

Impulse Control and Dysregulated Affect Symptoms in Tourette Syndrome

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1

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yes X no ____

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2

Aggressive Symptoms in Tourette Syndrome

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Aggressive Symptoms in TS Overview:

- Phenomenology & classifications of aggressive symptoms
- Causes of aggressive symptoms
- Treatment of Impulsive Aggression (IA) in TS
- Future Directions

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Adaptive Aggression

- Aggressive behaviors observed in animals
- Dominance behaviors
 - Territorial Aggression
 - "Female" Aggression

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Developmental Aggression

“Temper Tantrums”

- Occurs < 1/3 children ages 3-12 years
- Most common: ages 3-5 years (75%)
- Least common: ages 9-23 (4%)
- More common: boys > girls (3:1)
- Hx: trauma, seizure, tics*, hyperactivity, bedwetting, head banging, sleep problems

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Developmental Aggression:

Temper Tantrums



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Temper Tantrums in Preschoolers

279 children ages 3-5 years

- 4 Study Groups: Healthy, MDD, MDD+DR, and DR (ODD/ADHD/CD):
- MDD+DR (9x), DR (5x) more likely violent/destructive tantrums
 - MDD+DR likely to have longer tantrums
 - MDD + DR most likely to tantrum at home
 - MDD + DR, DR more likely to tantrum at school
 - DR most likely to tantrum outside
 - MDD+ DR most difficulty recovering from tantrum

Duration and Frequency of Tantrums predictive of serious clinical problems

(Belden, Thomson and Luby Pediatric 2008)

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Pathological Aggression

Aggressive behavior that is:

- Excessive in intensity, duration, frequency
- Inappropriate to expectable social context
- May be directed toward self, loved ones, others
- Age-inappropriate

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Type of Pathological Aggression

Proactive / Non-impulsive / Predatory

- Onset around age 6.5 years
- Associated with aggressive role models
- Accompanied by *decreased* autonomic activation

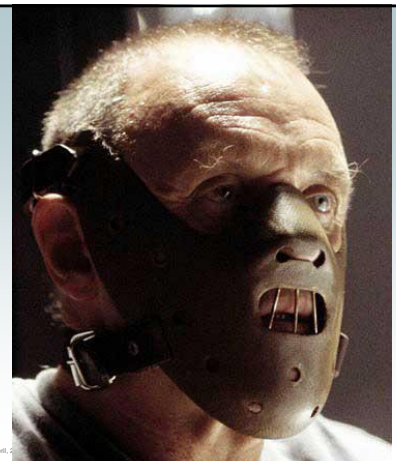
Examples: bullying, delinquency/sociopathy

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Pathological Aggression:

Psychopathy



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Pathological Aggression: Bullying

- Behavior is performed with the intent to harm:
 - Emotionally, physically, socially
- Behavior occurs in a relationship where an imbalance of power exists
 - Size, age, social status
- Aggressive behavior is repeated over time

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Pathological Aggression: Bullying

- Physical:
 - Being hit or beaten up, shoved, kicked
- Verbal:
 - Name-calling, teasing, threatening
- Emotional: "Relational Aggression"
 - Social exclusion from peer relationships, spreading rumors, cyber-bullying

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Pathological Aggression: Bullying

Characteristics of Bully Victims:

- More withdrawn, physically weaker, easily emotionally upset
- Few friends
- More often bullied by siblings

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Pathological Aggression: Bullying

More severe, chronic victimization :

- Associated with depression, anxiety
- Behavioral and academic problems
- Loneliness

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Type of Pathological Aggression

Reactive / Impulsive / "Maladaptive"

- Onset approx. age 4.5 years
- Can be associated with history of abuse/trauma
- Accompanied by *increased* autonomic activation

Examples: "rage attacks", affective storms

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Causes of Aggressive Symptoms

- Alcohol/substance abuse
- Medication side effects
- Toxins
- Neurological conditions
- Physical/sexual/emotional abuse
- Pain
- Sleep disorders
- Pre-existing psychopathology

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Medication-related Aggression

- Medication-induced activation
 - Disinhibition
 - Paradoxical reactions
 - Behavioral toxicity
- Sx: Irritability, anger/rage, excitability
hyperactivity, agitation, mood lability

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Causes of Aggressive Symptoms

Medications:

- Benzodiazepines
- Steroids
- Psychostimulants
- Guanfacine
- Neuroleptics
- SSRIs & other antidepressants *

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Causes of Aggressive Symptoms in Adults

Pre-existing psychopathology:

- Antisocial Personality Disorder
- Borderline Personality Disorder
- Major Depression
- Bipolar Disorder
- Schizophrenia
- Attention Deficit Disorder
- Intermittent Explosive Disorder

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Causes of Aggressive Symptoms in Children

Pre-existing psychopathology:

- Conduct Disorder
- Oppositional Defiant Disorder
- Major Depression
- Bipolar Disorder, Psychoses
- Attention Deficit Disorder
- Autistic Spectrum Disorders

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DSM-IV-TR Diagnostic Criteria for Intermittent Explosive Disorder (IED)

- Discrete episodes of failure to resist aggressive impulses resulting in serious assaultive acts or destruction of property (**Criterion A**)
- Degree of aggression grossly out of proportion to provocation or stressor (**Criterion B**)
- Aggressive episodes not due to direct effects of a substance, other mental disorder, or general medical condition (**Criterion C**)

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Prevalence & Correlates of DSM-IV IED

The National Co-morbidity Survey Replication

9282 people ages 18 and older
face-to-face household survey

- Lifetime prevalence: 5.4% - 7.3%
- 12-month prevalence: 2.7% - 3.9%
- Widely distributed in the population
- Usually begins in childhood or adolescence
- Significantly comorbid with mood, anxiety, and substance disorders
- Only 28.8% ever received treatment for their anger

(Kessler et al. 2006)

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Consensus Report on Impulsive Aggression (IA) in Child Psychiatry

- IA is a meaningful clinical construct
- IA can be reliably measured & appears similarly across diagnostic categories
- IA is informative about illness severity but not type
- Parallel studies of IA across disorders or broad diagnostic criteria can and should be conducted

(Jensen et al. 2007)

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Neurobiology of Aggression

- DA, opioids, androgens, ACTH facilitate sexual behavior & aggression
- Serotonin (5HT) and NE, possibly via neuromodulators GABA and glutamate mediate inhibitory responses
 - Disturbances of central 5HT linked with aggression and impulsivity
 - Low central 5HT associated with violence
 - Lesions of PFC or OFC linked with aggression

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Aggressive Symptoms in TS

- Common in clinical settings
- Impulsive type most typical
- Complex etiology
- Cause severe morbidity
- Treatment still largely non-specific

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International TS Database

3,500 TS cases in 22 countries

- 37% anger control problems ever
- 26% anger control problems now
- <10% anger control problems TS only

(Freeman et al. 1999)

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Explosive Outbursts in TS:

- Abrupt, unpredictable episodes of severe physical and/or verbal aggression
- Grossly out of proportion to any provocation
- Experienced as uncontrollable & distressing
- Accompanied by physiological activation

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Clinical Findings: Explosive Outbursts in TS Children

- Explosive Outbursts are symptoms, not a diagnosis
- These symptoms appear unrelated to tic type or severity
- These symptoms appear associated with specific psychiatric disorders, certain current psychotropic usage, environmental factors

(Sukhodolsky et al 2003; Budman et al. 2003, 2000, 1998; Stephens and Sandor, 1999)

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Assessment of Rage Symptoms in TS

Detail the nature of explosive outbursts in terms of:

- frequency
- severity
- duration
- triggers
- context

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Treatment of Rage Symptoms in TS

Comprehensive Evaluation

- **Diagnosis:** medical, psychiatric, neuropsychological psychosocial assessment
- **Medications:** side effects, drug interactions
- **Psychosocial function:** family, school/work, peers

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Treatment of Rage Symptoms in TS

- **Atypical antipsychotics:**
risperidone*, aripiprazole*, olanzapine*, ziprasidone, quetiapine
- **SSRIs:**
fluoxetine, sertraline, fluvoxamine, citalopram, paroxetine*
- **Anticonvulsants/Mood Stabilizers:**
Lithium, divalproex, lamotrigine, carbamazepine, topiramate
- **Other:**
psychostimulants, propranolol, clonidine, mecamylamine, EFAs

* published pilot studies in TS

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Treatment Recommendations for Use of Atypical Antipsychotics in Aggressive Youths (TRAAY)

1. Treat primary psychiatric disorder first
2. Use monotherapy when possible
3. Employ psychosocial and behavior treatments
4. If/when these initial steps fail, add concurrent atypical antipsychotic

(Pappadopolos et al. 2002)

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Treatment of Rage Symptoms in TS

- Psycho-education
- Parent Skills Training
- Family Therapy/Marital Therapy
- Social Skills Training
- Collaborative Problem Solving Strategies
- Anger Management programs
- Dialectical behavioral therapy
- Relapse prevention therapy
- Anti-Bullying Programs
- Physical exercise, nutrition, sleep hygiene

(Scahill et al. 2006; Green et al. 2003)

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Possible Causes of Behavioral Problems in TS

- Tic severity
- Comorbid psychiatric disorders
- Stigmatizing illness
- Family dysfunction
- Medication side effects/interactions
- Sensory hypersensitivities
- Psychosocial Stress

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Common Comorbidities: Tourette Syndrome

- Obsessive Compulsive Disorder: 25-50%
- Non-OCD Anxiety Disorders: 30-40%
- Attention Deficit Hyperactivity Disorder: 50-60%
- Mood Disorders: 30-40%
- Learning Disabilities: 20-30%

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Typical Complex Cases of Tourette Syndrome ("TS Plus")

- TS + OCD + ADHD
- TS + OC + separation anxiety/phobias
- TS + ADHD + LD
- TS + OCD + ADHD + Depression
- TS + PDD + OCS + ADHD
- TS + ADHD + Bipolar + Substance Abuse
- TS + OCD + Bipolar

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Tourette Syndrome and Attention Deficit Hyperactivity Disorder (ADHD)

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Attention-Deficit/Hyperactivity Disorder (ADHD)

Inattention

- Often fails to give close attention to details
- Difficulty sustaining attention
- Does not listen when spoken to directly
- Does not follow through on instructions
- Difficulties organizing tasks & activities
- Avoids to engage in tasks that require sustained mental effort
- Loses things necessary for tasks/activities
- Easily distracted
- Forgetful in daily activities

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Attention-Deficit/Hyperactivity Disorder (ADHD)

Hyperactivity-impulsivity

- Fidgety
- Difficulty remaining seated when expected
- Runs/climbs excessively & inappropriately
- Difficulty engaging in leisure activities quietly
- "On the go" or "Driven by a motor"
- Talks excessively
- Blurts out answers before questions are asked
- Difficulty awaiting turn
- Often interrupts/intrudes on others

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Attention-Deficit/Hyperactivity Disorder (ADHD)

- Onset of symptoms before age 7 years
- Impairment in > 2 setting (home, school, play)
- Clinically significant impairment in functioning
- Symptoms are not better accounted for by another mental disorder or medical condition

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TS and Attention Deficit Hyperactivity Disorder

- TS + ADHD = higher rates of comorbid psychiatric disorders (Biederman et al. 1998; Spencer et al. 1998)
- TS + ADHD = higher rates of impaired executive function and learning disabilities (Ozonoff et al. 1998; Channon et al 2003)
- TS impairment by disruptive behavioral disorders likely secondary to comorbid ADHD (and/or OCD) (Biederman et al. 1998; Carter et al. 2000; Sukhodolsky et al. 2003)

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Natural Course of ADHD and Tic Disorders

- Courses of ADHD and of Tic Disorders seem distinct
- No adverse impact of Tic Disorders on course of ADHD
- Treatment of ADHD with stimulants has limited effect on course of tics (Spencer et al. 1998)

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Psychostimulant medications

- Methylphenidate
- OROS methylphenidate
- Dextroamphetamine
- Dextroamphetamine + amphetamine
- D-methylphenidate
- Methylphenidate transdermal system (MTS)
- Lisdexamfetamine Dimesylate (LDX)

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Psychostimulant Diversion

- Data from American Association of Poison Control Centers' National Poison Data System 1998-2005: among youths ages 10-19 yrs
- ADHD prescriptions increased by 80%
 - Amphetamine prescriptions rose by 133%
 - Methylphenidate prescriptions rose by 52%
 - 30% of adolescents report having a friend who abuses psychostimulants
- Setlik et al. 2009

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Other Medications for ADHD

- Bupropion
- Venlafaxine, Desvenlafaxine
- Guanfacine
- Clonidine
- Tricyclic Antidepressants
- MAO inhibitors
- Modafanil, Armodafinil
- Atomoxetine

efficacy for ADHD and tics

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49

Other Treatments for ADHD

- Sleep hygiene
- Exercise
- Diet, vitamins
- Neurofeedback
- Cognitive Behavioral Therapy
- Organizational Skills Training
- Family Therapy
- School/classroom Modifications
- Recognition/treatment comorbidities

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Tourette Syndrome and Obsessive Compulsive Disorder

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Obsessive-Compulsive Disorder

- Either obsessions or compulsions
- At some point during course of disorder, symptoms are recognized as excessive and unreasonable
- Symptoms cause marked distress
- If Another Axis I Disorder is present, the content of the obsessions or compulsions is not restricted to it
- The disturbance is not the result of a general medical condition or effects of a substance

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Obsessions

- Unwanted thoughts, impulses, or images
- Cause marked anxiety
- Not excessive worries about real-life problems
- Efforts made to ignore, suppress, or neutralize
- Recognized as product of one's mind

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Compulsions

- Repetitive behaviors or mental acts
- Occur in response to obsessions
- Aimed at reducing distress or preventing dreaded event

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Possible OCD Clinical Subtypes

- Early onset
- Hoarding
- “Just Right”, Perfectionistic
- Primary Obsessional
- Scrupulosity
- Tic-Related

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Signs of Obsessive Compulsive Disorder

- Inability to get dressed within reasonable period
- Constant lateness
- Rituals for walking, bedtime, eating, or dressing
- Excessive hours spent on homework
- Frequent erasure holes in tests/ homework
- Repeated requests to answer same question or repeat specific phrases

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TS and Obsessive Compulsive Disorder

- High rates of comorbidity between TS and OCD
- High rates of OCD found in TS relatives
- Variable expression TS gene(s) \approx OCD subtype

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Tourette Syndrome and OCD

- Age at onset
- Gender ratio
- Medication Response

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Obsessions in Tourette Syndrome

Aggressive	Sexual
Religious	Somatic
Symmetry	Mental play

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Compulsions in Tourette Syndrome

Checking	Erasing
Touching	Hoarding
Writing/rewriting	“Evening-up”

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Treatment of OCD & Tics

- Cognitive Behavioral Therapy (CBT)
- Family Therapy
- Psychopharmacology

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SSRI Therapeutic Dose Ranges

Clomipramine	150 – 300 mg
Fluoxetine	20 – 80 mg
Sertraline	30 – 200 mg
Paroxetine	20 – 60 mg
Fluvoxamine	100 – 300 mg
Citalopram	20 –60 mg
Escitalopram	10-40 mg

- Dose to maximum tolerated, adjust during maintenance
- Therapeutic trial = maximum dose for 10-12 weeks
- Re-evaluate need for medication after one year

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62

Other Medications for OCD

Risperidone, Olanzapine
 Divalproex
 Clonazepam
 Neuroleptic augmentation
 Other augmenting agents:
 lithium, D-cycloserine, atypical neuroleptics, SSRI +
 clomipramine, inositol, SNRI, psychosurgery, DBS

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Impulsive/ Compulsive Spectrum Disorders

- Trichotillomania
- Self-injurious behaviors
- Compulsive Gambling
- Eating Disorders
- Kleptomania
- Body Dysmorphic Disorder

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64

Trichotillomania

Occurs in .02 – 3% patients with TS

- Repetitive hair pulling
- More common in TS + OCD than in either TS or OCD alone
- Treatment: HRT, N-Acetylcysteine, tic meds

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Self-injurious Behaviors (SIB)

- Non-suicidal self-injury/ deliberate destruction of one's body in the absence of intent to die
- Often associated with:

Mood Disorders	Autism/PDD
PTSD	Personality Disorders
Disruptive Behavior Disorders	
Substance Abuse	Eating Disorders

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Self-injurious Behaviors (SIB)

Occur in 17-60 % of patients with TS
 Associated with high levels obsessionality
 and hostility

- | | |
|--------------|-----------------|
| head banging | punching |
| slapping | orifice digging |
| self-biting | pinching |
| hitting | picking |

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67

Coprolalia

Occurs in 8-25% of patients with TS

- Utterance of obscene words/ statements
- Not contextually/socially appropriate
- Not necessary for diagnosis of TS

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Coprophagia

Occurs in 1- 6% of patients with TS

- Grabbing genitals
- Touching others sexually
- Pelvic Thrusting
- Picking at buttocks
- Obscene gestures

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The Anxiety Disorders

- Panic Attacks/Panic Disorder
- Generalized Anxiety
- Anxiety due to medication or drugs
- Obsessive- Compulsive Disorder
- Phobias
- Separation Anxiety Disorder

Rx: Cognitive-Behavioral Therapy, SSRI, SNRI,
 benzodiazepines, TCAs, MAOIs, propranolol,
 buspirone, bupropion

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Examples of Specific Phobia

- Animal type: animals, insects
- Natural environment type: storms, water, heights
- Blood-injection type: receiving a "shot"
- Situational type: tunnels, bridges, airplanes, car, social/performance
- Other type: fear of choking, vomiting

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Tourette Syndrome and Mood Disorders

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TS and Mood Disorders

- Comorbid Mood Disorders: strongly associated with illness morbidity
- Major Depression & Bipolar Disorder: highly significant predictors for psychiatric hospitalization and GAF < 50

(Coffey et al. 2000 J Amer Acad Child Adoles Psychiatry)

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The Mood Disorders

- Dysthymic Disorder
- Bipolar Disorder
- Cyclothymic Disorder
- Manic Episode
- Major Depressive Disorder
- Mood disorder due to medication or drugs

Rx: **unipolar:** SSRIs, SNRIs, TCAs, bupropion, trazodone, mirtazapine, MAOIs, ECT

bipolar: Lithium, carbamazepine, divalproex, lamigroline, atypical neuroleptics, ECT

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74

Anticonvulsants/Mood Stabilizers

Lithium
Valproate/Depakote
Lamigroline
Carbamazepine/Tegretol
Topiramate/Topamax*
Clonazepam/Klonopin*

Purpose: to treat cyclic mood disorders, intermittent explosive disorder, conduct disorder, aggression

These medications must be taken 2-3 times daily and require close supervision and blood tests

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Learning Disabilities

•**Learning Disorders:** Disorders of Reading, Math or Written Expression

•**Motor Skills Disorder:** Developmental Coordination Disorders

•**Communications Disorders:** Disorders of Expression, Reception, Stuttering, Phonology

•**Pervasive Developmental Disorders & Autistic Spectrum Disorders**

Rx:

Medical/Neurological/Psychiatric Evaluation, vision & hearing check, *Speech & Language evaluations, Neuropsychological Testing, supportive services for child & family, school interventions*

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76

Additional Information TS and Related Disorders

- National Tourette Syndrome Association (TSA)
42-40 Bell Boulevard, Bayside, NY 11361
718 224-2999
- Children and Adults with ADHD (CH.A.D.D.)
81 Professional Place, Suite 201
Landover, MD 20785
301 306-7070
- Obsessive Compulsive Foundation, Inc. (OCF)
90 Depot St., P.O. Box 70
Milford, CT 06460-0070
203-878-5669

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77