). At least as effective as pimozide and clonidine.
- Starting dose: 0.125-0.5 mg
- Dose range: 0.75-3.5 mg
- Considerations: prolactin elevation/gynecomastia

- **Aripiprazole (Abilify)**

- Starting dose: 1.0-2.5 mg
- Dose range: 2.5-15 mg

- **Ziprasidone (Geodon)**

- Starting dose: 5-10 mg
- Dose range: 10-40 mg
- Considerations: less weight gain. Must be taken with food to improve bioavailability (500 calories)



Medications



- **Alpha-2 Agonists**

- More favorable side effect profile compared to antipsychotics
- Effect size 0.5 (medium)
- Works better when co-morbid ADHD
- Side effects: sedation, hypotension, bradycardia, rebound effects if discontinued abruptly

- **Guanfacine (Tenex)**

- Starting dose: 0.5-1 mg
- Dose range: 1-4 mg

- **Guanfacine ER (Intuniv)**

- Starting dose: 1 mg; dose range: 1-4 mg

- **Clonidine**

- Starting dose: 0.5 mg
- Dose range: 0.1-0.4 mg

- **Clonidine ER (Kapvay)**

- Starting dose: 0.1 mg; dose range: 0.1-0.4 mg

NOT RECOMMENDED

- Deep brain stimulation
- Repetitive magnetic stimulation
- Special diets
- Dietary supplements
- Antibiotics or immunomodulatory treatments

Now what?

- Aurora is an 11 year old with diagnoses of ADHD and Tourette's disorder. She has been doing CBIT for 12 weeks with limited benefit. She has said she doesn't like school and now starting to give parents a hard time about going. Up until now, parents have been hesitant to consider medications but now more open after therapist suggested it may be helpful.



Aurora

- What is the differential diagnosis?
- What is the most problematic issue?
 - ADHD—stimulant vs alpha agonist
 - Tics—alpha agonist
 - Learning difficulties—IEP evaluation, ?undiagnosed learning disorder
 - Anxiety—different therapeutic approach



National Education & Advocacy Conference

Resources

- Tourette Association of America Website- has a variety of information for parents, clients, facilities, doctors, therapists, etc.
 - <https://tourette.org/>

References

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Thank you!

- If you have any further questions on CBIT therapy, please feel free to email me at:
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