Behavioural Therapy for beginner participants

Thursday 9 June 2022, 10:00-13:00

Tic treatment – Learn how to become a tic therapist or enhance your skills
Welcome to the Behaviour Therapy Workshop for Beginners!

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The Netherlands

Dr. Zsanett Tarnok
Hungary
Program

10.00 – 11.00: Introduction
   Diagnostics
   Research/guidelines

11.00 – 11.10: Short break

11.10 – 12.10: Habit Reversal Training
   Exposure and Response Prevention

12.10 – 12.20: Short break

12.20 – 13.00: Function based interventions
   Relapse management
   Q&A
What is Tourette syndrome - diagnostics

• Video: [BILLIE EILISH TOURETTE. - YouTube](#)

• Definition of a tic
  - A sudden, rapid, recurrent, nonrhythmic motor movement or vocalization

• Motor and vocal tics

• Simple and complex tics
Simple motor tic

- Sudden, brief, ‘meaningless’ movement
- Recurs in bouts
- One muscle group

**Examples:**

*excessive eye blinking, nose movements, headshaking, shoulder jerking*
Complex motor tic

- More than one muscle group
- Movement can last longer
- A constellation of movements
- Sudden, semi-purposeful

**Examples:**

*Touching things, obscene gestures, facial grimacing together with body movements, at the same time sticking out the tongue, head shaking and grimacing, directly followed by a vocal noise*
Simple vocal tic

- Fast, “meaningless” sounds

**Examples:**
coughing, throat clearing, sniffing,
whistling, animal noises
Complex vocal tic

- Language, words, sentences

**Examples:**
Syllables, words, coprolalia, echolalia, palilalia, but
also blocking or disinhibited speech
Other tic features

- Suppressible (not 24/7!)
- Vary in type, severity, frequency over time
- Increase with stress (negative and positive)
- Often decrease with concentration (sport, music)

Waxing  Waning

- Often preceded by an unpleasant sensation…..
Open your eyes...
Premonitory urges

- Research: most TS patients (>90%) feel premonitory urges
- Sensations are mainly in the head, shoulders, throat, hands, stomach, upper legs and feet
- The awareness of urges start about 3 years after the beginning of tics
- Older children and adolescents report more sensations than younger children (Banaschewski et al., 2003): 34% 8-10 years old; 56% 11-14 years old; 68% 15-19 years old
Premonitory Urges
Leckman ea, 1993, Essing ea, 2021

- **Descriptions**
  - Urge to move
  - Impulse to tic
  - Tension
  - Anxiety / restlessness
  - Urge to apply pressure
  - Stretch
  - ‘just right’
  - Ache
  - Itch

- **Locations**
  - Face / head
  - Neck
  - Shoulders
  - Arms
  - Hands
  - Throat
  - Feet
  - Stomach

Fig 1: Density of premonitory urges (PU) for all tics (n=238 participants).
Tic Disorders in DSM-5

† Neurodevelopmental disorders – motor disorders
† Onset before age 18 years, not due to any other medical condition/substance

† Provisional tic disorder
  † Tics less than one year

† Persistent motor/vocal tic disorder
  † Either motor or vocal tics for more than one year

† Tourette’s disorder (TS)
  † At least two motor tics and one or more vocal tics at least one year
  † Often other symptoms and comorbidity

† Tic disorder not otherwise specified
  † Criteria are not met for one of the specific tic disorders
  † E.g., onset >18 years
ICD – 11 Classification

- Disease of the Nervous system
  - Motor Disorders
  - 8A05.0 Primary tics or tic disorders
    - In order to be diagnosed as Tourette syndrome, both motor and vocal tics must have been present for at least one year, although they may not manifest concurrently or consistently throughout the symptomatic course.
    - Kept the terms ‘chronic’ and ‘transient’
Prevalence
(Scharf et al. 2014: Movement Disorders)

~1%

**Table 1.** Published TS prevalence studies and extracted study data included in the meta-analysis and meta-regression.

<table>
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<th>Study No.</th>
<th>First Author</th>
<th>Publication Year</th>
<th>Study Area</th>
<th>Study Date</th>
<th>Geography</th>
<th>Diagnostic Criteria Used</th>
<th>Method</th>
<th>Mean Age</th>
<th>Sample Size</th>
<th>Total No. of TS Cases</th>
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*Data performed.

**Note:** DSM-IV (Diagnostic and Statistical Manual of Mental Disorders, 4th edition) criteria are equivalent to DSM-IV and have been translated as DSM-IV in diagnostic criteria analyses.

*Contact with the corresponding author has identified 4 TS cases identified in the meta-analysis subsample. This represents an estimated 15 cases in the target population.
Prevalence

- 5-8% of school aged children has tics
- Male-female = 3 : 1
When do tics usually start?

Age of Onset of Tics

Leckman 2000
What happens in early adulthood to tics? (Groth et al, 2017)

- Tics diminish over the years
- 17.7% of participants above age 16 years had no tics anymore
- 59.5% had minimal or mild tics
- 22.8% had moderate or severe tics
Causes of tics

- Genetics: many genes are involved (Willsley et al 2017, Yu et al 2019)
- Disturbances in Cortico-Striato-Thalamo-Cortical (CSTC) circuits (Badenoch et al, 2021)
  - Basal ganglia regulate fine motor output; too little inhibition in thalamo-cortical circuits
  - Disturbance in D1 and D2 dopamine receptors
  - Smaller volume of basal ganglia
- Perinatal factors: tic-severity and comorbidity:
  (Brander et al 2018; Han et al, 2021)
  - Smoking during pregnancy
  - Higher age father
  - Lower birth weight
- Autoimmunity: PANDAS (Martino et al, 2021)
  - *pediatric auto-immune neuropsychiatric disorders associated with strep infections*
Comorbidity is a rule not an exception
Related symptoms (TS)

- Impulsive, hyperactive, easily distracted
- Anger outbursts
- Risk seeking behavior, selfmutulation
- Compulsive symptoms
- Social problems
- Learning problems
- Anxiety and despressive symptoms

Comorbidity!!
Tourette Syndrome

Tics are just the tip of the iceberg

- Motor Tics
- Vocal Tics

- Obsessive Compulsive Disorder (OCD)
- Attention Deficit Hyperactivity Disorder (ADHD)
- Social Skills Deficits & Social Functioning
- Anxiety
- Autism Spectrum Disorder
- Conduct Issues
- Learning Disabilities
- Bullying
- Sleep Issues
- Sensory Processing Issues
- Behavioral Issues
- Rage

Source: tourette.org
Comorbidity

- ADHD: 40-60%
- OCD: 40%-55%
- ADHD & OCD: 30%
- ASD: 12%

*Hirschtritt ea, 2015; Martino & Leckman, 2013*
Comorbidity

- Anxiety: 30%
- Mood disorders: 30%
- Disruptive behaviour disorders: 30%
- Sleeping disorders: 27% (TS+ADHD 65%)
- Learning problems: 23%

86% has one or more comorbidities
Pure TS: only 14%

Eapen & Robertson, 2015; Hirschtritt ea, 2015
Differential diagnosis

Is it a tic or......?
How do you know it’s not something else?

Clinical features of tic disorders to be distinguished from similar phenomena of other disorders

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<th>Tic phenomena</th>
<th>Differential diagnosis</th>
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<td>Absences</td>
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<td>Focussing on tic control</td>
<td>Attention problem</td>
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<td>Tic repetition (after post-tic urge)</td>
<td>Obsessive–compulsive behaviour (OCB)</td>
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<td>“Excessive” tic</td>
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<td>MED-akathasia, juvenile Parkinson disease/OCB</td>
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<td>Neck jerking a.o.</td>
<td>Dystonia, MED-dyskinesia</td>
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<td>Convulsive grimacing</td>
<td>Blepharospasm/Facialis spasm</td>
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<td>‘Trembling’ tics</td>
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<td>Monotone tic (‘rhythmic’)</td>
<td>Stereotypy</td>
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<td>Tics during sleep</td>
<td>Restless legs/Rolandl epilepsy/parasomnia</td>
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<td>Excessive eye squeezing in adults</td>
<td>Blepharospasm</td>
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What makes tics different from other movement disorders?

- Childhood onset
- Wax and wane
- Increase with stress
- Suggestible
- Premonitory urge
- Suppressible
Is it a tic or adhd related behaviour?
How do you know it’s not ADHD?

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<th>ADHD</th>
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<td>Generally increased motor activity</td>
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<td>Circumscribed functional muscle groups</td>
<td>General motor hyperactivity</td>
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<td>Suddenly occurring (independent of waiting situation)</td>
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<td>Fixed pattern of quick actions</td>
<td>Disorganised, tempo change</td>
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<td>Badly modulated</td>
<td>Badly modulated</td>
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<td>Uniformly repeated (often in bouts)</td>
<td>Temporally irregular-intermittent (changing intensity)</td>
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Is it a tic or compulsion?
Repetitive behaviour in OCD and TS

- Tic
  - Uncomfortable, unwanted, uncontrolled
  - Reduces a premonitory urge
  - Temporarily suppressible
  - Increase of tension/urge
  - Not associated with fear or a wish to prevent risk, harm, damage

- Compulsion
  - Egodystonic
  - Sense of control
  - Preceded by a cognition
    - Reduces anxiety
  - Increase of anxiety when not given into or postponed
  - Uncomfortable, unwanted
  - Uncontrolled
  - Preceded by a cognition
# How do you know it’s not OCD?

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<td>Sensorimotor urges</td>
<td>Thoughts/imaginations (cognitive-emotional dissonance)</td>
</tr>
<tr>
<td>Not related to anxiety</td>
<td>Mostly related to anxiety</td>
</tr>
<tr>
<td>Ego-syntonic</td>
<td>Ego-dystonic</td>
</tr>
<tr>
<td>Involuntary (clustered sequence)</td>
<td>Voluntary (cyclic)</td>
</tr>
<tr>
<td>Onset in primary school (one peak)</td>
<td>Onset after primary school (two peaks)</td>
</tr>
<tr>
<td>Waxing and waning (from seconds to months)</td>
<td>Little changes over time</td>
</tr>
<tr>
<td>Also during sleep</td>
<td>Never during sleep</td>
</tr>
<tr>
<td>Similaties</td>
<td></td>
</tr>
<tr>
<td>Decrease with concentration</td>
<td>Decrease with concentration</td>
</tr>
<tr>
<td>Increase with emotional excitement</td>
<td>Increase with emotional excitement</td>
</tr>
<tr>
<td>Supressible (short-term)</td>
<td>Supressible (long-term)</td>
</tr>
</tbody>
</table>
Different types of repetitive behaviours in TS

Red columns: ‘OCD-like’; blue columns: ‘tic-like’

Worbe et al., 2010
Ticrelated OCD – a separate subtype?

Literature research 26 studies; N=2801 OCD; n=872 (31%) comorbid tic disorder

**Pure OCD/ no tics**
- Male vs Female equally divided
- Washing rituals
- Feelings and thoughts of anxiety before the compulsions
- Compulsions diminish anxiety
- Good response on SSRI

**OCD with tics/ ticrelated OCD**
- More in males
- Early onset
- Ticlike compulsions:
  - Touching, tapping
  - Repeating, rubbing
  - Symmetry behaviour
- ‘Just-right perceptions’ before compulsions
- Does not respond very well on SSRI; adding a DA improves effect of SSRI

Fibbe, Cath, van Balkom, 2011
Is it a tic (organic) or functional behaviour?
COVID related increase in Childhood Tics and Tic-like Attacks (Heyman et al., 2021; Conte et al, 2020)

- Adolescent girls with sudden onset of tics of a complex and bizarre nature

- 2019 / 2000 : 4-6 referrals per year
- Dec 2020 to Feb 2021: 150-200 referrals
  - Explosive, functional tic-like movements, on a background of diagnosis of, or vulnerability to, motor and phonic tics.
  - Florid, completely new onset tic-like disorder which appears functional
  - Role of social media?
### Differentials Organic tics – Functional tics

<table>
<thead>
<tr>
<th>Feature</th>
<th>Organic tics</th>
<th>Functional tics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age at onset</td>
<td>Childhood</td>
<td>Adulthood</td>
</tr>
<tr>
<td>Gender</td>
<td>More male</td>
<td>More female</td>
</tr>
<tr>
<td>Sudden onset</td>
<td>Rare</td>
<td>Frequent</td>
</tr>
<tr>
<td>Premonitory sensations</td>
<td>Common</td>
<td>Uncommon/atypical</td>
</tr>
<tr>
<td>Suppressible</td>
<td>Yes</td>
<td>Uncommon</td>
</tr>
<tr>
<td>Distractible</td>
<td>Partial</td>
<td>Common</td>
</tr>
<tr>
<td>Suggestible</td>
<td>Partial</td>
<td>Common</td>
</tr>
<tr>
<td>Wax and wane course</td>
<td>Yes</td>
<td>Atypical/paroxysmal</td>
</tr>
<tr>
<td>Localization</td>
<td>More commonly head</td>
<td>Less commonly head/faces (trunk, arms, legs)</td>
</tr>
<tr>
<td>Other (functional/psychiatric) disorders</td>
<td>ADHD, OCS, impulsivity</td>
<td>Pseudoseizures, psychogenic tremor, depression, anxiety, stress</td>
</tr>
<tr>
<td>Family history of TS</td>
<td>Common</td>
<td>Rare</td>
</tr>
<tr>
<td>Anti-tic medication</td>
<td>Positive response</td>
<td>No response</td>
</tr>
</tbody>
</table>


Treatment of tics

- **Behaviour therapy:**
  - Habit Reversal & Exposure therapy

- **Environment**
  - external & internal

- **Brain/physiology**

- **Medication**
  - Deep Brain Stimulation
  - Botox Injections
Behavioural model of tics

- Habit reversal training (HRT; Azrin & Nunn, 1973; CBIT, Woods ea 2008):
  - Treats tics one by one
  - Awareness training
  - Competing response training

  - Targets all tics at once
  - Resisting tics for a long period of time
  - Exposure to premonitory urges
<table>
<thead>
<tr>
<th>Authors</th>
<th>N</th>
<th>Age M (SD)</th>
<th>Interven</th>
<th>pre</th>
<th>post</th>
<th>% improv</th>
<th>Effect size</th>
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<tbody>
<tr>
<td>Wilhelm et al, 2003</td>
<td>32</td>
<td>36.2 (12.7)</td>
<td>HRT ST</td>
<td>30.5</td>
<td>19.8</td>
<td>35.1%</td>
<td>1.50</td>
</tr>
<tr>
<td>HRT &gt; ST</td>
<td></td>
<td></td>
<td></td>
<td>26.6</td>
<td>26.9</td>
<td>-1.1%</td>
<td>-0.03</td>
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<tr>
<td>Verdelien et al, 2004</td>
<td>43</td>
<td>20.6 (12.1)</td>
<td>HRT ERP</td>
<td>24.1</td>
<td>19.7</td>
<td>18.3%</td>
<td>1.06</td>
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<td>HRT = ERP</td>
<td></td>
<td></td>
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<td>26.2</td>
<td>17.6</td>
<td>32.8%</td>
<td>1.42</td>
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<tr>
<td>Deckersbach et al, 2006</td>
<td>30</td>
<td>35.1 (12.2)</td>
<td>HRT ST</td>
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<td>18.3</td>
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<td>3.2%</td>
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<td></td>
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<td>27.7</td>
<td>26.8</td>
<td></td>
<td></td>
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<tr>
<td>Piacentini et al, 2010</td>
<td>126</td>
<td>11.7 (2.3)</td>
<td>HRT ST</td>
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<td>17.1</td>
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<td>1.50</td>
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<td>24.6</td>
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<td>14.2%</td>
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<tr>
<td>Wilhelm et al, 2012</td>
<td>122</td>
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<td>11.5%</td>
<td></td>
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<tr>
<td>Yates et al, 2016</td>
<td>33</td>
<td>12.0 (1.38)</td>
<td>G HRT</td>
<td>29.0</td>
<td>25.6</td>
<td>18%</td>
<td>0.39</td>
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<tr>
<td>Group HRT &gt; PE</td>
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<td>G PE</td>
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<tr>
<td>Rizzo et al, 2018</td>
<td>110</td>
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<tr>
<td>BT &gt; PE</td>
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<td></td>
<td>BT Med</td>
<td>21.9</td>
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<td>0%</td>
<td>39.0%</td>
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<tr>
<td>Rizzo et al, 2018</td>
<td>110</td>
<td>11.2 (2.43)</td>
<td>BT PE</td>
<td>19.7</td>
<td>12.3</td>
<td>37.5%</td>
<td>0%</td>
</tr>
<tr>
<td>BT &gt; PE</td>
<td></td>
<td></td>
<td>BT Med</td>
<td>21.9</td>
<td>21.9</td>
<td>0%</td>
<td>39.0%</td>
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<td>Rizzo et al, 2018</td>
<td>110</td>
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<td>BT PE</td>
<td>19.7</td>
<td>12.3</td>
<td>37.5%</td>
<td>0%</td>
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<tr>
<td>BT &gt; PE</td>
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<td></td>
<td>BT Med</td>
<td>21.9</td>
<td>21.9</td>
<td>0%</td>
<td>39.0%</td>
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<tr>
<td>Nissen et al, 2018</td>
<td>59</td>
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<td>23.4</td>
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<td>Ind comb</td>
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<td>1.21</td>
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<tr>
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<td>11.80 (2.51)</td>
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<td>19.00</td>
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<td>BIP HRT</td>
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<td>Rachamim et al 2020</td>
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<td>iCBIT &gt; WL</td>
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<td>224</td>
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<td>Online ERP&gt;online PE</td>
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<td>12.4 (2.1)</td>
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</tr>
<tr>
<td>Authors</td>
<td>Int</td>
<td>Pre</td>
<td>Post</td>
<td>FU 3mths</td>
<td>FU 6mths</td>
<td>FU 10/12mths</td>
<td>% impro</td>
</tr>
<tr>
<td>---------------------------------</td>
<td>--------------------</td>
<td>-----</td>
<td>-------</td>
<td>----------</td>
<td>----------</td>
<td>--------------</td>
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<tr>
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<td>30.5</td>
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<td>26.9</td>
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<td>Piacentini et al, 2010</td>
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<td>13.9</td>
<td>46.2%</td>
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<td>57.7%</td>
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<td>19.3</td>
<td>18.4</td>
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<td>HRT (16) PE (17)</td>
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<td>30.5</td>
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<td>22.2</td>
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<td>BT (25) MED (47)</td>
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<td>11.44</td>
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<td>23.9</td>
<td>28.4</td>
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<td></td>
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<td>25.0</td>
<td>10.7%</td>
</tr>
</tbody>
</table>

Results at follow-up
European clinical guidelines for Tourette syndrome and other tic disorders—version 2.0. Part II: psychological interventions

Per Andrén1 · Ewgeni Jakubowski2 · Tara L. Murphy3 · Katrin Wolteck4 · Zsanett Tamok2 · Sharon Zimmerman-Brenner5 · Jolande van de Griendt4 · Nanette Mol Debes6 · Paula Viehhaus4 · Sally Robinson7 · Veit Roessner8 · Christos Ganos9 · Natalia Szekjo10,11 · Kirsten R. Müller-Vahl12 · Danielle Cath13 · Andreas Hartmann14,15 · Cara Verdellen17

Received: 9 March 2021 / Accepted: 7 July 2021
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European clinical guidelines for Tourette syndrome and other tic disorders: summary statement

Kirsten R. Müller-Vahl1 · Natalia Szekjo2,12,13,14 · Cara Verdellen3,11 · Veit Roessner10 · Pieter J. Hoekstra1 · Andreas Hartmann16,17 · Danielle C. Cath10,16

Received: 8 March 2021 / Accepted: 19 June 2021
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**Summary statement**

(ECAP, 2021)
Summary statement (ECAP, 2021)
Practice Guideline: The treatment of tics in people with Tourette syndrome and chronic tic disorders


Authors
Tamara Pringsheim, MD, MSc; Yolanda Holler-Managan, MD; Michael S. Okun, MD; Joseph Jankovic, MD; John Pucentini, PhD; Andrea E. Cavanna, MD, PhD; Davide Martino, MD, PhD; Kirsten Müller-Vahl, MD; Douglas W. Woods, PhD; Michael Robinson; Elizabeth Veit Roessner; Maryam Osuoni, MD, MSc

Level B
For people with tics who have access to CBIT, clinicians should prescribe CBIT as an initial treatment option relative to other psychosocial/behavioral interventions.

Level B
For people with tics who have access to CBIT, clinicians should offer CBIT as an initial treatment option relative to medication.

Level C
Clinicians may prescribe CBIT delivered over teleconference or secure voice-over-Internet protocol delivery systems if face-to-face options are unavailable in a patient care center. If CBIT is unavailable, other behavioral interventions for tics may be acceptable, such as exposure and response prevention.
Modalities of Delivery

It also works online - Himle et al., 2010
- Ricketts et al., 2012
- Andren et al., 2019
- Hollis et al., 2021
- Rachmamim et al., 2020, 2022
Modalities of Delivery

- Even without therapists!
  - Haas et al., 2021 (self-help ONLINE-TICS CBIT)
  - Singer et al., 2020 (dvd for parents)
  - Tichelper.com (self-help CBIT website)
  - BT-Coach (app for ERP homework)
Modalities of Delivery

- BT also works in groups
  - Yates et al., 2016
  - Zimmerman-Brenner et al., 2021
  - Nissen et al., 2019
  - Heijerman-Holtgreve et al., 2020
Modalities of delivery

- modified for Child Neurology and Developmental Pediatrics Clinics (Ricketts et al., 2015)
- modified for Occupation Therapist Delivery (Rowe, Yuen & Dure, 2013)
- also works in fewer sessions (Chen et al., 2020)
- also works in shorter sessions (van de Griendt et al., 2018)
- also works if intensified (Blount et al., 2014; Heijerman-Holtgreve et al., 2020)
- also works in younger children (5-8 years old; Bennett et al., 2020)
Recommendations Guidelines

- Start with psycho-education
- Watch and wait?
Psycho-education

For who?
- Patient
- Parents
- Brothers/sisters?
- Other family members/relatives?
- Teachers
- ......

Why?
● Resolve misunderstanding, uncertainty and stigma in TS
● Improve knowledge, attitudes and behaviours
● Help the patient/environment to identify personal strengths
● Provide the child with the tools to explain to others (especially teachers and schoolmates)
● Help to understand the aim and the method of therapy
● Provide educators with general information about TS
Now you know:

- What tics are
- What Tourette Syndrome is
- More about the onset, causes and course of TS
- More about the most common co-occurring conditions
- More about how to differentiate tics from other conditions
- More about the theory and evidence for behaviour therapy for tics

Questions?