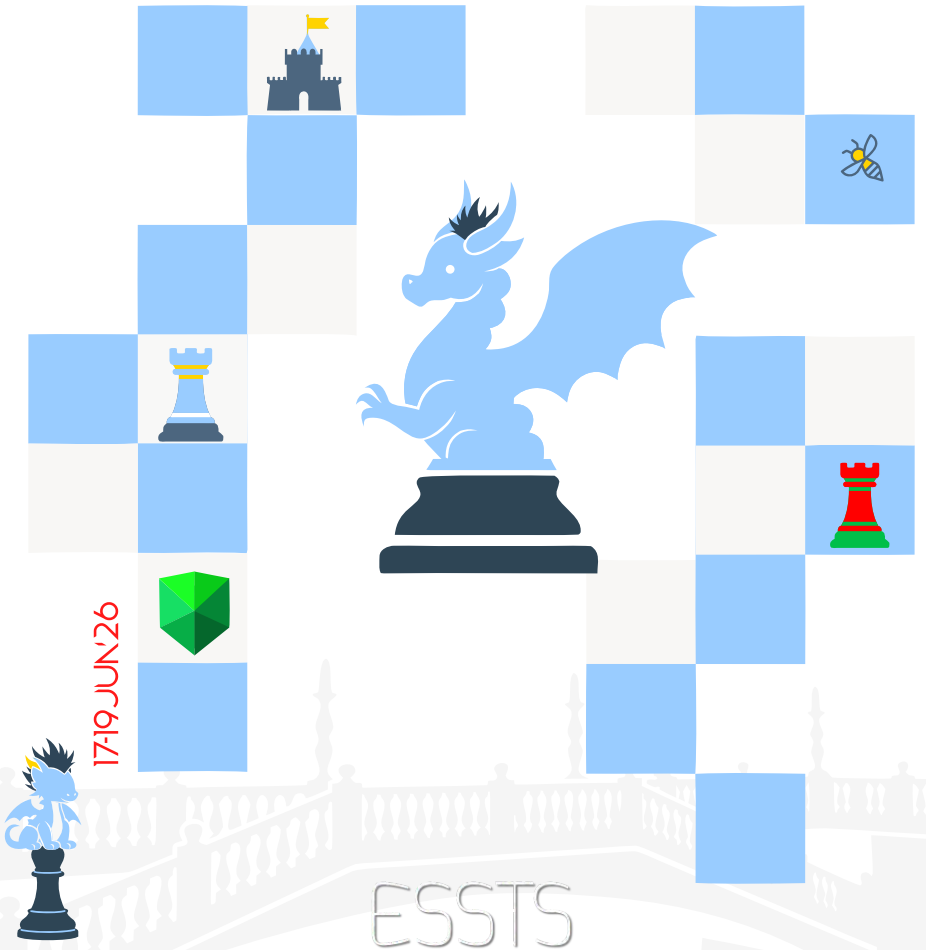
18th International Conference on Tourette Syndrome and Tic Disorders

LJUBLJANA

17-19 June 2026

Grand Hotel Union



ESSTS

European Society for the Study of Tourette Syndrome

is invited!

everyone

European Society for the Study of Tourette Syndrome

Welcome message by the ESSTS Board

Dear colleagues, friends of ESSTS, advocacy groups members, dear sponsors,

It is my privilege, on behalf of the ESSTS Board, to welcome you to the 18th International Conference on Tourette Syndrome and Tic Disorders, here in Ljubljana.

Our society has grown considerably in recent years. While ESSTS remains rooted in Europe, it increasingly draws clinicians, researchers, and advocates from across the world. Each meeting brings new participants alongside the familiar faces who have shaped this field over time, and it is that combination that gives our gatherings the character of a special community.

This year we received the highest number of abstract submissions to date, a clear sign of the momentum within tic disorders research. We are especially encouraged by the strong participation of early-career researchers, whose work will shape the next chapter of the field. Through the sharing of knowledge and the broadening of awareness, we hope to strengthen the support available to individuals and families affected worldwide.

The scientific programme that follows reflects both the depth and the breadth of current work, and the social programme has been designed to leave real room for exchange and collaboration. Ljubljana itself, a city of dragons, riverside bridges, and the architectural vision that still shapes its streets, offers a wonderful setting, and we are grateful to our local hosts for making this gathering possible.

This conference also marks the conclusion of the current Board's term, with new members to be elected during the meeting. It has been a privilege to serve this community alongside colleagues whose dedication has made these years deeply rewarding, and I look forward to seeing ESSTS continue to thrive under fresh leadership.

Welcome message by the ESSTS Board

Our sincere thanks go to our sponsors, whose continued support sustains not only this conference but much of what ESSTS does throughout the year.

We wish you a stimulating, inspiring and rewarding few days; enjoy the Ljubljana conference!

Warm regards on behalf of the ESSTS Board,
Nanette Mol Debes

ESSTS Board 2023-2026

Nanette Mol Debes
Chair

Tammy Hedderly
Vice Chair

Christelle Nilles
Secretary

Natalia Szejko
Treasurer

Kirsten R. Müller-Vahl
Past Chair

Welcome message by the host team

Dear colleagues, dear conference participants,

It is a great pleasure to welcome you to Ljubljana in 2026 for the 18th European Conference on Tourette Syndrome and Tic Disorders, together with its accompanying events – the Tics and Tourette Across the Globe meeting, the TS-school, and the Teachers' Seminar.
Being invited to co-host this event has been a true honour and an opportunity we deeply value.

Slovenia, and Ljubljana as a university city, offers a strong scientific and clinical environment, with many dedicated professionals providing up-to-date diagnostic and treatment options for patients. However, these efforts are not always as well coordinated as they could be to best serve all patients' needs.

Over the years, ESSTS conferences and activities have been an important source of knowledge, professional development, and inspiration for us. In the past fifteen years, we have tried to raise awareness and share knowledge about tics and Tourette syndrome among doctors, psychologists, teachers, patients, their families, and others. Despite these efforts, awareness and understanding remain limited – both among professionals and in the wider public – creating ongoing challenges for individuals with tics and Tourette syndrome and their families. Currently, Slovenia still does not have a formal patient organisation or advocacy group in this field.

For all these reasons, hosting the ESSTS conference and its accompanying events represents a unique and valuable opportunity. It can help advance research and clinical care, strengthen collaboration across disciplines, and raise public awareness about the needs of people with tics and Tourette syndrome. We hope that this year's conference will leave a lasting impact on our local community – improving understanding, enhancing services, supporting teachers, and perhaps even helping to establish a platform for peer support for patients and their families.

LJUBLJANA

Welcome message by the host team

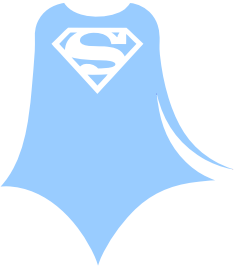
At the same time, the ESSTS conference is a space where scientists, professionals, and individuals with lived experience come together, united by a shared commitment to improving the lives of people with tics and Tourette syndrome. It is also an opportunity to reconnect with colleagues and friends, and to build new collaborations.

Ljubljana in mid-June offers a vibrant and welcoming atmosphere beyond the conference programme. Whether you enjoy relaxing by the river, exploring green parks or open-air cultural events, discovering the city's history, art, and architecture, or experiencing its diverse culinary scene, we hope you will find time to enjoy the city.

We sincerely thank the ESSTS Board members and Anna Kanta for their invitation, trust, and support throughout the preparation of this event. Collaborating with you has already been a rewarding experience.

We wish you a successful and inspiring conference, and a truly memorable stay in Ljubljana.

Jana Kodrič, Jasna Oražem Mrak, Staša Stropnik



Special thank you to Uroš Nović for his support!

Ljubljana

Photo Credits: visitljubljana.com & Grand Hotel Union

A special welcome to our friends and colleagues who are joining us for the first time!

(We apologise if any names are missing, or have been included despite previous attendance!)

Annalise

Victoria

Léa
Lyna

Marija-Magdalena

Pauliina

Cécile
Elodie
Sacha

Christiane
Swetlana
Felix
Shukti

Giulia M.
Giulia S.
Francesco
Sabra
Flavio
Ivan
Vincenzo
Rodrigo

Håkon

Liza

Wiktor

Eva K
Eva Kr.

Vesna
Valentina
Martina
Maja
Barbara

Petra
Špela
Romina
David
Klara
Blanka

Laura

Sam

Marta
Katherine
Tarendeep

Isabella
Hannah
Sarah

Jasmine
Ines
Hafsah

Christine
Gibson

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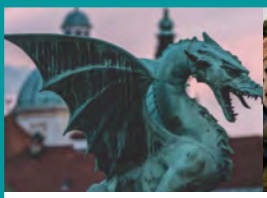




Tics and Tourette Across the Globe

As Tics and Tourette Across the Globe (TTAG) continues to grow its global network, we are proud to once again host a dedicated session at the 18th International Conference on Tourette Syndrome and Tic Disorders.

Wednesday, June 17th, 9:00-17:00

Glass Hall

Our 2026 session, “Tourette Across the Lifespan: Bridging Clinical Practice, Research, and Real-Life Experience” will explore Tourette Syndrome through a comprehensive lifespan lens - from childhood into adulthood. The session brings together clinical insight, research evidence, and lived experience to better understand how tics and associated challenges evolve over time, and how support can be adapted across key life transitions such as education, work, and healthcare.

Lived experience lies at the core of TTAG’s mission and work. It is not a complementary perspective, but the central foundation that informs our priorities, shapes our discussions, and drives meaningful collaboration across all stakeholders.

The session will feature contributions on:

- Lifespan Perspective on Tourette Syndrome
- Understanding Co-occurring conditions and Tourette Syndrome
- Real-life experiences: challenges, obstacles, and the unknown
- Therapeutic approaches across the lifespan: supporting people, not just tics
- AFSGT “Livre Blanc” project: Behind the Tics – Understanding everyday life with TS
- A panel Discussion on Navigating key lifespan transitions
- Supporting families and caregivers through psychoeducation and beyond

We will conclude with a global reflection on Tourette across different contexts, reinforcing TTAG’s commitment to international collaboration, shared learning, and reducing stigma worldwide.

As TTAG continues to evolve, our focus remains clear: strengthening connections between lived experience, clinical practice, and research to improve understanding and support for people impacted by Tourette Syndrome.

We look forward to an engaging, insightful, and collaborative session.

Join TTAG today and support our cause!

TTAG professional membership

TTAG association membership

info@ticsandtourette.org | ticsandtourette.org

Board Elections 2026

The ESSTS Board Elections will take place during this year's conference, with voting open for **24 hours**, beginning at the General Assembly on **Wednesday, 18 June at 13:30**

All active ESSTS members are eligible to vote via our secure, anonymous e-voting system, whether attending in person or not. All eligible members will receive a unique voting link via email when voting opens. If you cannot access the email address associated with your membership account during the conference, please speak to the ESSTS organisers or host team at the registration desk to arrange an alternative email (before the voting begins) or access your personalised QR code.

Four candidates are standing for election across the Chair, Vice-Chair, Secretary, and Treasurer positions for the 2026–2029 term.
In alphabetical order:
Elia Abi-Jaoude (Canada), Laavanya Damodaran (UK), Osman Malik (UK), and Natalia Szejko (Poland).
Detailed candidate statements and CVs, including voting rules and procedures, can be accessed via the QR codes below.

Your participation in this election is vital—every vote shapes the future direction of the ESSTS and ensures that your voice is heard.
Results will be announced at the closing ceremony on **Friday, 19 June**.

Announcement & Candidates

Voting Rules

the MARY ROBERTSON Travel Grants 2026

For the third consecutive year, ESSTS is proud to support junior researchers attending our annual meeting through the Mary Robertson Travel Grants.
We extend our heartfelt thanks to **Professor Mary Robertson** for her continued and invaluable support of young researchers in our field.
This year, we initially announced four grants — but thanks to a generous private donation, we are delighted to have been able to extend this to six awards.

It is our pleasure to introduce the 2026 Mary Robertson Travel Grant winners (in alphabetical order):

- **Méliza Gagnon,** Department of Psychology, Université du Québec à Montréal, Canada
- **Ione Georgakis**, Tourettes Action / Livewell Southwest NHS Trust / Edge Hill University, United Kingdom
- **Annalise Leopold**, Centre for Social and Early Emotional Development and School of Psychology, Deakin University, Geelong, Australia
- **Christiane Licht**, Department of Psychiatry, Psychotherapy and Psychosomatics, RWTH Aachen University, Germany
- **Giulia Maio**, Università Vita-Salute San Raffaele, Milan, Italy
- **Wiktor Śliwiński**, The Independent Public Healthcare Institution of the Ministry of the Interior and Administration in Łódź, Poland

The winners will be invited on stage to receive their certificates at the opening ceremony, on Wednesday, 17 June 2026.
Congratulations to all six!

Poster & Oral Presentations

Vote for best poster & best oral presentation!

The voting platform opens on **Friday 19 June at 12:30** for Oral presentations and at **15:15** for Poster presentations.
A note on eligibility: this year, the best oral presentation award will be open to **junior and early career researchers only**.
Seven of our fourteen oral presentations are delivered by senior colleagues and one of our board members; we feel it would not be a level playing field for early career researchers to compete against established voices.
The best poster award remains open to all presenters.

Listen to the T-playlist!

Scan and listen to the audio presentations recorded by the authors themselves, while you wander around and browse the conference posters.

Poster rounds

The poster rounds this year are scheduled as dedicated programme sessions, no longer woven into the coffee breaks, on **Thursday 18 June, 14:15–15:00** and **Friday 19 June, 14:30–15:15**.
Both sessions take place in the **White Hall**, which will be divided into two spaces hosting parallel rounds: plan ahead which zone you'd like to follow.
Each author has **4** minutes to present their work, with a little room for questions where possible.
Don't miss these sessions, some of the best conversations of the conference happen right in front of the posters!

Fun traditions

7:00 AM Thursday, 18 June*

The morning run tradition continues...

- Destination: Park Tivoli, just a short jog from the hotel. Approximately 5 km at a fun pace, no Olympic sprint, promise!
- Meeting point: in front of the Grand Hotel Union.

Pack your running shoes and join our Chief Track & Field Officer, Nanette Mol Debes, for a fresh start to the conference day.

*Weather & participation permitting, we shall repeat the run on Friday 19 June, direction riverside, along the Ljubljanica!

View route: essts.org/run

Photo Credits: visitljubljana.com

"Dylan" by the Danes

...and so does the song-writing!

Courtesy of our Danish colleagues.

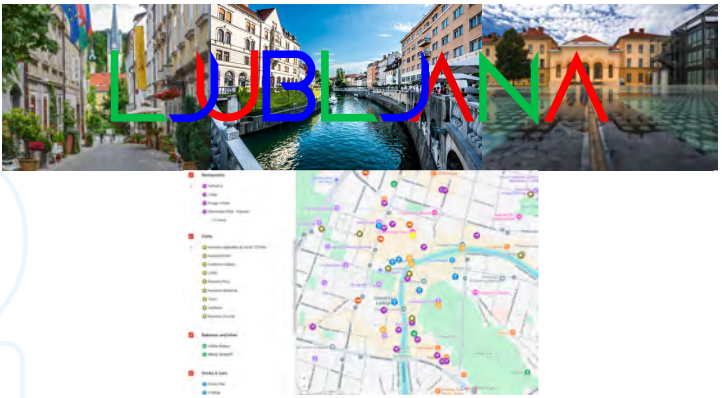
View lyrics: essts.org/song

Good to know

I have a question!

Certificates of attendance? CME credits? Session recordings? Membership? Transport and local "Dos & Don'ts"? We've got you covered!

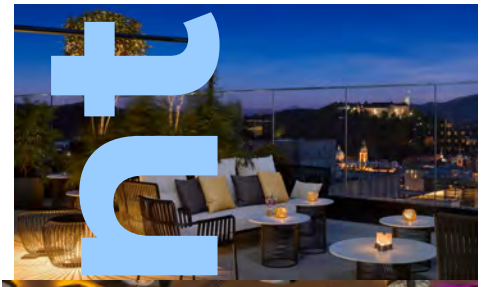
Ljubljana, the local way



Our hosts have curated a custom map-guide featuring their personal picks across the city: restaurants for proper sit-down meals, quick bites between sessions, characterful cafés for that mid-morning espresso, and the sights worth carving out time for — from Plečnik landmarks to the Castle and beyond. Skip the tourist traps and experience Ljubljana's finest, ESSTS-style.

View map (and click on "View map legend):

Photo Credits: visitljubljana.com



Social event & guided tour

B-Restaurant InterContinental

Our social event-dinner takes place on the 20th floor of the InterContinental Hotel, at the B-Restaurant, a panoramic venue with sweeping views over Ljubljana Castle, the Old Town and the surrounding landscape. Doors open from 19:40 CEST. And once dinner winds down, the DJ takes over — for everyone who loved the Athens 2025 dance floor under the stars (you know who you are), bring your dancing shoes!

Master Plečnik's Ljubljana and the Old Town | Guided tour

Continuing our recent museum & cultural tradition reserved for social-event attendees, this year's gift is a guided walking tour of Ljubljana through the lens of Jože Plečnik, the visionary architect whose Triple Bridge, central market, embankments and National Library shaped the modern face of the city, followed by a stroll through the Old Town. The tour begins right outside the Grand Hotel Union Eurostars, on the pedestrian street, at approximately 18:20 — just step out of the venue after the last session of the day.

ESSTS

Conference Programme

Wednesday, 17 June

09:00–12:00

White Hall

Workshop in English for participants with basic training

Trainers: Tara Murphy · Zsanett Tárnok · Jolande van de Griendt · Cara Verdellen · Katrin Woitecki

"Basic principles and behavioural techniques for treating tic disorders"

09:00 – The cornerstone of treatment: diagnostics, assessment and psychoeducation
09:25 – Habit reversal training (HRT)
10:15 – Coffee break
10:30 – Exposure and response prevention (ERP)
11:15 – Function-based interventions
11:45 – Questions and closing – challenges in real life

09:30–10:30

Glass Hall

ENIGMA-TS

Speaker: Peristera Paschou

"Unravelling brain development and genetic background in Tourette Syndrome"

20-minute talk followed by 40-minute discussion / ENIGMA-TS working group meeting.

Moderated by: Kevin Black

11:00–13:00

Tics and Tourette Across the Globe (TTAG)-AM Session

Patient associations and advocacy groups meeting

"Tourette Across the Lifespan: Bridging Clinical Practice, Research and Real-Life Experience"

11:00–11:05 – Welcome – Michele Dunlap, TTAG President, Germany
11:05–11:10 – Welcome – Nanette Mol Debes, ESSTS Chair, Denmark
11:10–11:40 – "Lifespan Perspective on Tourette Syndrome" – Mauro Porta, Italy
11:40–12:10 – "Understanding Co-Occurring Conditions and Tourette" – Christine Conelea, USA
12:10–12:15 – Break
12:15–13:00 – Interactive Session: "TS in Real Life – Challenges, Obstacles and the Unknown" – Maria Belen Prieto, TTAG Board, Spain

13:00–14:00

Garden hall

Light lunch

14:00–17:00

White Hall

Workshop in English for advanced participants

Trainers: Tara Murphy · Zsanett Tárnok · Jolande van de Griendt · Cara Verdellen · Katrin Woitecki

"OCD and tic-related OCD"

14:00 – Quiz
14:10 – Introduction, background & assessment of tics, OCD and tic-related OCD
14:30 – Treatment overview including sequencing of treatment
14:55 – Systemic approach (school, work)
15:10 – Neurobiology & update on medication 15:25 – Coffee Break
15:45 – Case discussions in smaller groups

14:00–17:00

Glass Hall

Tics and Tourette Across the Globe (TTAG) Annual Meeting- PM session

14:00–14:30 – "Therapeutic Approaches Across the Lifespan – From Symptom Management to Life-Centered Care" – Roxana Apollonio Cabrera, TTAG Vice President, Spain
14:30–14:40 – Preview: AFSGT Project "Livre Blanc" – Jean-François Mittaine, France
14:40–15:50 – Expert Panel Discussion: "Navigating Lifespan Challenges"

- Kirsten Müller-Vahl, Germany
- Christine Conelea, USA
- Elia Abi-Jaoude, Canada
- Sam de Boer, The Netherlands
- Maria Belen Prieto, TTAG Board, Spain

15:50–16:00 – Coffee Break
16:00–16:45 – Presentation & Interactive Session: "Supporting Families and Caregivers – Psychoeducation and Beyond" – Donatella Comasini, TTAG Board, Italy
16:45–17:00 – Key Takeaways & Goodbye till 2027 – Roxana Apollonio Cabrera and Michele Dunlap, TTAG

Opening ceremony

18:00–19:45

Glass Hall

I. Keynote

Speaker: Barbara J. Coffey

"Tourette Disorder: Tears, Fears and Years"

The role and impact of anxiety and depression in TS, with recent data on suicidality.

Lecture (45') followed by discussion (15')

Moderated by: Tammy Hedderly

II. Professor Mary Robertson Award 2026

Speaker: winner to be revealed!

Oral presentation (15')

Moderated by: Natalia Szejko

III. Mary Robertson Travel Grant winners

Annalise Leopold-Australia, Méliza Gagnon-Canada, Ione Georgakis-UK, Christiane Licht-Germany, Giulia Maio-Italy, Wiktor Sliwinski-Poland

(in alphabetical order)

19:45

Garden Hall

Cocktail time; getting together again!

Thursday, 18 June

07:00

Tivoli Park

Morning run

The morning run tradition continues — pack your running shoes!

Chief Track & Field Officer: Nanette Mol Debes.

09:00–09:15

Glass Hall

Welcome address by Tics and Tourette Across the Globe (TTAG)

Speaker: Michele Dunlap

09:15–10:30

Glass Hall

Symposium session on OCD

I. Neuroplasticity in OCD: lifespan changes and treatment targets

Speaker: Odile van den Heuvel

II. Advanced treatment strategies for OCD

Speaker: Philippe Domenech

III. Focus on clinical aspects

Speaker: Osman Malik

10:15–10:30 Q&A – discussion

Moderated by: Nanette Mol Debes

10:30–11:00
Garden Hall
Coffee break

11:00–12:30
Glass Hall
Clinical rounds - case (video) presentations

Session Chair: Tammy Hedderly

12:30–13:30
Garden Hall
Lunch break

13:30–14:15
Glass Hall
General Assembly | Thank you for participating!

Board elections: 2026–2029 term

eVoting available for members not attending in person.

14:15–15:00
White Hall
Poster rounds, session I

Moderated by: Nanette Mol Debes (P1-P13) & Jana Kodrič (P14-P24)

15:00–15:30
Garden Hall
Coffee break

15:30–16:15
Glass Hall
Complementary medicine in tic disorders: a scoping review
Speaker: Tamara Pringsheim

Moderated by: Christelle Nilles

16:15–16:45
Glass Hall
Pharmacotherapy for tics: past & future
Speaker: Kirsten Müller-Vahl

Moderated by: Christelle Nilles

16:45–18:00
Glass Hall
Oral presentations of submitted abstracts, session I

Moderated by: Andreas Hartmann

Social activities

18:15
Guided Tour
"Old town & Plečnik's Ljubljana"

From 19:45
InterContinental Rooftop Restaurant
Social Event-Dinner

Friday, 19 June

09:00–10:45
Glass Hall
Pathophysiology session

I. Animal models of Tourette syndrome

Speaker: Marco Bortolato

II. Biomarker of tic prognosis

Speaker: Yulia Worbe

III. Pathophysiological insights from the EMTICS study

Speaker: Andrea Dietrich

10:30–10:45 Q&A – discussion

Moderated by: Kirsten Müller-Vahl

10:45–11:15
Garden Hall
Coffee break

11:15–12:30
Glass Hall
Oral presentations of submitted abstracts, session II

Moderated by: Kirsten Müller-Vahl

ESSTS

12:30–13:30

Garden Hall

Lunch break

13:30–14:30

Glass Hall

Controversy session, followed by a live poll

"Is coprolalia a tic or functional?"

Speaker: Kirsten Müller-Vahl

Arguing "No, it is not a tic"

Speaker: Elia Abi-Jaoude

Arguing "Yes, it is a tic"

Moderated by: Tammy Hedderly

14:30–15:15

White Hall

Poster rounds, session II

Moderated by: Nanette Mol Debes (P25-P36) & Jana Kodrič (P37-P48)

15:15–15:45

Garden Hall

Coffee break

15:45–16:45

Glass Hall

Best papers of 2025 on tics and TS

Speaker: Kevin J. Black

Moderated by: Andreas Hartmann

16:45–17:15

Glass Hall

Closing ceremony

Best poster & best oral presentation awards

New ESSTS Board announcement

ESSTS Conference 2027 announcement

Table of Contents (Abstracts)

Mary Robertson Award Winner 2026

Reduced sensory attenuation reflects altered motor control in Tourette Syndrome

Giulia Stanco[1], Angela Marotta[2], Marika Mariano[1], Mauro Porta[3] and Laura Zapparoli[1,3]

1 Psychology Department and NeuroMI - Milan Centre for Neuroscience, University of Milano-Bicocca, Milan, Italy; 2 Department of Neurosciences, Biomedicine and Movement, University of Verona, Verona, Italy; 3 IRCCS Ospedale Galeazzi Sant'Ambrogio, Milan, Italy

Background:
Tourette Syndrome (TS) is a neurodevelopmental disorder defined by motor and phonic tics, often preceded by uncomfortable somatic sensations (i.e., premonitory urges). Increasing evidence suggests that abnormal sensorimotor integration may contribute to these symptoms (Rae et al., 2019). Within predictive coding models, the brain is thought to generate internal predictions that help distinguish self-produced from external sensations. This mechanism involves sensory attenuation (SA), whereby the sensory consequences of voluntary movements are down-weighted through forward model predictions (Blakemore et al., 1998). We investigated whether this process is altered in TS, as a possible physiological marker of impaired sensorimotor filtering, and whether the magnitude of this alteration is associated with the clinical severity of the syndrome.

Methods:
Thirty adults with TS and thirty healthy controls (HC) performed a Force Matching Task (Shergill et al., 2003). Participants first experienced a target force on one finger and then attempted to reproduce it either directly, by pressing with the other finger (Direct condition), or indirectly, via a button controlling a motor (Indirect condition).
We calculated the SA Index, computed as the ratio between the applied force and the target force. An SA Index > 1 indicates force overestimation, while a value closer to 1 indicates accurate perception. We analysed the effect of Group (HC vs TS) and Condition (Direct vs Indirect) on the SA Index using a 2x2 mixed-design ANOVA and explored the correlation between the SA Index and the severity of motor symptoms (Yale Global Tic Severity Scale, YGTSS).

Results:
We observed a significant Condition*Group interaction ($F(1,58)=12.1$, $p<.001$). Bonferroni-corrected post-hoc tests showed that the between-group difference in SA was specific to the Direct condition: HC displayed the expected physiological attenuation (SA Index=1.34), whereas TS patients showed reduced attenuation, resulting in more veridical force reproduction

(SA Index=1.12; p=.039). No group difference emerged in the Indirect condition (p=.49). The SA Index in the Direct condition correlated negatively with the YGTSS Total Tic Score (r=–0.49, p=.006), whereas no correlation was found in the Indirect condition (r=–0.20, p=.28), indicating that this link is exclusive to the Direct condition.

Conclusions:
Our findings provide the first empirical evidence of altered SA in TS. Patients exhibited a "hyper-accurate" perception of self-generated forces, suggesting a deficit in the forward model's ability to down-weight reafferent sensory information. This supports the hypothesis of "hyper-precise priors" in TS (Rae et al., 2019), where the brain fails to predictively cancel out internal signals. The significant correlation with the tic severity suggests that this physiological deficit is directly linked to the phenotypic expression of the disorder: reduced SA may therefore represent a neurophysiological marker of abnormal sensorimotor integration in TS.

Oral presentations of selected abstracts

O1. Behavioral inflexibility and impulsivity are associated with explosive outbursts in youth with Tourette syndrome

Simon Morand-Beaulieu[1,2], Méliza Gagnon[1,2], Julie B. Leclerc[1,2]

1 Département de psychologie, Université du Québec à Montréal, Montréal, Canada; 2 Centre de recherche du Centre intégré universitaire de santé et de services sociaux du Nord-de-l'Île-de-Montréal, Montréal, Canada

Background:
Several children with Tourette syndrome (TS) experience recurrent episodes of sudden and intense anger, commonly referred to as explosive outbursts. Nevertheless, individual characteristics influencing the onset of such outbursts remain poorly understood. In adults, impulsivity has been identified as a risk factor for explosive outbursts, but evidence is currently lacking in children. Additionally, behavioral inflexibility, which is conceptualized as a pattern of rigid, inflexible behavior in situations where it would be beneficial to adapt one's behavior to external demands, constitutes a trigger for anger outbursts in other neurodevelopmental conditions. However, its role in TS has not been studied yet. Therefore, the aim of this study was to assess whether impulsivity and behavioral inflexibility, as well as their interaction, were associated with explosive outbursts.

Methods:
Three hundred and seventeen (317) parents of children (aged 6-14, 74.8% male) living with TS were asked to complete a series of questionnaires

hosted on the Qualtrics platform. Parents completed the Behavioral Inflexibility Scale (BIS), the short-version of the UPPS-P Impulsivity Inventory, the Parent Tic Questionnaire (PTQ), and the Rage Attack Questionnaire-Revised (RAQ-R) to assess behavioral inflexibility, impulsivity, tic severity, and explosive outbursts, respectively. Parents also reported on their child's sociodemographic and clinical characteristics, including co-occurring diagnoses (e.g., ADHD, OCD, autism) and psychoactive medication use.

Results:
Parent-rated behavioral inflexibility and impulsivity were significantly associated with explosive outbursts, as assessed with the RAQ-R. However, their interaction was not a significant predictor of explosive outbursts. Exploratory analyses revealed a small but significant association between tic severity and explosive outbursts. In terms of co-occurring diagnoses, more severe explosive outbursts were only found in youth with co-occurring internalizing disorders, learning disorders, and sleep problems. Explosive outburst severity was not associated with sex nor age.

Conclusions:
Explosive outbursts are highly detrimental to the individual and familial functioning. Identifying risk factors for explosive outbursts is important given that it may lead to new targets for interventions aiming to decrease the frequency and intensity of explosive outbursts. Our results revealed that behavioral inflexibility and impulsivity constitute such risk factors. These traits appear to contribute to explosive outburst severity beyond the presence of co-occurring neurodevelopmental and mental health conditions, highlighting their transdiagnostic relevance. These findings underscore the importance of assessing these traits when evaluating emotional dysregulation in TS.

O2. Executive functioning and explosive outbursts among youth with Tourette syndrome

Simon Morand-Beaulieu[1,2]

1 Department of Psychology, McGill University, Montréal, Canada ; 2 Département de psychologie, Université du Québec à Montréal, Montréal, Canada

Background:
Explosive outbursts, which are sudden, intense episodes of anger triggered by trivial events, affect an important proportion of youth with Tourette syndrome (TS). However, predisposing factors of explosive outbursts remain poorly understood. Recent work has shown that behavioral inflexibility, which is a tendency to behave rigidly in situations requiring flexibility, constitutes a strong predictor of explosive outbursts in TS. Furthermore, prior work in TS

has shown some slight impairments in some executive functions, such as inhibitory control or cognitive flexibility. However, it is unclear whether executive difficulties could lead to explosive outbursts. The current study aimed to investigate whether explosive outbursts in youth with TS are better explained by cognitive inflexibility, as assessed through neuropsychological tasks, or by behavioral inflexibility derived from parent-report questionnaire. We also explored broader associations between executive functioning (response inhibition, interference control) and explosive outbursts.

Methods:
Fifty-three (53) children with TS participated in the current study. First, their parents were asked to complete sociodemographic and clinical questionnaires hosted on the Qualtrics platform. They completed the Behavioral Inflexibility Scale (BIS), the Rage Attack Questionnaire-Revised (RAQ-R), and the Parent Tic Questionnaire (PTQ). Children were then asked to complete the short-version of the UPPS-P Impulsivity Inventory and to perform three experimental tasks hosted on the Inquisit plaform: the Wisconsin Card Sorting Test (WCST), the Hearts and Flowers task, and a Go/NoGo task.

Results:
Behavioral inflexibility was significantly associated explosive outbursts, whereas cognitive inflexibility, as indexed by perseverative errors on the WCST, was not associated with explosive outburst severity. There were also no significant associations between explosive outbursts and interference control or response inhibition. Exploratory analyses revealed that higher parent-rated tic severity was associated with poorer interference control, as assessed with incongruent reaction times during the Hearts and Flowers task.

Conclusions:
Our findings suggest that explosive outbursts in youth with TS are more strongly linked to behavioral rigidity than to performance on executive functioning tasks. Neuropsychological measures of cognitive flexibility, interference control, and response inhibition were not associated with explosive outburst severity. This suggests that classical neuropsychological tests may not capture the processes underlying explosive outbursts. Also, the measures used in the current study assessed cold executive functions, which are emotionally neutral cognitive processes. Given that explosive outbursts are inherently emotional events, they may be driven more strongly by hot executive functions, which involve information processing and regulation associated with emotion or motivation.

O3. Sleep Patterns in Children with Tic Disorders: Distinct Profiles by Tic Subtype rather than Diagnosis Alone

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Background:
Sleep is one of the key protective factors in human health and is particularly important to children with neurodevelopmental disorders, such as chronic or transient tic disorders. This study performed an exploratory analysis comparing sleep behaviors in children with and without tics from a general population sample.

Methods:
Children (n = 593) taking part in the Copenhagen Prospective Studies on Asthma in Childhood (COPSAC) cohort study were psychiatrically assessed for tics and comorbidities at age 10. Children were screened using the Kiddie Schedule for Affective Disorders and Schizophrenia (KSADS) and those fulfilling the ICD-10 criteria were assigned a research diagnosis as appropriate. Participants wore accelerometers for 14 days at age 10 and at age 13. Time of sleep onset, sleep duration, number of nighttime awakenings, and total minutes awake after sleep onset were extracted from the accelerometer devices. A series of univariate linear models assessed the relationship between the sleep behavior domains and psychiatric variables.

Results and Conclusions:
Of the 593 participants, 30 were diagnosed with a tic disorder (8 participants with Tourette Syndrome, 14 participants with Persistent Tic Disorder, and 8 participants with Transient Tic Disorder). Participants at age 13 had later bedtimes and slept less on average than they did at age 10 (mean = 11:06pm (SD = 1.46 hours) vs. mean = 9:53pm (SD = 1.31 hours), $p < 0.001$) (mean = 7.22 hours (SD = 1.23) vs. mean = 7.73 hours (SD = 1.15), $p < 0.001$). Sleep behaviors in participants with tics generally resembled their healthy peers. When looking at subtypes of tic disorders, participants with Transient Tic Disorder had fewer nighttime awakenings than healthy controls (mean = 18.85 awakenings (SD = 5.17) vs. mean = 21.18 awakenings (SD = 5.05), $p < 0.05$) but still received less total sleep than their healthy peers (mean = 8.41 hours (SD = 1.4) vs. mean = 8.83 hours (SD = 1.33), $p < 0.05$). Participants with Persistent Tic Disorder trended toward having an earlier bedtime than controls (mean

= 9:59pm (SD = 1.37 hours) vs. 10:21pm (SD = 1.5 hours), p = 0.066), although this did not reach conventional levels of significance. Likewise, when sleep behaviors were assessed based on how many neurodevelopmental comorbidities a participant had, there were no relationships between comorbidity burden and any measured sleep domain.

Our results suggest that diagnosis alone does not necessarily predict sleep problems in children with tics. A further look at the mediating role of tic severity, tic impairment, and time since diagnosis may add explanatory power. To our knowledge, this is the first study using actigraphy to examine the relationship between tic disorder types and sleep patterns in children from the general population. Extended sleep monitoring was feasible in this group, supporting the use of actigraphy to assess naturalistic sleep patterns in children with tics and to detect group differences. The evidence that sleeping patterns may diverge between children with and without tics highlights the importance of assessing sleep patterns even in non-clinical samples. Taken with previous evidence that there is a mismatch between objective sleep quality and subjective sleep quality in patients with tics, the results support examining children with tics both on a diagnosis-to-diagnosis basis and on an individual basis to assess the risk of sleep problems.

O4. Prevalence and Phenomenology of Pain in Children and Adolescents with Tourette Syndrome: Findings from a Tertiary Tic Service

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Background:
Pain is frequently reported by individuals with Tourette syndrome (TS), yet it remains under-recognised in clinical assessment and research. Estimates suggest that 47–60% of individuals with TS experience pain, a rate considerably higher than that observed in the general population (Green et al., 2025). Pain may arise directly from tic expression (Riley & Lang., 1989; Margo., 2002; Taylor et al., 2022), through repetitive musculoskeletal strain (Anderson et al., 2019), or indirectly from sustained efforts to suppress tics (Riley & Lang., 1989). Additionally, many individuals report discomfort associated with premonitory urges preceding tic expression (Cohen & Leckman., 1992). Primary pain syndromes such as migraines are also greater in the TS population than the general paediatric population (Ghosh et al., 2012; Kwek et al., 2003). Recent work has proposed a classification framework describing five domains of tic-related pain: immediate tic-related

pain, delayed tic-related injury/pain, suppression-related pain, premonitory urge-related pain, and associated primary pain syndromes (Green et al., 2025). Systematic data describing these experiences in paediatric clinical populations remain limited.

Methods:
Participants comprised 106 children and adolescents who attended an initial assessment at the Great Ormond Street Hospital Tic Service between January and December 2025. Pain experiences were explored using structured clinical questioning informed by the five-domain classification framework (Green et al., 2025). Carers provided additional historical information where appropriate. Tic severity was assessed using the Yale Global Tic Severity Scale (YGTSS). Descriptive analyses examined demographic characteristics, tic severity, and the prevalence of different pain categories.

Results and Conclusions:
Delayed tic-related injury or pain (e.g. repetitive stress injury) was the most frequently reported category (51.9%). Immediate tic-related pain (e.g. musculoskeletal/joint pain) was reported by 30.2% of participants, while associated primary pain syndromes (e.g., headaches or migraines) were reported by 32.1%. Suppression-related pain was reported by 11.3%, and premonitory urge-related pain by 3.8%. Many patients reported pain in multiple domains. Of the 106 participants assessed, 95 received a primary diagnosis of TS. Mean age at assessment was 12 years, with mean age of tic onset at 6 years. According to YGTSS severity categories, 46.2% were classified as mild, 32.1% moderate, and 21.7% severe. Autism spectrum condition (n=37) and ADHD traits (n=27) were common comorbidities. Overall, pain was reported by over half of the cohort, by 56% of males and 53% of females seen by the service.
Pain is a common and multifaceted feature of paediatric TS, with musculoskeletal pain resulting from repetitive tic movements being most common. These findings highlight the need for systematic assessment of pain in routine clinical evaluation of tic disorders. Improved recognition of pain may inform more comprehensive treatment approaches and support the development of targeted pain management strategies within multidisciplinary tic services.

O5. Autism and Attention-Deficit/Hyperactivity Disorder Traits as Predictors of Tic Phenomenology in Children and Adolescents

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Background:
The co-existence of neurodevelopmental conditions such as autism and attention deficit/hyperactivity disorder in tic disorders is recognised as a key factor influencing clinical decision-making. Given the shared clinical features and a potentially overlapping aetiology, the need to identify specific tic characteristics associated with autism and attention deficit/hyperactivity disorder remains. The current study subsequently sought to identify tic phenomenology uniquely predicted by autism and attention deficit/hyperactivity disorder traits in children and adolescents.

Methods:
Data from 473 5-16-year-olds from the 2004 British Child and Adolescent Mental Health Survey with motor and/or vocal tics were used. Regression analyses were conducted to determine the effect of autism and attention deficit/hyperactivity disorder traits on: (i) the presence of motor and/or vocal tics, (ii) tic onset age, (iii) nocturnal tic expression, (iv) self-regulatory control over tic expression, (v) tic frequency during restful/low arousal state, and (vi) rebound tic activity post-suppression, before and after adjustment for confounders.

Results:
Autism is associated with earlier onset of tics by approximately 2.43 years. Attention deficit/hyperactivity disorder traits are associated with a 2.64x odds of experiencing worsening tics following periods of suppression. Neither autism or attention deficit/hyperactivity disorder traits were specifically associated with motor and/or vocal tics, self-regulatory control over tic expression, nocturnal tic expression or tic frequency during restful/low arousal states.

Conclusions:
Comorbid neurodevelopmental traits not only co-occur with tic disorders but actively shape their clinical expression and trajectory. Clinically, earlier support for autistic children with tics may facilitate a timely intervention, whereas intervention plans for individuals with attention deficit/hyperactivity disorder traits should account for heightened vulnerability to tic rebound post suppression.

O6. Effects of wrist-administered vibrotactile stimulation on tic symptoms in young people with Tourette syndrome: a mixed-methods pilot study

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Background:
There are effective evidence-based treatments for tics, but these often come with side effects or require significant motivation and commitment to achieve results, so there is still a need to explore new treatment approaches. A potential option is vibrotactile stimulation (VTS), a form of non-invasive peripheral nerve stimulation whereby mechanical vibrations applied to the surface of the skin activate mechanoreceptors and evoke neural responses. VTS has been used to reduce unwanted movements Parkinson's disease (PD), and the overlap in brain dysfunction between PD and TS gives reason to believe that VTS could be effective for TS, but there is no known published research addressing this.. In neurotypical controls, VTS activates the parasympathetic nervous system, reducing heart rate and skin conductance. Research indicates little to no adverse events, suggesting it is an acceptable, low risk intervention. This exploratory study aimed to test the possible effect of VTS on tic frequency, severity and the urge to tic, as well as assess the acceptability and feasibility of such research.

Methods:
This study employed a within-subject repeated-measures design with three timepoints: pre-, during-, post-stimulation. 17 young people aged 12-18 with moderate to severe TS were given 15 minutes of wrist administered VTS whilst their tics were video recorded. The frequency and severity of tics in this period were compared to the 15 minutes before and after stimulation. The Premonitory Urges for Tourette Syndrome (PUTS) scale was also used at each time point. Subsequent qualitative interviews were conducted to explore the subjective experience of the intervention and inform future research.

Results and Conclusions:
Total tic frequency was analysed using a negative binomial mixed-effects model, with timepoint as a fixed effect and participant as a random intercept. Incidence rate ratios indicated that the group average tic frequency significantly decreased by 36% during stimulation compared to baseline (IRR = 0.64, 95% CI: 0.52–0.78, $p < 0.001$). 65% of participants exhibited a clinically significant reduction (defined as reduction >25%) in their total tic frequency during stimulation compared to baseline. There was also a 18% decrease between pre- and post-stimulation that just reached significance, (IRR = 0.82, 95% CI 0.66–0.997, $p = 0.047$).
The group averages for tic severity and premonitory urges were analysed using linear mixed-effects models. A significant reduction in premonitory

urges was also seen (β = −4.94, 95% CI −6.65 to −3.23, p < 0.001) which was maintained in the post-stimulation window. Average tic severity also significantly decreased from baseline to during stimulation (β = −3.26, 95% CI −4.88 to −1.64, p < 0.001) however, this reduction was not maintained post-stimulation. Qualitative data suggested that the VTS helped individuals feel more relaxed and reduced the urge to tic, with no reported unpleasant effects. Participants generally found the device comfortable to use and reported that they would want to use it again in other settings to provide relief from their tics.
This exploratory pilot study suggests that VTS could be an acceptable and effective intervention for the symptoms of TS. Further work establishing the mechanism of action, and repeating stimulation for a longer period and in larger samples with a broader range of tic severity are the planned next steps.

O7. Beyond tics: The impact of explosive outbursts on family functioning in Tourette syndrome

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Background:
Approximately 50% of children with Tourette syndrome (TS) experience explosive outbursts. These outbursts are marked by sudden, disproportionate episodes of verbal or physical aggression, accompanied by a sense of loss of control. Their intensity, unpredictability and recurrence distinguish them from typical temper tantrums. As these episodes occur primarily at home and require active parental management, they may have important implications for the overall functioning of the family. Parents often perceive explosive outbursts as among the most disruptive aspects of TS, yet their impact on family functioning remains unclear. The aim of this study was to assess whether explosive outburst severity predicts impairment across different dimensions of family functioning: problem solving, communication, role distribution, affective responsiveness, affective involvement, behavior control, and general functioning.

Methods:
A total of 289 parents of youths with TS aged 6 to 14 years (M = 10.6; 75% boys) completed an online battery of questionnaires. A background questionnaire was used to gather sociodemographic and clinical information, including the child's comorbid conditions. Tic severity was assessed using the Parent Tic Questionnaire (PTQ), explosive outburst severity using the Rage Attack Questionnaire–Revised (RAQ-R), and family

functioning dimensions using the Family Assessment Device (FAD). Hierarchical regression analyses were conducted, controlling for comorbid conditions and tic severity, to evaluate the unique contribution of explosive outburst severity to each family functioning dimension.

Results and conclusions:
Explosive outburst severity significantly predicted impairments in problem solving, role distribution, behavior control, and general functioning. These findings suggest that explosive outbursts have a broad impact on family life, while also affecting core organizational processes and the family's ability to maintain consistent behavioral standards across situations. In contrast, explosive outburst severity did not significantly predict impairments in affective responsiveness, affective involvement, and communication. These findings suggest that the episodic and non-deliberate nature of these outbursts, driven by loss of control rather than intentional aggression, may limit their impact on affective dimensions, and that families may preserve typical interaction patterns outside of outburst episodes. Comorbid conditions and tic severity were not significant predictors of any family functioning dimension. Taken together, these results highlight the unique impact of explosive outbursts on family functioning and underscore the importance of targeting specific family processes in interventions for families of youth with TS.

O8. Sex differences in the expression of explosive outbursts in youth with Tourette syndrome

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Background:
In typically developing children, the scientific literature reports sex differences in the expression of temper tantrums. Children with Tourette syndrome (TS) exhibit sudden and intense anger outbursts that are disproportionate to their triggering stimulus. These manifestations are referred to as explosive outbursts and differ from typical temper tantrums on several dimensions, notably in their recurrent, unpredictable, and excessive nature relative to the triggering stimulus. Explosive outbursts appear to be more prevalent in boys than in girls. A study conducted in an adult population with TS found no difference in the mean severity of explosive outbursts between men and women. However, no study to date has examined sex differences in the expression of explosive outbursts among youth with TS. The present study aims to examine sex differences in

(1) the frequency, intensity, and severity of explosive outbursts; (2) their targets (objects, classmates, friends, siblings, parents, other family members); and (3) the environments (home, school) in which they occur.

Methods:
A total of 304 parents of youth aged 6 to 14 years with TS completed an online sociodemographic questionnaire, along with selected items from the Rage Attack Questionnaire and the full Rage Attack Questionnaire–Revised. We used an independent samples t-test to analyze the severity variable and the nonparametric Mann-Whitney U test to analyze the other variables.

Results and Conclusions:
No sex differences were observed across the (1) frequency, intensity, and severity of explosive outbursts; (2) their targets; and (3) the environments in which they occur.
The absence of sex differences contrasts with findings from studies on temper tantrums in typically developing children, where the expression of anger varies by sex. This suggests that explosive outbursts are not merely an intensification of typical temper tantrums, but rather a distinct phenomenon associated with TS. Temper tantrums appear to be shaped by socialization processes, with traditional masculine norms linked to more overt expressions of aggression, whereas traditional feminine norms are more associated with indirect forms of aggression in accordance with social expectations. However, the present findings could suggest that explosive outbursts are not shaped by these processes, since no sex differences were observed, reinforcing the notion that explosive outbursts are distinct from typical temper tantrums. Accordingly, the intervention associated with these episodes may differ from those typically targeted in temper tantrums.

O9. Substance misuse in adults with Tourette syndrome

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Background:
Data on substance use disorders (SUD) in adults with Tourette syndrome is limited, although a high prevalence is suspected and associated with adverse

health consequences. Our objectives were to estimate prevalence of problem use and SUD in adults with tics and explore the association between SUD and mental health comorbidities, demographic variables and tic severity.

Methods:
From our Adult Tic Registry in Canada (Calgary) and France (Paris, Poitiers, Limoges, Strasbourg, Clermont-Ferrand, Nantes, Marseille), we used data from the Tobacco, Alcohol, Prescription medication, and other Substance use (TAPS) Tool -part II for substance use screening. SUD was considered possible if the TAPS score was ≥2 for alcohol, tobacco, and cannabis. For other drugs (cocaine/crack/methamphetamine, heroin, sedatives, ADHD medication, opiates, recreational drugs), a threshold score of ≥1 was used to define problem use. We investigated associations between possible SUD/problem use and age, sex, nationality, presence and severity of psychiatric comorbidities and tic severity. Multivariable logistic regression models were developed to predict each SUD.

Results:
A total of 248 adults with chronic tic disorders were included (mean age: 32.3 years; 61.7% males; 40.3% Canadian, 59.7% French). Overall, 51 participants (33.5%) screened positive for at least one SUD, involving alcohol (15.7%), tobacco (14.5%) or cannabis (8.1%), with no significant differences between men and women. Up to 9.3% of participants screened positive for sedatives-related problem use. French Nationality was associated with substantially lower odds of cannabis SUD (OR = 0.17, p=0.008); higher depression scores were associated with increased odds of cannabis SUD (OR=1.16, p=0.047), as was greater tic severity (OR=1.09, p=0.026). In the multivariable logistic regression models: Canadian nationality was the only significant predictor of alcohol SUD (p<0.001); tic-related impairment (OR=0.95, p=0.0077) and tic severity (OR=1.07, p=0.014) were significantly associated with tobacco SUD; and age was the only variable significantly associated with sedatives-related problem use (OR≈1.05, p=0.040).

Conclusions:
A substantial proportion of adults with tic disorders screened positive for SUD and therefore require further diagnostic assessment. Clinicians should pay particular attention to cannabis SUD, as individuals using cannabis -possibly for self-medication- exhibit more severe psychiatric symptoms and tics. They should also be aware of sedatives-related problem use, which may be underestimated in routine care.

O10. A neural basis for premonitory urge and tic suppression

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Background:
A defining characteristic of Tourette syndrome (TS), and one that distinguishes it from other kinds of movement disorder, is that tics can often be suppressed. However, tic suppression is invariably associated with increasing levels of discomfort, which is most often experienced as a strong urge-to-tic, referred to a premonitory urge (PU). Furthermore, it is argued that primarily PU arise due to the act of suppression, much like the sensation experienced when we actively suppress a yawn or suppress blinking. Previous accounts have proposed that the urge-for-action involves a network of brain areas comprising the anterior insula, the mid-cingulate cortex (MCC) and the mid-insula, and that this circuit is common to a range of behaviours, including the urge-to cough, the urge-to-yawn, the urge-to-tic in TS, and the urge-to-blink (which has often been investigated as a proxy for the urge-to-tic in TS. We used functional MRI (fMRI) and low-intensity focused ultrasound stimulation (LIFUS) together with a blink-suppression paradigm to investigate the functional anatomy of the urge-to-blink.

Results and Conclusions:
fMRI results: continuously recorded subjective estimates of the urge-to-blink were shown to increase during periods of successful blink suppression and immediately decreased when a blink occurred. This is consistent with reports that ticking brings relief from PU.
Blink suppression was associated with activation in the dorsolateral prefrontal cortex (DLPFC), cerebellum, right dorsal-anterior insula, mid-cingulate cortex (MCC) and thalamus. This finding is consistent with previous reports implicating the DLPFC in inhibition of action and linking the anterior insula and MCC to the urge-to-tic.
Finally, subjective urge-to-blink scores were correlated with fMRI BOLD activity in the right posterior and ventral-anterior insula, as well as the MCC and occipital cortices, implicating these areas in the subjective experience of the urge-to-blink.
LIFUS results: LIFUS to the anterior insula induced a clear and acute increase in blink frequency without altering urge. This confirms the putative role of this area in voluntary action control. LIFUS to the posterior insula induced delayed increases in both blinks and urge. Ventricular stimulation (control condition) unexpectedly reduced blink frequency during the stimulation. This was shown to be correlated with acoustic energy delivered to the posterior internal capsule which may be a promising target for therapeutic stimulation.

In summary, these findings provide correlational and causal evidence for the potential role of the insula in tic suppression and the urge-to-tic

O11. Changes in self-esteem and quality of life following CoPs or CBIT therapy in youth with tics – Do tic-specific traits influence psychosocial outcomes?

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Background:
Tourette syndrome and chronic tic disorder are associated with significant psychosocial challenges beyond tic severity, particularly in self-esteem and quality of life, due to stigma and unpredictability of symptoms. Cognitive-behavioral therapies, notably *Comprehensive Behavioral Intervention for Tics* (CBIT), are recommended as first-line treatments. However, a substantial proportion of youth continue to experience impairing symptoms. The *Cognitive Psychophysiological* (CoPs) approach provides an alternative by targeting underlying mechanisms such as sensorimotor hypersensitivity and tic-specific cognitive traits. While both therapies reduce tic severity, their impacts on psychosocial outcomes remain unclear, as does the role of tic-specific traits in shaping treatment response. This study aimed to compare the effects of CBIT and CoPs on quality of life and self-esteem and examine whether tic-specific traits (action planning style, impulsive perfectionism) predict treatment-related changes in these outcomes.

Methods:
A total of 59 participants were randomized to receive 12-14 weekly 60-minute sessions of CBIT or CoPs, with 49 completing post-treatment psychosocial measures (CBIT = 25, CoPs = 24). Participants had a mean age of 9.92 years and 70.6% identified as male. Assessments were conducted at baseline, post-treatment, and six-month follow-up. Both treatments were delivered individually. Primary outcomes included quality of life and self-esteem, while secondary outcomes included action planning style and impulsive perfectionism. ANCOVAs were used to examine treatment effects on primary outcomes, and multiple regression models examined whether tic-specific traits predicted changes in primary outcomes.

Results:
No significant differences between groups were observed in quality-of-life scores at post-treatment or follow-up. A non-significant trend toward higher

self-esteem at post-treatment was observed in the CBIT group ($p = .06$, $\eta p^2 = .10$). Tic-specific traits (action planning style and impulsive perfectionism) did not significantly predict changes in primary outcomes. Post-hoc power analysis indicated sufficient power to detect medium effects.

Conclusions:
Both CBIT and CoPs yielded comparable, modest improvements in quality of life, with a transient post-treatment benefit on self-esteem for CBIT, which was not maintained at follow-up. Tic-specific traits did not predict changes in psychosocial outcomes, suggesting limited influence on treatment response. Overall, findings indicate that psychosocial functioning in youth with tic disorders are shaped by broader emotional and contextual factors beyond tic severity. These findings highlight the importance of complementing symptom-focused interventions with approaches that promote positive mental health and enhance self-esteem. Clinically, both interventions appear to be comparable treatment options with similar psychosocial benefits.

O12. When Comorbidity Matters: How Anxiety and Depression Shape Cognitive Functioning in Gilles de la Tourette Syndrome

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Background:
Tourette syndrome (TS) is a multifaceted neurodevelopmental disorder often linked with psychiatric comorbidities, particularly anxiety and depression, which can influence neuropsychological functioning. This study aimed to assess inhibition, motor dexterity, visuospatial skills, and non-verbal memory in adults with TS, and to examine the specific impact of anxious and depressive comorbidity. It is hypothesized that individuals with TS who also have anxiety and/or depression will exhibit significantly different levels of inhibition, motor dexterity, and visuospatial abilities compared to both neurotypical individuals and clinical groups without comorbidities.

Methods:
A total of 128 participants were divided into three groups: TS with comorbid anxiety and/or major depression (TS+, n = 21), TS without significant comorbidity (TS–, n = 37), and neurotypical controls (n = 70), all matched for age, sex, and IQ. Participants completed the Stroop Color Word Test (inhibition), Purdue Pegboard Test (motor dexterity), and Rey–Osterrieth

Complex Figure (visuospatial abilities and non-verbal memory). Repeated measures MANCOVAs were applied with medication status as a covariate. A stepwise discriminant function analysis were also applied including all variables at entry.

Results:
Results showed no significant differences between groups on the Stroop interference index, indicating preserved inhibitory control across TS subgroups. Conversely, both TS– and TS+ participants exhibited better motor dexterity compared to controls. The most notable finding involved visuospatial skills and nonverbal memory: only the TS+ group displayed deficits on ROCF copy and delayed recall, while TS– participants performed similarly to controls. Discriminant function analysis confirmed that visuospatial processing and nonverbal memory best distinguished TS+ from TS–, whereas motor and processing speed distinguished both clinical groups from controls.

Conclusions:
These results highlight that the comorbidity of anxiety and depression in TS specifically impacts visuospatial ability and memory functions, emphasizing the importance of assessing these conditions when interpreting neuropsychological profiles in TS.

O13. Bridging Diagnostic Gaps and Increasing Awareness of Emerging Therapies in Tourette Syndrome Through Web-Based CME

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Background:
While advances in Tourette Syndrome (TS) neurobiology have identified potential novel therapeutic targets beyond dopamine D2 receptor antagonism, gaps remain in diagnosis, treatment selection, and longitudinal management. We evaluated the impact of a multi-format continuing medical education (CME) curriculum designed to improve diagnostic accuracy, clinical recognition, and understanding of evolving therapeutic strategies in TS.

Methods:
A two-part online CME curriculum covering diagnostic differentiation, disease burden, limitations of current therapies (Activity 1), and emerging agents

(Activity 2) launched in November 2025. The program included long-form videos supplemented with targeted microlearning distributed to US-based, NPI-verified pediatricians, pediatric psychiatrists, and neurologists (intended learners). Pre- and post-activity knowledge and competence questions assessed impact, with cohort analysis of intended learners and chi-square comparison of pre–post responses ($p<0.01$).

Results and Conclusions:
As of March 2026, 12,463 clinicians (93% of whom were intended learners) participated in at least one educational component (1,481 long-form, 10,982 microlearning). Significant improvements in knowledge and competence were observed: from 44% to 81% in Activity 1 and from 43% to 60% in Activity 2. The greatest gains (>40%, $p<0.01$) were seen in diagnosis, clinical recognition, and understanding of TS pathophysiology. Moderate improvements (>30%, $p<0.01$) were observed in knowledge of emerging therapies. Smallest gains (~30%, $p<0.01$) were noted in treatment decision-making and understanding of disease burden. Planned practice changes included increased application of TS guidelines (61%), modification of treatment approaches (35%), and adjustment of pharmacologic strategies (21%). Notably, 42% indicated intent to consider selective D1 receptor antagonists for patients inadequately responsive to behavioral therapy.
This large-scale, multi-format CME initiative targeting pediatricians, pediatric psychiatrists, and neurologists enhanced clinicians' foundational understanding of TS and improved diagnostic knowledge and competence. Persistent gaps in treatment sequencing and integration of emerging therapies highlight an opportunity for similar educational formats to further improve clinical management. (The CME education was supported by an unrestricted grant from Emalex Biosciences).

O14. Behavioral, Clinical, and Cognitive Predictors of Tic Suppression

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Background:
Despite the involuntary nature of the disorder, numerous studies support the long-standing clinical observation that environmental and behavioral factors (both internal and external) can significantly impact tic frequency and severity. The factors involved in behavioral suppression, however, are not well known. One potential factor that has not been well studied, particularly in youth, is the role of directed attention in tic suppression.
Utilizing a behavioral suppression paradigm with manipulation of directed attention, the goals of the present study were to characterize behavioral and

cognitive correlates of successful suppression ability within among children with and without Chronic Tic Disorder (CTD). Blink suppression was used an analogue to tic suppression among children without CTD. A second goal of the study is to examine the effect of directed attention on tic suppression among children with CTD.

Methods:
ORBIT's translational pathway spans three linked studies. First, a large randomised The sample consisted of 131 children, including 91 with CTD and 41 typically developing children (TDC), ages 8-14 years old. All participants underwent diagnostic interviews, cognitive testing, behavioral suppression tasks in one 3-4 hour session. Parent rated behaviors on tics (YGTSS, PUTS, CYBOCS), clinical (CBCL, Conner's ADHD scale, and cognitive (BRIEF were collected. There were three suppression conditions: 1. tic or blink freely/no suppression (NoSupp), 2. verbal instruction for tic/blink suppression (VSupp), and 3. tic/blink suppression for reward (RSupp). There were two directed attention conditions: 1. children were instructed to focus solely on their blinks/tics and try to suppress as many as possible (AttnTo); 2. children were instructed to think solely about flanker task performance in order to obtain a reward (AttnAway). Percent decrease of tics and blinks from the NoSupp to VSupp/RSupp and AttnAway were used to quantify differences between conditions and analyzed to identify predictors of better behavioral suppression.

Results and conclusions:
First, the CTD and TDC groups did not differ in terms of the percent decrease from NoSupp to either of the two suppression conditions (p's >.5) Good suppression ability (i.e., larger percent decrease in tics/blinks) was associated with better behavioral functioning (i.e., lower scores) on the CBCL Social Problems, Delinquent Behaviors Externalizing and Total Problem scores and the CPRS Hyperactive/Impulsive scores (all p's <.05). Higher scores on the BRIEF subscales: Shift, Emotional Control, and Inhibit were significantly associated with percent decrease in blinks/tics (all p's <.05). There were no significant associations between the YGTSS, CYBOCS, or PUTS within the CTD group.
In the directed attention analyses, the mean percent decrease in tics from tic freely was 37% (SD=30.6) and 45% (SD=32.1; p<.05) in attention toward without and with reward, respectively and 73% (SD=33.2) during the attention directed away condition (p<.001).
Overall, these results suggest that good suppression ability was predicted by better behavioral, clinical, and executive functioning, but no differences on measures of tic severity, premonitory urge or obsessive-compulsive symptomatology. The results also suggest that directing attention away from rather than towards tics was a more successful strategy for tic suppression.

O15. Parent-Rated Functional Impairment Over Time in Youth with Tic and Other Movement Disorders: A Preliminary Electronic Health Record Study

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Background:
Functional impairment is a clinically meaningful outcome in youth with tic disorders, yet longitudinal real-world data remain limited. Co-occurring diagnoses may contribute importantly to impairment in children with tics and other movement disorders.

Method:
To examine the association of movement disorder diagnostic category and psychiatric comorbidity with parent-rated functional impairment over time in youth followed in a pediatric movement disorders clinic, we conducted a retrospective longitudinal study using electronic health record data from the Cincinnati Children's Hospital Medical Center Movement Disorders Clinic. Records from 1/1/2022 through 12/31/2025 were abstracted. Patients were eligible if they were 5-25 years old and had at least 2 visits during the study period with parent-rated, movement-related functional impairment recorded. Primary neurologic diagnoses were abstracted and collapsed into 3 categories: Tic Disorders, Tremor Disorders, and Other Movement Disorders. Psychiatric comorbidity was also abstracted and collapsed into binary indicators for presence or absence of any anxiety disorder and/or obsessive-compulsive disorder (OCD). All families completed an intake questionnaire on a tablet, imported into the electronic health record for point-of-care use. The questionnaire includes the impact of movements (visit to the emergency department [ED], homeschooling, pain, injury), use of mental health services (psychiatrist, psychologist, therapist), and parental assessment of comorbid conditions (attention-deficit/hyperactivity disorder [ADHD], and anxiety/OCD). Functional impairment was based on the mini-Child Tourette Impairment (CTIM) Scale, which includes 14 questions rating the degree of impairment in the child's function at home, school, and in social settings. The primary outcome is change in CTIM. Preliminary analyses summarize cohort composition and comorbidity patterns; longitudinal impairment modeling is in progress.

Results:
Preliminary findings show that patients in the Tic Disorders category (n=349) had higher odds of an anxiety disorder diagnosis than patients with tremor disorders (n=78) or other movement disorders (n=155) (combined odds ratio

3.4, 95% CI 2.3-5.0). Final analyses will evaluate whether movement disorder category and presence of co-occurring anxiety/OCD moderate change in impairment across visits.

Conclusions:
In this preliminary report, tic disorders appear to be strongly associated with co-occurring anxiety relative to other pediatric movement disorder diagnoses. This finding supports the clinical relevance across pediatric movement disorders of incorporating psychiatric comorbidity assessment into models of functional impairment over time. Final longitudinal analyses will clarify whether anxiety/OCD are associated with different impairment trajectories across diagnostic groups.

Poster session I

P1. Evidence for a developmental delay in brain maturation in Tourette syndrome: a multi-centre mega-analysis of TMS data

The BigTic MRC International Research Partnership:
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Background:
Tourette syndrome (TS) is associated with cortical-striatal-thalamic-cortical circuit dysfunction and often follows a developmental time course in which tics become increasingly more controlled during adolescence. This indicates that there may be important differences between adults with TS, for whom the clinical phenotype is more stable, and that children and adolescents with TS may undergo developmental neuroplastic changes linked to the reduction of their tics. Furthermore, it has been proposed that adolescents with TS may exhibit a developmental delay in brain maturation.
Previous studies have used transcranial magnetic stimulation (TMS) to investigate changes in cortical motor excitability in individuals with TS, including measurement of resting motor threshold (RMT). However, the findings from these studies have been mixed, have varied between adult and child samples, and have often been based to small sample sizes. Here we report a multi-centre, international, mega-analytic study in which RMT data

collected from children and adults with TS at multiple research centres was pooled for analysis.

Results and Conclusions:
The results from this study confirmed that mean RMT was significantly increased in individuals with TS compared to neurotypical controls. However, this finding can be explained by: (a) RMT for adults with TS does not differ from that of neurotypical adults; and (b) the rate that RMT decreases with age during childhood and adolescence is reduced in individuals with TS compared to controls. Thus, while neurotypical individuals reach an adult RMT level relatively quickly (by ~14.3 years of age), individuals with TS are substantially delayed in doing so, and do not reach an adult RMT level until much later, at ~23.8 years of age.
We conclude that differences in measures of cortical excitability between children and adolescents with TS and chronologically age-matched neurotypical controls may likely reflect a developmental delay in the maturation of functional brain networks in individuals with TS, which may nonetheless normalise with age.

P2. The experiential bases of the urge to tic in Tourette syndrome: Study protocol and preliminary qualitative findings

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Background:
Approximately 90% of individuals with Tourette syndrome (TS) over the age of 10 report pre tic experiences (referred to as premonitory urge). Nonetheless, they remain difficult to articulate, given they are inherently private and inaccessible to external observation. Early qualitative descriptions acknowledged the phenomenon but struggled to capture its variability and experiential nuance. Subsequent research and clinical models have largely characterised its sensory-somatic qualities, commonly likened to an itch or internal pressure, often assessed using self-report measures. Current first line behavioural interventions for children with TS require patients to identify the pre tic experience as a therapeutic prerequisite. However, effective and safe treatment depends on an accurate and comprehensive characterisation of the pre tic phenomenon itself.

Methods:

We present the protocol for the *NHMRC*-funded study '*Urge-to-tic: Examining the neural and experiential bases of Tourette syndrome*' (U-TIC TS; 2025 to 2027), a multimodal investigation of premonitory urge in an Australian community-based sample of children and adolescents with TS. The study integrates structural and functional MRI, real-time urge monitoring during tic suppression, and a blink suppression paradigm to examine the generalisability of urge-related mechanisms to natural bodily urges, and to characterise these processes relative to healthy controls. Micro-phenomenological interviewing is used to elicit fine-grained descriptions of lived pre tic experiences, enabling systematic analysis of the experiential structure of the premonitory urge beyond metaphor or proxy measures. Here, we present preliminary qualitative findings, in which experiential descriptions have been organised into emergent thematic patterns and clusters. The protocol additionally includes a pre–post Comprehensive Behavioural Intervention for Tics (CBIT) component designed to evaluate whether intervention modifies subjective urge intensity and associated neural activity.

Results and Conclusions:
Preliminary findings from the micro-phenomenological component (n = 10 adolescents) indicate that the urge cannot be reduced to simple sensory analogies such as an itch. Rather, it emerges as heterogeneous and multidimensional, encompassing embodied sensations (tension, headaches, internal discomfort), emotional and cognitive load (exhaustion, annoyance, self-consciousness), and, for most, an inner dialogue between the person and urge. These latter experiential dimensions are only partially captured by existing rating scales. By integrating neural measures with structured investigation of lived experience, U-TIC TS aims to advance a more comprehensive and developmentally grounded model of the pre-tic experiences in TS.

P3. The premonitory urge revisited: a linking pin with autism spectrum disorders and ADHD?

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Background:
Premonitory urges (uncomfortable cognitive or bodily sensations such as tension,
pressure, and tickling sensations that often precede the execution of a tic)[1], are regarded as core symptoms in most children and adults with tic disorders. These sensations develop during tic development, with prevalence

rates up to 80% in adults[2]. These urges seem to be comparable to sensations that are experienced in other neurodevelopmental (ND) disorders including ASD and ADHD[3]. Hypersensitivity to both internal and external sensory stimuli and the individuals' inability to tolerate them across tic[4;5] and other ND disorders[6,7,3] is well documented, potentially leading not only to tics but also to repetitive behaviors in ND disorders. The aim of this talk is to explore the potential shared cognitive and neurobiological basis of premonitory urges in tics and other ND disorders. Additionally, we aim at reviewing literature in other ND on treatment of urges and hypersensitivity to internal and external stimuli, to learn on possibilities to apply this when treating TD.

Methods:

We searched the literature using Medline and Psychinfo, focusing on premonitory urges in TD, ASD and ADHD, with the following research questions: 1) what are the working mechanisms and neurobiological underpinnings of hypersensitivity to internal and external stimuli across ND disorders? 2) Can we identify shared working mechanisms on how hypersensitivity to internal and external stimuli lead to tics and other restrictive and repetitive behaviors across neurodevelopmental disorders? 3) Can we identify treatments that work to attenuate premonitory urges instead of the current practice in tic treatment in which we merely support patients to tolerate them?

Results and Conclusions:

We identified shared patterns of altered neural and sensorimotor processing across TD and other ND disorders, including ASD and ADHD, which we will discuss in the lecture. Individuals with TD, ASD and ADHD often show hypersensitivity to internal and external stimuli, as well as difficulties in habituating to these sensations. Regarding treatment, the literature suggests that current behavioural interventions including CBIT and ERP may influence the experience of urges through inhibitory and instrumental learning, rather than through habituation[8]. With respect to treatments that potentially attenuate sensory phenomena, we will discuss the potential of "sensory-motor retraining"[9].

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P4. Neural responses to reward are associated with anger in youth with Tourette syndrome

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Background:
Children with Tourette Syndrome (TS) often experience explosive outbursts, which are intense and uncontrollable anger reactions triggered by minor events. However, the brain activation patterns associated with these outbursts remain poorly understood. Research on attention deficit hyperactivity disorder, which frequently co-occurs in TS, has shown that enhanced irritability was associated with increased reward-related electrophysiological activity. This study examined whether electrophysiological measures of reward responsiveness were associated with feelings of anger in youth with TS.

Methods:
EEG was recorded in 67 children (38 TS, 29 typically developing controls; TDC) aged 10-14 years old while they performed the Doors task, a common paradigm to assess reward responsiveness. In this task, participants must select one of two doors presented on a computer screen, after which they are told whether they won or lost money. Time-frequency principal component analysis was used to isolate feedback-locked delta and theta oscillations, which have been shown to be sensitive to reward. We also computed the reward positivity (RewP). Anger reactions were assessed with the Children's Inventory of Anger (ChIA), a self-report measure of anger feelings in hypothetical situations.

Results:
Children with TS reported higher ChIA scores than TDC. Greater delta responses were significantly associated with higher ChIA scores. There was also a significant interaction between group and ChIA total scores, such that the association with delta was only significant for children with TS. RewP

and theta were not significantly related to ChIA, though effects were in the same direction.

Conclusions:
Our findings suggest that increased reward-related delta is associated with enhanced feelings of anger in youth with TS. This is consistent with prior reports of enhanced reward responsiveness being associated with irritability in children with neurodevelopmental and mental health conditions. In conclusion, these findings provide preliminary evidence that the reward system functioning may contribute to explosive outbursts.

P5. Neurocognitive correlates of response to cognitive and behavioral treatment in youth and adults with Tourette syndrome

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Background:
Behavioral therapies, such as Comprehensive Behavioral Intervention for Tics (CBIT), and cognitive-behavioral therapies, such as cognitive-psychophysiological (CoPs) therapy, are well-established treatments for tics in children and adults. However, the cognitive mechanisms underlying treatment response remain poorly understood. Prior research has yielded inconsistent findings, namely regarding the role of inhibitory control as well as other neurocognitive domains. Our study aimed at investigating whether baseline neurocognitive functioning predicted or moderated treatment outcome following CBIT or CoPs, and whether cognitive performance changed differentially across treatment modalities.

Methods:
Seventy-four (74) children and adults with TS participated in a randomized controlled trial comparing CBIT and CoPs. Thirty-six (36; 14 females) participants were allocated to CBIT and 38 (13 females) were allocated to CoPs. Both treatments were delivered individually by licensed psychologists trained in a single modality, in weekly 60-minute sessions over 12 to 14 weeks. Participants were assessed with a comprehensive neurocognitive battery at baseline and endpoint. The assessment battery included tests assessing intellectual and executive functioning, visuospatial abilities, visual memory, processing speed, and motor dexterity. Treatment outcome was

defined as change in total tic severity on the Yale Global Tic Severity Scale (YGTSS).

Results:
Baseline neurocognitive functioning did not predict treatment response for either CBIT or CoPs, and no measure of executive functioning or motor dexterity emerged as a treatment-specific predictor. Only immediate recall performance on the Rey-Osterrieth Complex Figure moderated treatment outcome, such that lower immediate recall scores were associated with greater tic reduction in participants receiving CoPs. Across the whole sample, cognitive performance on several measures improved from baseline to endpoint. However, no time by treatment interactions were observed for any cognitive measure, indicating no differential impact of treatment modalities on cognition.

Conclusions:
These results suggest that standard neurocognitive measures offer limited utility in predicting response to behavioral or cognitive-behavioral therapies in TS. It also appears that CBIT and CoPs lead to comparable changes in cognition over the course of treatment. Changes in neurocognitive measures should be interpreted cautiously, as they may reflect treatment effects, practice effects, or developmental influences. Overall, our results are consistent with the current state of the scientific literature on cognition in TS where only subtle differences in neurocognitive test performance are generally reported, with more important differences being attributable to co-occurring conditions. Future work should leverage more sensitive neurocognitive measures to better understand the mechanisms of behavioral and cognitive-behavioral therapies.

P6. Characterizing premonitory urges in Tourette Syndrome

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Background:
Premonitory urges (PU) are sensory phenomena that precede tic execution and tend to decrease following tic occurrence. Despite their clinical relevance, PU remain less explored than tics. Current literature emphasizes the importance of subjective PU sensations, PU anatomical localization and PU spatial overlap with tics. To date, clinical studies regarding the specific local overlap between PU and their corresponding tics remain limited.

Methods:

A cross-sectional observational study was conducted on a sample of 47 subjects (Mean age ± SD = 22.4 ± 18.14; 24 females, 23 males) with a confirmed TS diagnosis. Data collection followed an ad-hoc protocol, addressed to patients or their parents, for minors, in telemedicine or face-to-face with a psychologist. Spatial overlap was measured using a specialized digital body mapping tool. Participants were required to identify and select pre-defined anatomical regions corresponding to both their most subjective impairing tics and their perceived PU. This tool allowed for a precise one-to-one anatomical correlation between each specific tic and its preceding urge. Overlap was quantified through the Jaccard Index, calculated as the ratio of the intersection of areas activated by both PU and tics and their union. Subjective urge perception and subjective tic inhibition capacity were assessed, as well, through the protocol.

Results and Conclusions:
Results indicated that when considering tics and PU as two separate variables, tics were significantly more widespread and involved a higher number of activated anatomical regions than PU ($p = .043$). A distinct topographical distribution was observed, with PU showing a significantly higher concentration in the anterior versus posterior regions of the body ($p = .001$). The head and neck areas emerged as the primary "hotspots" of both PU and tics, showing the highest degree of their spatial convergence. On the contrary, other regions, such as the flanks, were identified as the sites of the lowest shared activation. The analysis of the subjective urge perception resulted in a significant internal consistency among three items (alpha = .803): frequency, sensory intensity, and anticipatory awareness, pooled in a “composite urge score” by the study researchers.
A moderately positive correlation emerged between the “composite urge score” and the Jaccard Index ($Rs = .363$, $p = .013$), suggesting that a stronger subjective perception of the urge is associated with a higher spatial intersection between the PU and the tics’ sites. A further analysis of the three items characterised additional features of the PU structure. While the three items (pooled in the “composite urge score”) are related to the degree of spatial overlap, only anticipatory awareness, i.e. the ability to perceive the urge before the tic, showed a significant association with the participants' perceived ability to inhibit tics.
These findings provide evidence of a spatial link between PU and tics, supporting a spatially anchored sensorimotor model. The data suggest that the relation between PU and tics follows a specific topographical mapping rather than a diffuse activation. In relation to tic inhibition, the role of anticipatory awareness implies that the subjective detection of these localized signals is a relevant factor in the individual's experience of symptoms control. In conclusion, this study provides a framework aimed at elucidating the relationship between premonitory urges and tics, within a sensory-motor perspective in Tic Disorders.

P7. Experimental Investigation of the Effects of Rhythmic Movement Transmission on Tic Frequency in Tourette Syndrome: Horse Simulator vs. Therapy Horse

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Background:

For individuals with Tourette syndrome, tic symptoms represent both a somatic and a psychological burden. Clients and providers of equine-assisted interventions report that riding leads to a reduction in tics and thus significantly improves well-being. The rhythmic transmission of movement from the horse's back to the person riding is assumed to be a contributing factor.

Methods:

This study investigates, in a controlled experimental setup, whether a rhythmic movement experience leads to a reduction in tics, and whether these effects are observed in the same way sitting on a horse simulator as riding a therapy horse. Ten participants with Tourette syndrome were included in the experiment, which used a crossover within-subjects design. The following conditions were investigated:

- five minutes of sitting on a horse simulator moving at a walking pace
- five minutes of sitting on a therapy horse being led at a walk

The analysis included tics counted by a person trained in tic observation, between minutes 3 and 5 of the total measurement time. All participants first completed the control condition, in which they sat on a stationary stool. The total sample was randomly divided into two groups before data collection. Thus, 5 participants were examined on the horse simulator (JOBA brand) as the first experimental condition, and 5 participants began with the experimental condition on the therapy horse (crossover). Ten participants (female=2, male=8) were included, 9 participants were between 9 and 14 years old, and one participant was 45 years old. All participants had a medically confirmed diagnosis of Tourette syndrome. Regarding the tic profile, 7 of the participants exhibited predominantly vocal and motor tics, while 3 participants presented exclusively with motor tics. Information on previous therapies indicated that 4 participants were taking neuroleptic medication, and 7 participants had previously received behavioural or movement therapy. 8 participants had little to no prior riding experience, while 2 had regular riding experience. Tic frequency was recorded using hand-held counters under the three conditions, following the protocol of the Modified Rush Video-Based Tic Rating Scale – R. In the control condition, 2 of the 10 participants showed a tic frequency of < 10 tics in the first 2 minutes. These participants were presented with a stressor, namely solving arithmetic problems, in both experimental conditions. The analysis was performed once

for the entire sample and once for the subsample reduced by these two participants.

Results and Conclusions:
For the total sample (N=10), a significant decrease was found between the two experimental conditions (p = .017, d = 0.92) and between the control condition and the therapy horse condition (p = .006, d = 1.12). For the subsample (n=8) a carry-over effect (for the four participants who completed the therapy horse condition prior to the horse simulator) was observed (p = .013, d = 1.16). The results demonstrate a reduction in tics through rhythmic movement transmission to the whole body when the movement is transmitted from a real horse. The fact that the effect on the horse simulator was not significant suggests that, in addition to the purely motor component of movement transmission by the therapy horse, other factors support tic reduction. Here, regulatory mechanisms from equine-assisted therapy that affect the heart rate and respiration of the individuals could play a role.

P8. Clinical and qEEG Correlates of Tic Severity and Short-Term Outcome in Pediatric Tic Disorders: A Prospective Study

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Background:
Tics are involuntary, sudden, rapid, and recurrent movements or vocalizations that may impair daily functioning and quality of life. They typically emerge in childhood and often improve during adolescence, although they may persist or worsen in approximately 20% of cases. Tic disorders, including Tourette syndrome, are associated with dysfunction in cortico–striato–thalamo–cortical circuits and are frequently present with comorbid ADHD and OCD. Electroencephalography (EEG), particularly quantitative EEG (qEEG), provides insight into brain dynamics and may help identify neurophysiological patterns related to tic generation and specific symptom dimensions.

Methods:
This prospective, single-center observational study investigated the relationship between qEEG parameters, clinical phenotype, and short-term outcome in children and adolescents with tic disorders. Twenty-nine patients (aged 3–18 years) were consecutively recruited and assessed at baseline (T0) and follow-up (T1). Clinical measures included the Yale Global Tic Severity Scale (YGTSS), Premonitory Urge for Tics Scale (PUTS), Children's

Yale-Brown Obsessive Compulsive Scale (CY-BOCS), and Clinical Global Impression-Severity (CGI-S). At baseline, patients were clinically evaluated and either assigned to pharmacological treatment, initiated after the visit (n=10), or to no treatment (n=19). Resting-state EEG recordings (eyes closed) were obtained prior to treatment initiation, and qEEG metrics—including theta/beta ratio (TBR), alpha peak frequency (APF), spectral power, and mean frequency—were analyzed.

Results and Conclusions:
At baseline, patients assigned to treatment exhibited significantly higher clinical severity than untreated patients (YGTSS: 40.8 vs 16.4, $p<0.001$), while no significant differences were observed across most qEEG parameters. Over time, tic severity significantly improved (mean YGTSS reduction ~57%, $p=0.007$), and 34.5% of patients met criteria for clinical response. Baseline clinical severity emerged as the strongest predictor of improvement, with significant correlations between ΔYGTSS and baseline YGTSS (rho=0.740, $p<0.001$), motor tic severity (rho=0.798, $p<0.001$), and CGI-S (rho=0.582, $p=0.007$). While qEEG parameters were not associated with global tic severity and did not independently predict clinical outcome, when considering specific symptom dimensions, premonitory urges showed a trend-level association with beta activity at sites P3 and C3 ($r=0.355$, $p=0.059$), and alpha peak frequency (APF at Fz) showed potential prognostic relevance in multivariable models. Age was also significantly associated with qEEG measures, reflecting expected neurodevelopmental patterns. While qEEG markers were not directly linked to global tic severity or short-term outcome in this sample, these findings should be interpreted with caution. The observed associations with premonitory urges and APF suggest that qEEG may capture specific symptom dimensions and developmental processes rather than overall tic burden. Further studies with larger cohorts are warranted to better define the clinical utility of qEEG in predicting outcomes in tic disorders.

P9. Premonitory Urge Network in Patients with Tic Disorders

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Background:
Premonitory urges (PU) preceding tic execution are a core feature of tic disorders and are thought to reflect altered sensory processing. However, the functional brain networks underlying PU and their relationship to tic severity remain poorly understood.

This study aims to identify a PU-related functional network in patients with tic disorders and to examine its association with urge severity, tic severity and tic-related functioning.

Methods:
Age-matched groups of 33 patients with tic disorders and 23 control subjects (mean age 28.29. ± 8.95 years) underwent MR imaging on a 3T scanner and were clinically phenotyped. Tic severity was assessed using the Yale Global Tic Severity Scale (YGTSS global score: 42.32 ± 14.49; impairment: 22.00 ± 10.04). Premonitory urges were quantified using the Premonitory Urge for Tics Scale (PUTS score: 26.22 (±5.01). A composite urge score was calculated by combining PUTS and visual analogue scale (VAS, 1-10) for urge severity (composite urge score: 32.86 ±5.20).

Results and conclusions:
Resting-state fMRI data were analyzed using independent component analysis and bootstrap resampling to identify a premonitory urge related network pattern (PURP). This network included three independent components: 1) a bilateral occipito-temporal component, 2) frontal-parietal component and 3) a sensorimotor/basal ganglia component.
PURP expression scores were significantly correlated with the composite PU score ($r = 0.50$, $p = 0.003$). Furthermore, PURP network subject scores were significantly correlated with the YGTSS total score ($r = -0.41$, $p = 0.017$) and YGTSS impairment score ($r = -0.34$, $p = 0.05$). Furthermore, higher PURP scores were correlated with global functioning (GAF; $r = 0.43$, $p = 0.013$) and self-reported awareness of autonomic nervous system activity measured with the of the Body Perception Questionnaire (BPQ, subdiaphragmatic subscore; $r = 0.36$, $p = 0.04$).
These findings suggest that PU are reflected in a distributed functional brain network integrating sensory, basal ganglia, and higher-order associative regions, supporting the concept that PU arise from an interaction between interoceptive processing, sensory integration, and motor preparation. This perspective provides a novel framework for understanding the neural mechanism underlying sensory phenomena in tic disorders and may enable future targeted interventions.

P10. Neuromodulation as a new treatment option for tic disorders: a case report

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Background:
Tourette syndrome is a debilitating neuropsychiatric condition often resistant to conventional therapies, necessitating innovative approaches. Recent studies have shown modern non-invasive brain stimulation, such as transcranial magnetic stimulation (TMS), to be a promising neuromodulatory tool for tic disorders. Furthermore, advances in ultra-high-field neuroimaging and network-based analyses have enabled the exploration of TMS-induced neuroplastic changes, offering new insights into potential therapeutic mechanisms.

Methods:
We present a 22-year-old patient with a 5-year history of multiple motor and vocal tics. MRI was performed at 7T on admission, followed by a course of 20 single TMS sessions and a second MRI scan after the therapy. For the TMS sessions we used a 1 Hz inhibitory protocol over the supplementary motor area, directly followed by an excitatory 5 Hz TMS protocol over the cerebellum. The MRI scanning protocol comprised a T1 weighted MP2RAGE for structural (sMRI) and a T2* weighted multiband EPI sequence for functional imaging (fMRI). During fMRI the patient was instructed to close his eyes and not think of anything specific for 10 minutes (resting state). The sMRI and fMRI data were preprocessed using CONN 25.b, followed by the application of graph theory and a precision statistical framework [.

Results and conclusions:
There was a significant reduction in tic severity, intensity, and frequency and, a marked decrease in comorbid depressive symptoms. fMRI showed corresponding changes in functional network topology. The post-TMS scan showed a significant increase in the average path length in the cerebellar vermis, indicating reduced speed of communication through this node. Additionally, we observed a lower clustering coefficient in the right anterior fusiform cortex, indicating reduced functional segregation suggesting improved ability to regulate social information by switching out of its local subnetwork when necessary. Global efficiency also decreased in the left posterior inferior temporal gyrus, suggesting better integration of large-scale motor control networks with the cerebellar regions by reducing communication speed. Overall, these network-level changes support a partial normalization of cerebello-thalamo-cortical connectivity and social-decision making networks following the multiple target TMS intervention. These findings align with the clinical improvements observed in tic symptoms and prior findings in literature.
This case study sheds light on the potential of TMS as a successful neuromodulatory treatment option for Tourette syndrome and emphasizes the emerging role of the cerebellum as a potential target for devising new treatment strategies.

P11. ASH1L-Related Neurodevelopmental Disorder Presenting With Tourette Syndrome, ADHD, and Epilepsy: A Case Report and Pathophysiological Integration

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Background:
ASH1L encodes a histone H3K4 methyltransferase essential for chromatin remodeling and transcriptional activation during critical periods of neurodevelopment. Loss-of-function variants in ASH1L cause a pleiotropic neurodevelopmental disorder characterized by intellectual disability, autism spectrum disorder, epilepsy, ADHD, and tic disorders. Experimental models demonstrate that ASH1L deficiency disrupts synaptic pruning, alters cortical lamination, induces excitatory–inhibitory imbalance, and promotes striatal dopaminergic hyperactivation. While Tourette syndrome (TS) and epilepsy have been mechanistically linked to ASH1L, the integration of tic disorder, ADHD, and epilepsy within a single molecular framework remains incompletely characterized in clinical practice, challenging standard management protocols.

Methods:
We report the clinical, electrophysiological, and genetic characterization of a 14-year-old male presenting with TS, ADHD, focal epilepsy with secondary generalization, and severe emotional dysregulation. Longitudinal neuropsychiatric assessment, serial overnight video-EEG recordings, brain MRI, and pharmacological response were documented. Trio-based whole-genome sequencing (WGS) was performed to identify rare pathogenic variants and establish genotype-phenotype correlations.

Results and Conclusions:
Early childhood was marked by hyperactivity, impulsivity, emotional dysregulation, and borderline intellectual functioning. Motor and vocal tics emerged at age six, progressing to complex tic phenomenology consistent with TS. At age seven, a focal-to-bilateral tonic seizure occurred; EEG revealed right frontal epileptiform discharges with sleep activation. MRI was normal. Valproate achieved sustained seizure control. Subsequent behavioral arrest episodes included at least one non-epileptic event documented by video-EEG.
Whole-genome sequencing identified a de novo nonsense variant in ASH1L: c.3808C>T (p.Arg1270)* in exon 3. This variant, absent in parents (de novo),

leads to a premature stop codon and protein truncation, consistent with haploinsufficiency. The clinical phenotype reflects the pleiotropic spectrum described in the literature, encompassing TS, ADHD, epilepsy, and behavioral dysregulation.
Pathophysiologically, tic expression may relate to striatal dopaminergic hyperactivation observed in Ash1l-deficient models, while epilepsy is consistent with experimentally demonstrated cortical excitatory–inhibitory imbalance and ADHD symptoms likely reflect disrupted fronto-striatal circuit maturation secondary to epigenetic dysregulation.
This case illustrates the integrated neurobiological expression of ASH1L haploinsufficiency across motor, attentional, and epileptic domains. Tourette syndrome, ADHD, and epilepsy appear as convergent manifestations of altered chromatin regulation, impaired synaptic refinement, and circuit-level disinhibition. Recognition of ASH1L-related neurodevelopmental disorder in patients with overlapping phenotypes may enhance diagnostic precision and support mechanistically informed management strategies. This case reinforces ASH1L as a strong candidate risk gene for "Tourette-Plus" phenotypes, suggesting that epigenetic dysregulation should be considered in patients with refractory behavioral symptoms and comorbid epilepsy.

P12. Examining mechanistic principles of behavioral interventions in GTS from a TEC-perspective

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Background:

Behavioral interventions such as Exposure and Response Prevention (ERP) and Comprehensive Behavioral Intervention for Tics (CBIT) are effective first-line treatments for tic disorders, yet their underlying mechanisms remain poorly understood. Within the framework of Binding and Retrieval in Action Control, tics can be conceptualized as excessive stimulus–response binding, leading to automatic retrieval of actions and impaired inhibitory control. To assess these processes, we employed a feature integration Go/NoGo task, in which feature overlap between consecutive trials serves as an index of binding and retrieval. Increased false alarm rates in NoGo trials under feature overlap conditions reflect stronger automatic response activation. The present study investigates how ERP and CBIT differentially modulate these behavioral and neurophysiological mechanisms.

Methods:

A total of 49 individuals with Gilles de la Tourette syndrome (GTS; 20 females, 29 males; age range: 9–40 years, *M* = 18.1) were included in the analysis. Of these, 29 participants received a 12-week CBIT intervention, while 20 underwent ERP therapy administered by trained therapists at either the University Hospital Schleswig-Holstein (Lübeck, Germany) or the Carl Gustav Carus University Hospital (Dresden, Germany). Additionally, 67 healthy controls (47 females; age range: 10–37 years, *M* = 20.3) were assessed. Participants completed a visual feature integration Go/NoGo task during EEG recording. Tic severity was evaluated using the Yale Global Tic Severity Scale (YGTSS) and standardized Rush video recordings. All participants were reassessed following the intervention period. Behavioral performance focused primarily on false alarm rates in NoGo trials.

Results and conclusions:
Both CBIT and ERP groups showed significant reductions in YGTSS total scores following the 12-week intervention, indicating the effectiveness of both treatments. A mixed ANOVA revealed a significant three-way interaction between time (pre vs. post), condition (feature overlap vs. non-overlap), and group (CBIT, ERP, HC). Post hoc analyses showed a significant reduction in false alarm rates from pre- to post-treatment only in the CBIT group under the feature-overlap condition. At baseline, both patient groups exhibited significantly higher false alarm rates compared to healthy controls. At follow-up, this difference persisted only in the ERP group. These behavioral findings suggest distinct mechanisms underlying the effects of CBIT and ERP. Neurophysiological analyses are ongoing and will further elucidate these mechanisms.

P13. Motor Selection and Inhibition in Tourette Syndrome; Insights from Beta Oscillations

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Background:
It is often assumed that the symptoms of Tourette's syndrome (TS) reflect a deficit in motor inhibition. However, neuropsychological tests and inhibition tasks yield mixed results, with some studies reporting a deficit and others not. Heterogeneity in group composition, especially regarding comorbidity, is often cited as a confounding factor. To address this issue, it may be useful to examine brain activity in homogeneous groups. Beta oscillations, closely associated with motor selection and inhibition, could be a key factor

involved. Studying beta activity may clarify whether motor inhibition is truly impaired in TS or whether other factors contribute to these problems. Therefore, our objective is to compare beta EEG activations during inhibition phases between a control group and a TS adult group without comorbidity.

Methods:
A group of 31 adults with TS was matched to 31 control participants based on age (TS: M = 36.4; controls: M = 33.9), IQ, sex, and handedness. EEG was continuously recorded from 60 electrodes during a stimulus–response compatibility task that included an inhibition condition. Time–frequency decomposition was performed using complex Morlet wavelets (3 cycles; 13–30 Hz, 20 frequency steps). Beta power was extracted and analyzed using 400 ms time windows, pre- and post-motor response. Inhibition condition beta power was extracted and analyzed using 400 ms time windows after the stop stimulus onset. Data were analyzed using a mixed-design ANOVA.

Results:
Significantly higher beta activation was observed in the TS group both before ($F(1,60)=15.48$, $p<.001$) and after motor responses ($F(1,60)=7.62$, $p<.05$), with the group effect more pronounced during the pre-response phase. This robust overactivation of beta was equivalent across compatible, incompatible, and No-Go conditions. Although the Group X Condition X Region interaction was not significant, paired comparisons revealed significant effects in the frontal, fronto-central, and central regions, both pre-movement ($p < .001$) and post-movement ($p < .01$). The TS group also showed frontal overactivation ($p < .01$) compared to controls, during post-stimulus inhibition.

Conclusions:
This beta overactivation may suggest heightened motor selection and inhibition in TS, potentially contributing to the altered modulation of motor responses often documented in TS. This could have therapeutic implications for that group.

P14. Explaining the genetics of tic disorders to children: development of a child-focused psychoeducational video addressing the limits of genetic testing

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Background:

The genetic basis of neurodevelopmental conditions, including tic disorders, is complex and evolving. Children and families often ask why tics occur and if genetic testing can provide answers to why a child has tics. However, few resources explain the genetics of tic disorders in a way that is accessible to young people and families, and instead rely on general references to "complex genetic factors" or familial patterns.
Although the precise cause of Tourette syndrome (TS) remains unknown, research suggests a strong genetic contribution. Family, twin, and genetic studies indicate substantial heritability, with around 30% of children with tics having a first-degree relative who also has tics (Heinman et al., 2025). TS is considered polygenic, with multiple genetic variants contributing to risk rather than a single casual gene. Environmental influences, including pregnancy-related factors, may also interact with genetic susceptibility to affect the likelihood of developing tics (Abdulakir et al., 2022). As a result, TS cannot currently be diagnosed using genetic or blood tests. Instead, diagnosis relies on clinical assessment and longitudinal evaluation of symptoms (Müller-Vahl et al., 2021) with psychoeducation as a first-line intervention for all individuals with tics (Andrén et al., 2021).
These gaps highlight the need for a clear, child-friendly educational resource that explain the genetics of tic disorders and set realistic expectations about genetic testing.

Methods:
A child-focused psychoeducational video was developed using "CreateStudio" to explain tic disorders, with a focus on TS, the role of genetics, and limits of genetic testing. Content was informed by current scientific literature on tic disorders, including studies on genetic contributions, gene-environment interactions, and clinical diagnostic practices.
A storyboard structured the video into concise segments. The script used age-appropriate language, simplified technical terminology, and analogies to explain complex genetic concepts. Clinical and genetics experts provided iterative feedback to ensure accuracy and suitability for a child audience while maintaining a public-health perspective.

Results and Conclusions:
Evidence from the literature guided the video's content, emphasising that tic disorders are influenced by multiple genetic variants and environmental factors (Lin et al., 2022; Sun et al., 2026), that heritability is substantial but not deterministic (Mataix-Cols et al., 2015; Eldridge et al., 1977; Párraga et al., 1998), and that comorbidities, such as OCD, show partial genetic overlap (Wang et al., 2025).
This resource addresses a critical gap in accessible genetic education for children with tic disorders and their families, who often face complex scientific literature that is difficult to interpret. The resource will be made available on the website of a National Tic service in the UK. Clinicians may

signpost patients to this free resource to build understanding and support discussions around genetic testing in TS.
Feedback was sought from young people with tic disorders and families within the Tic Service. Co-production will help ensure the resource is accessible, relevant, and tailored to the community's needs. Ultimately, the video has the potential to improve patient education, support clinical communication, and inform evidence-based decision-making regarding genetic testing. We recognise that its utility may be time-limited as translational genetic research progresses.

P15. Tic Disorders & Psychomotor domain in schizophrenia spectrum disorders- a case report and literature review

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Background:
We report a 16-year-old female with global developmental delay and mild intellectual disability, initially treated by paediatric neurology for a provisional tic disorder. Investigations, including neuroimaging and metabolic and autoimmune tests, were unremarkable. She did not respond to Clonidine and, due to reduced oral intake and weight loss, was switched to Aripiprazole. She was referred to neuropsychiatry for possible co-existing conditions, including catatonia.
Psychiatric assessment (clinical history, observation, and mental/physical examination) suggested a 'first episode of psychosis' with auditory hallucinations and behavioural change. Assessment using the Comprehensive Assessment of At-Risk Mental States (CAARMS) was conducted attempted. Catatonic features—psychomotor slowing, withdrawal, perseveration, negativism, verbigeration, and ambitendency—were identified using the Bush–Francis Catatonia Rating Scale (BFCRS). Facial motor tics were also observed, emerging alongside psychotic and catatonic symptoms. Optimisation of Aripiprazole improved oral intake, weight, and school attendance, though residual psychotic, tic, and catatonic symptoms persisted. Lorazepam was introduced for catatonia, with ongoing follow-up planned.

Methods:
A literature review (to 10/03/2026) across PubMed, Embase, Medline, PsycInfo, and EMCare identified 9 relevant studies after screening.

Results:

Evidence supports a neurodevelopmental origin for schizophrenia spectrum disorders (SSD), with motor abnormalities as early indicators of vulnerability. Increasing focus has been placed on sensory and psychomotor domains for early identification, prognosis, and personalised treatment. Adolescents with prodromal psychosis show subtle hyperkinetic facial movements.
Motor dysfunction is common across neuropsychiatric disorders and serves as a transdiagnostic marker of severity. Catatonic features are also prevalent in non-psychotic groups such as Tourette syndrome.
Mechanistically, impairments in Corollary discharge may link motor abnormalities and psychosis risk. Neuroimaging studies highlight shared dysfunction in basal ganglia–cortical circuits.
Neurological soft signs (NSS), including deficits in coordination, integration, and inhibition, are frequently observed in SSD and linked to frontoparietal and cerebellar dysfunction. These networks are central to movement regulation, suggesting a shared neural substrate for tics and psychosis.

Conclusions:
Motor abnormalities may represent more than general neurodevelopmental disruption and could be directly linked to psychosis risk. Advances in digital tools, neuroimaging, and AI offer improved measurement of motor dysfunction. Integrating sensory and psychomotor assessments into clinical and research practice, —supported by longitudinal, multimodal, and collaborative approaches, —may enhance diagnosis, treatment, and understanding of severe mental illness.

P16. Tourettic Obsessive-Compulsive Disorder: Preliminary Clinical Outcomes of an Integrated Exposure and Response Prevention and Habit Reversal Intervention

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Background:
Tic Disorders (TD) such as Chronic Tic Disorder (CTD) and Gilles de la Tourette Syndrome (GTS) and Obsessive-Compulsive Disorder (OCD) frequently co-occur, giving rise to a clinically complex presentation often referred to as Tourettic Obsessive-Compulsive Disorder (TOCD). Individuals with TOCD exhibit overlapping phenomena, including premonitory urges, compulsions with sensory features, and repetitive behaviours that are difficult to categorize as either tics or compulsions. Despite growing recognition of TOCD as a distinct clinical phenotype, there remains limited guidance regarding optimal psychotherapeutic intervention(s). Standard evidence-based treatments -

Exposure and Response Prevention (ERP) for OCD and Habit Reversal Training (HRT) for TD - are typically applied in isolation, potentially overlooking shared and interacting mechanisms.
Objective: To evaluate the feasibility and preliminary effectiveness of a hybrid psychotherapeutic intervention integrating ERP and HRT for patients presenting with a TOCD symptomatology.

Methods:
A prospective clinical intervention was conducted with participants (n= 6) meeting diagnostic criteria for CTD/GTS and OCD and characterized by overlapping tic–compulsion behaviours. The intervention combined core components of ERP (i.e., systematic exposure to obsession-related stimuli with response prevention) and HRT (i.e., awareness training and competing response practice), delivered within a unified treatment framework. Symptom severity was assessed at baseline and post-treatment using standardized independent clinician-rated measures, including the Yale–Brown Obsessive Compulsive Scale (Y-BOCS) and the Yale Global Tic Severity Scale (YGTSS). Treatment adherence and tolerability were monitored throughout.

Results:
Preliminary findings indicate that the hybrid ERP and HRT intervention was associated with clinically meaningful reductions in both tic severity and tic-related impairment and obsessive–compulsive symptoms. Changes in tic severity were strongly correlated with changes in tic-related impairment (Spearman's $\rho = .81$, $p = .028$), indicating concordant symptom and functional improvement. In contrast, changes in obsessive–compulsive symptoms were not strongly associated with tic-related changes, suggesting partial independence of treatment response across domains. Higher impulsivity, as measured by the Barratt Impulsiveness Scale, was significantly associated with poorer overall intervention response ($\rho = -.83$, $p = .021$). Autistic traits showed a positive but non-significant association with overall improvement ($\rho = .72$, $p = .068$), while attention-deficit/hyperactivity disorder traits demonstrated a weak and non-significant negative association with treatment response ($\rho = -.42$, $p = .35$). Participants demonstrated good engagement with the integrated protocol, and no significant adverse effects were observed.

Conclusions:
This study provides preliminary support for a hybrid ERP and HRT approach being a feasible clinical intervention in TOCD based on pilot data, with preliminary indication of effectiveness regarding clinically meaningful change. By targeting shared sensory, cognitive, and behavioural mechanisms, an integrated intervention may better reflect the clinical reality of this population. Individual differences (i.e., impulsivity and autistic traits) may shape response. Larger controlled studies are warranted to establish efficacy, clarify mechanisms of change, and inform treatment guidelines.

P17. From Training to Practice: Evaluating a CBIT Programme's Impact on Clinician Confidence and Service Pathways

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Background:
Within the UK, limited access to Comprehensive Behavioural Intervention for Tics (CBIT) remains a barrier to timely and effective treatment for tic disorders, partly due to low clinician confidence and limited training opportunities. Tourette's Action (TA) developed a structured CBIT training programme to improve clinician knowledge, confidence and readiness to implement evidence-based tic assessment and interventions within primary and secondary mental health services.

Methods:
A mixed-methods evaluation was conducted following a two-day CBIT training programme delivered to Senior Wellbeing Practitioners for Children and Young People PGDip and clinical supervisors in collaboration with Edge Hill University. The programme was designed and delivered by a CBIT-certified occupational therapist with lived experience. Day 1 (5 hours, online) was delivered to both students and supervisors and focused on tic assessment, co-occurring features and differential diagnosis. Day 2 (5 hours, face-to-face) was delivered to students only and focused on therapeutic interventions including CBIT, Habit Reversal Training (HRT), psychoeducation and Exposure and Response Prevention (ERP), alongside practical clinical activities. Pre-, post- and follow-up self-rated confidence scores were collected. Qualitative data from open-ended responses were analysed thematically.

Results:
Following Day 1 (n=45), confidence increased by 63–100% across assessment domains. Following Day 2 (n=20), confidence increased by 75% in explaining treatment rationale, 127% in describing CBIT components and 230% in applying HRT techniques. Post-training, 100% reported readiness to implement at least one strategy.
Long-term follow-up (n=11) indicated sustained confidence, with 55% applying strategies and 64% supporting at least one individual with tics. 73% reported sharing learning and contributing to service discussions. Some had not yet applied learning due to limited caseload exposure; this was often attributed to the absence of established referral pathways prior to training, with participants reporting that training prompted services to review

inclusion criteria and begin developing more inclusive pathways for tic-related care.
Qualitative findings highlighted strong clinical relevance and value of lived-experience input. Participants described early-stage application, including assessment and delivery of psychoeducation to children and families where full CBIT was not developmentally appropriate. In services with existing pathways, trainees reported more immediate implementation, indicating variability linked to service readiness. Barriers included time constraints, service limitations and limited ERP supervision opportunities.

Conclusions:
This evaluation demonstrates that a blended CBIT training programme improves clinician confidence and implementation readiness, with early evidence of sustained application. Training may also act as a catalyst for service-level change, supporting development of referral pathways and more inclusive access to care. Programme expansion to a three-day model is planned to support advanced skill consolidation.

P18. When the Body Speaks: An Occupational Therapy–Led Sensory Approach to Tic Management in Tourette Syndrome and Functional Neurological Disorder – Case Study

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1 Tourettes Action; 2 Sheffield Hallam University; 3 Sensory Integration Education Network

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Background:
Premonitory urges in Tourette Syndrome (TS) can be understood as uncomfortable interoceptive experiences. Differences in interoceptive sensitivity, including hypo- or hyperresponsivity to internal bodily signals, may affect an individual's ability to recognise and describe these experiences, as well as influence their perceived intensity and associated distress. This may, in turn, limit engagement in classic tic management interventions such as Habit Reversal Training (HRT). Neurodevelopmental conditions, including TS and commonly co-occurring Autism Spectrum Conditions (ASC), are associated with differences across sensory domains, including processing, integration, modulation, and reactivity. Despite this, clinical approaches to TS often prioritise behavioural strategies, with limited integration of sensory frameworks.

Methods:
This case study describes an eight-session community paediatrics Occupational Therapy–led intervention for a 15-year-old female who had previously unsuccessful engagement with HRT. She had diagnoses of TS, Functional Neurological Disorder (FND) and tic-like behaviours and was

awaiting an ASC assessment. She presented with severe motor and vocal tics (YGTSS = 86), coprolalia, non-epileptic seizures, alexithymia, and significant sensory sensitivities, contributing to reduced school attendance (61%).
The brief intervention integrated sensory processing, tic management, and FND-informed approaches. Assessment included occupational profiling, functional analysis, and multi-source sensory evaluation using the Adult/Adolescent Sensory History (ASH). Intervention components included: (1) psychoeducation on TS, tic-like behaviours and FND, including attention, arousal, and sensory influences; (2) school consultation, including staff training to reduce attention to episodes and support safe, consistent, non-reinforcing responses; and (3) targeted sensory intervention. This included interoceptive awareness training to support recognition of premonitory urges, tactile and auditory modulation and compensatory strategies to reduce sensory threat responses, proprioceptive input for regulation and grounding, and attention reorientation strategies to shift focus from internal sensations to the external environment. Individualised sensory regulation plans were developed and implemented across home and school contexts.

Results and Conclusions:
Goal-Based Outcomes improved from 2/10 to 8/10 (understanding tics) and 3/10 to 6/10 (managing tics). At four-week follow-up, school attendance increased to 87%, with consistent engagement in sensory strategies. Parents and school staff reported reduced frequency and duration of non-epileptic seizures, alongside improved confidence and consistency in responding to tic and FND symptoms.
Tic severity reduced (YGTSS: 86–62), with greatest improvements in impairment, frequency, and complexity, alongside functional gains. The young person demonstrated improved awareness of premonitory urges, reduced tic-related distress, improved arousal regulation, and increased participation. Engagement and motivation to practise strategies increased with sensory-based supports, experienced as more enjoyable, accessible, and less distressing than HRT.
This case highlights the potential value of an Occupational Therapy–led, sensory-informed approach integrating interoceptive awareness with broader sensory modulation and attention-based strategies to reduce tic symptoms and co-occurring functional features.

P19. Navigating Digital Media Habits of children in a Paediatric Movement Disorder Clinic – A pilot study

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Background:
Digital media use is increasingly recognised as an important factor influencing child development, and behaviour. The last two decades have seen a rapid expansion in the use of digital media. It is not only used as a tool to keep in contact with others, but also as a tool for information sharing, entertainment, amongst other topics. Research suggests that increased screen time and/or social media use may be linked with greater tic severity or risk of functional tic like behaviours; however, to our knowledge there is currently no recommended standardised tool for clinicians to assess digital media habits as a holistic evaluation of their impact on tics and treatment outcomes. The absence of a formal assessment tool can mean important information is lacking, impeding delivery of care for children with tics.

Methods:
This quality improvement project adopts a qualitative design using the multi-cycle Plan-Do-Study-Act (PDSA) framework. The project was initiated in response to a need to better understand digital media use within families and to support clinicians in acquiring wide social knowledge. A screen time proforma was developed for integration into routine assessments. Cycle 1 will focus on analysing the ease of use and implementation of a standardised screening tool, before evaluating its effectiveness in assessing digital media habits and then the impact of this on children with Tourette Syndrome. In addition, a YALE scale will be administered as part of standard clinical practice. The project includes an interview with clinicians exploring their experiences of assessing patients with the screen time/social media proforma, and the association of this with tic severity. Patient and Public involvement is involved. The questionnaires and intervention will be presented, and the pilot can be developed with colleagues in ESSTS. Post-intervention data will be presented which evaluates change in assessing effects of digital media and tic severity, and usability and implementation in the service setting.

Results and discussion:
Due to ongoing research, the results will be presented at the conference and we would hope for collaboration to develop this pilot study.

Conclusions:
We have developed a pilot tool to collate information on screen time and digital media use in a tic clinic population. We aim to present associations with tic severity for children aged 6-18 years old.

P20. A Retrospective Analysis of Gastrointestinal Issues in Children with Tics and/or OCD

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Background:
Tic disorders and obsessive-compulsive disorder (OCD) are childhood-onset neurodevelopmental conditions that frequently co-occur. Genetically, they have a remarkably high cross-heritability. It is estimated that up to 50% of youth with tic disorders meet diagnostic criteria for OCD, and 20–30% of those with OCD have a co-occurring tic disorder. While gastrointestinal (GI) disorders such as irritable bowel syndrome and functional constipation have been well documented in individuals with OCD, little data exists for GI and toileting issues in youth with tic disorders. This study aimed to retrospectively evaluate and compare the prevalence of GI symptoms and toileting issues in three groups of individuals: those with tic disorders, those with OCD, and those with co-occurring tics and OCD.

Methods:
This chart review included patients aged 6 to 22 who were identified based on the ICD-9 and ICD-10 diagnosis codes and categorized into three groups: 1) Tics, 2) OCD, and 3) Tics+ OCD. Patients were excluded if there was insufficient information in the chart or if diagnosed with Pediatric Acute-onset Neuropsychiatric Syndrome, non-verbal autism, or G tube/J tube presence. Additionally, patients with functional tic-like behaviors were excluded.

Results and Conclusions:
We analyzed GI conditions such as abdominal pain and toileting issues, specifically constipation, diarrhea, enuresis, and encopresis. After adjusting for age and sex, the only significant difference was in the rates of constipation. Compared to the Tic group, patients in the OCD group had significantly higher odds of having constipation (OR=1.95, 95% CI =1.11-3.46, p=.021), whereas the Tics & OCD group did not (OR= 1.50, 95% CI = 0.82-2.73, p=.18).
Interestingly, the OCD group had higher rates of constipation than the Tics group, and the Tics & OCD group did not. Prior research has indicated that OCD with tics represents a phenotypically distinct subtype, characterized by symmetry, ordering, and touching compulsions, while individuals with OCD alone have more contamination and cleaning rituals. Higher rates of constipation in children with OCD should be taken into consideration for therapeutic approaches to this population and further support a clinical distinction between OCD alone and OCD that co-occurs with tics. Our results also highlight the importance of screening for GI and toileting issues in these populations.

P21. New-onset complex movement disorder in a patient with Tourette Syndrome: an unsolved case

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Background:

Tourette syndrome (TS) is frequently accompanied by comorbidities such as Attention-Deficit/Hyperactivity Disorder (ADHD) and Obsessive-Compulsive Disorder (OCD). Additional psychiatric, behavioral, and sleep disturbances can further complicate the clinical picture. TS patients may also develop other movement disorders (MDs), which must be differentiated from tics to guide appropriate treatment (Baizabal-Carvallo and Jankovic, 2021). We present the case of a 19-year-old male, diagnosed in childhood with TS and comorbid ADHD and OCD, who developed a complex movement disorder during adolescence.

Methods:

A detailed clinical history and neurological examination were performed, along with laboratory tests, neurophysiological assessments, and neuroimaging studies, to characterize the disorder and investigate potential etiologies. Genetic testing using a dystonia-focused next-generation sequencing (NGS) panel was also carried out.

Results:

Family and personal history were unremarkable, and early psychomotor development was normal. At age 7, the patient developed motor and vocal tics, leading to a diagnosis of TS. Shortly thereafter, ADHD and OCD were diagnosed. Initial treatment with aripiprazole provided clinical stability for several years. At age 17, without clear precipitating factors, tics increased in frequency and severity, accompanied by motor slowing and progressive decline in motor performance. The clinical picture evolved to include rigidity, tonic stuttering, urinary incontinence, and loss of independence in daily activities. Notably, when required to perform a task or respond verbally, the patient exhibited extreme latency (up to several minutes) due to dystonic postures (forward bending of head and trunk, wide mouth opening) and stereotyped movements (oscillations of trunk, shoulders, and head; forced hand-to-mouth movements), resulting in monosyllabic speech. Neurological examination revealed a subtle, high-frequency postural tremor. Multiple pharmacological treatments (sertraline, tetrabenazine, aripiprazole, biperiden, clomipramine, risperidone) and psychotherapy produced minimal improvement; the patient is currently not on medication.

Brain MRI showed minimal widening of fronto-parietal and cerebellar subarachnoid spaces. Video-EMG recordings demonstrated rhythmic high-frequency (12–13 Hz) activation of deltoid muscles, while EEG-EMG coherence analysis did not support a cortical origin. Genetic analysis revealed a heterozygous variant in XPR1, not previously reported but predicted to be pathogenic. Brain CT excluded calcifications, leaving the clinical significance of the variant uncertain.

Conclusions:
Our patient presents a disorder that began in childhood with Tourette Syndrome, subsequently complicated by a complex movement disorder of difficult definition. The investigations did not highlight organic alterations that could explain the current picture, supporting the alternative diagnosis of an invalidating Functional Neurologic Disorder. The case highlights the complexity of Tourette syndrome and its potential overlap with other movement disorders, underlining the challenges in achieving a clear etiological understanding and guiding therapeutic decisions.

P22. When Should We Medicate Tics? Evidence Gaps and a Proposed Pathway

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Background:
Utilizing medication for tic disorders is routine in clinical practice, yet the field still lacks clear, operational thresholds for when to initiate medication. Existing research and clinical discussions about tic disorders often emphasize which intervention to use (e.g. medication type), but the decision for when to start medication frequently relies on subjective experience rather than standardized, objective indicators. Consequently, clinical decisions around starting tic medication vary widely, and empirical evidence describing the decision-making process remains limited. To address this gap, we (1) reviewed existing literature and guidelines relevant to tic medication initiation, (2) developed a conceptual framework synthesizing factors that may affect initiation decisions, (3) examined why a single standardized initiation threshold is difficult to operationalize for tic disorders, and (4) proposed a decision pathway outlining key factors to consider when deciding whether to start tic medication.

Methods:
We reviewed empirical studies and guidelines addressing factors influencing tic medication initiation and organized findings into patient-, provider-, and system-level categories. Since September 2025, an interdisciplinary, cross-national workgroup has met to synthesize findings and develop the proposed decision pathway.

Results and Conclusions:
The literature review identified no standardized threshold for tic medication initiation. Current guidelines emphasize collaborative care, impairment, and the availability of behavioral treatment in tic medication initiation decisions. Available studies suggest that initiation decisions are influenced by patient-level factors (e.g. tic phenomenology/severity, impairment, anticipated medication side effects, comorbidity, patient/family preferences); provider-level factors (e.g. clinician specialty, assessment tools); and system-level factors (e.g. regional variability). Beyond the published literature, we synthesized additional candidate variables that may influence initiation decisions, including prior behavioral therapy for tics (patient level), child vs. adult- trained clinical (provider level), or local access to tic-specific psychotherapy (system level), and integrated these into a conceptual framework. Our findings suggest that a single initiation threshold is difficult to define for tic disorders and unlikely to be feasible or clinically useful. Challenges to a unified threshold include the frequent divergence of tic severity and subjective impairment, the natural course of tics independent of medication, comorbidity-driven treatment targets, and variable access to tic-specific behavioral therapy.
In conclusion, while many neurologic or psychiatric disorders use defined thresholds for medication initiation (i.e., scale-based cutoff scores), this is not the case in tic disorders. Based on the factors involved in medication initiation, we suggest that no single standardized threshold cutoff is suitable for determining medication initiation, rather, initiation is best conceptualized as a multidimensional clinical decision. Accordingly, we outline a structured decision pathway that supports individualized clinical reasoning rather than a universal cutoff.
Lastly, future research should examine real-world clinical decisions about tic medication initiation, which may inform more evidence-based practices.

P23. Enuresis and encopresis in patients with tic disorders: case report and review of the literature

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Background:
The coexistence of tic disorders, including Tourette syndrome (TS), with elimination disorders such as enuresis and encopresis has been described in clinical practice but remains relatively under-recognized. Both conditions are common in neurodevelopmental populations and may reflect shared neurobiological mechanisms involving impaired inhibitory control and dysregulation of cortico–striato–thalamo–cortical circuits (Dang & Tang, 2021, Wang et al., 2011). In addition, elimination symptoms may occur due to severe and/or repetitive abdominal tics or as adverse effects of pharmacological treatments used for tic disorders.

Methods:
We present a case of a child with TS who suddenly developed enuresis and encopresis. We complement it with the review on current knowledge regarding the co-occurrence of enuresis and encopresis in patients with tic disorders, focusing on epidemiology, proposed neurobiological mechanisms, psychiatric comorbidities, and the potential role of pharmacotherapy.

Results:
We report the case of a 7-year-old boy with TS with a complex history of motor and phonic tics with the onset at age 3. Over the years, tics had a waxing and waning course and mainly included facial grimacing, but also grunting and coughing. Pharmacological treatment of tics was initiated due to excessive eye blinking which caused pain. Approximately 3 months after the initiation of pharmacotherapy with aripiprazole at a dose of 2.5 mg daily, the patient's mother reported new-onset urinary and fecal incontinence In parallel, the boy's tics increased, however mainly facial tics were present. Possible mechanisms for enuresis and encopresis considered included abdominal or pelvic floor tics interfering with bladder control which could have been missed by the caregiver and were not reported by the child. Alternatively, rarely aripiprazole may cause incontinence. Accordingly, treatment with aripiprazole was discontinued resulting in a symptom improvement.
Our review of the literature showed that nocturnal enuresis occurs in approximately 15–30% of children with TS, which is significantly higher than the 5–10% prevalence observed in the general pediatric population. Encopresis appears less frequent but has been reported in 3–10% of children with tic disorders. Elimination disorders in TS are often associated with additional clinical features including ADHD, OCD, anxiety, sleep disturbances, and emotional dysregulation. Proposed mechanisms include immaturity or dysregulation of fronto–striatal–thalamic circuits involved in inhibitory control, altered dopaminergic signaling, and impaired cortical regulation of bladder and bowel function (Mariangela Gulisano et al., 2017) (Tsai Hl, et al.,2020). In addition, pharmacological treatment of tics—particularly with

antipsychotic medications—may contribute to urinary or fecal incontinence through mechanisms such as sedation, changes in arousal regulation, or modulation of autonomic and dopaminergic pathways. In TS, case reports and clinical observations suggest that antipsychotics including aripiprazole may rarely cause urinary incontinence or bowel dysfunction (Arasteh et al., 2021)

Conclusions:
Clinicians treating children with TS should be aware of elimination disorders. Careful assessment of symptom onset in relation to tic severity and pharmacotherapy is essential in order to guide appropriate management and avoid unnecessary diagnostic procedures.

P24. Drug-induced tics: a systematic review and meta-analysis

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Background:
Tics are most commonly associated with primary neurodevelopmental disorders; however, new-onset or exacerbated tics have also been reported as adverse effects of various medications. Despite increasing clinical recognition, the scope, implicated drug classes, temporal characteristics, and comparative risk of drug-induced tics have not been systematically quantified.
Objectives: To systematically review and meta-analyze the evidence on drug-induced tics, identifying implicated medications, latency to symptom onset, clinical characteristics, and pooled risk estimates from randomized controlled trials (RCTs).

Methods:
A systematic search of PubMed/MEDLINE, Embase, PsycINFO, and the Cochrane Library was conducted from inception to December 2025 in accordance with PRISMA guidelines. Eligible studies included RCTs, observational studies, case series, and case reports describing new-onset or worsened tics temporally associated with medication exposure. Random-effects meta-analyses were performed for drug classes with available RCT data comparing active treatment with placebo or control conditions.

Results:

The preliminary search identified 1,151 records. Following initial screening, 63 studies met inclusion criteria for qualitative synthesis, comprising 1,420 patients. These included 38 case reports, 12 case series, 10 observational studies, and 3 randomized controlled trials; 14 studies were eligible for quantitative synthesis.
Psychostimulants were the most frequently implicated drug class (24 studies; 37% of cases), followed by antidepressants (16 studies; 25%), antipsychotics (11 studies; 17%), antiepileptic drugs (7 studies; 13%), and non-psychiatric medications (5 studies; 8%). Non-psychiatric medications included cardiovascular agents (e.g., calcium channel blockers and beta-adrenergic antagonists), respiratory and allergy treatments (including β_2-adrenergic agonists, theophylline, and leukotriene receptor antagonists such as montelukast), anti-infective agents (most commonly antibiotics, including fluoroquinolones and macrolides), and hormonal or metabolic therapies (notably systemic corticosteroids and thyroid hormone preparations).
Notably, montelukast and related leukotriene receptor antagonists were reported in several cases, often in pediatric populations, with temporal associations between treatment initiation and tic emergence or exacerbation, consistent with growing concerns regarding neuropsychiatric adverse effects in this drug class.
Median latency to tic onset was shortest for psychostimulants (2 weeks), followed by antidepressants (4 weeks), antipsychotics (6 weeks), antiepileptic drugs (8 weeks), and non-psychiatric medications (10 weeks). Tics improved or resolved after dose reduction or discontinuation in approximately 78% of cases. Males were more frequently affected than females (65% vs 35%), consistent with known sex differences in tic susceptibility; however, latency to onset and likelihood of symptom resolution did not differ substantially by sex.
Meta-analysis of RCTs demonstrated a modest but statistically significant increase in tic risk for psychostimulants (RR 1.32, 95% CI 1.08–1.61) and antidepressants (RR 1.21, 95% CI 1.02–1.44) compared with controls. Evidence for antipsychotics was inconclusive, and no RCT data were available for antiepileptic or non-psychiatric medications, including leukotriene receptor antagonists.

Conclusions:
Drug-induced tics are rare and occur across a broad range of medications and should be considered in patients presenting with new-onset or worsening tics. Particular attention should be warranted for non-psychiatric agents such as leukotriene receptor antagonists, specifically montelukast, given emerging evidence of neuropsychiatric adverse effects. Improved awareness of sex differences, latency patterns, and reversibility may support more accurate diagnosis and individualized risk–benefit assessment.

Poster session II

P25. From ORBIT to Impact: The Translational Journey of a Research Project to Real-World Implementation

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Background:
Behavioural therapy, such as Exposure and Response Prevention (ERP), is widely recommended as a first line treatment for tic disorders and can be effectively delivered online. Despite this, translating effective digital interventions from research settings into routine healthcare remains challenging. ORBIT (Online Remote Behavioural Intervention for Tics) has progressed through multiple stages of evaluation, redevelopment, and implementation, offering an opportunity to examine the practical realities of moving from clinical efficacy to real-world implementation. This abstract reflects on the translational journey of ORBIT across three linked studies, offering implementation-focused insights and lessons that may inform the development and adoption of future digital interventions for tic disorders.

Methods:
ORBIT's translational pathway spans three linked studies. First, a large randomised controlled trial demonstrated ORBIT's clinical and cost-effectiveness, supported by process and health economic evaluations indicating acceptability to families and potential cost savings for the National Health Service (NHS). This raised the central implementation question of how to translate an effective research intervention into routine practice. We set out to address this challenge through a single-cohort usability study, partnering with industry to redevelop ORBIT on an NHS-compliant platform and evaluate usability within an NHS service. Here, our focus shifted from efficacy to implementation readiness through co-production with patients, clinicians, and industry partners. Following a conditional recommendation from the National Institute for Health and Care Excellence (NICE), ORBIT is now being evaluated through a real-world implementation and service evaluation across five NHS settings, integrating psychoeducation within a stepped-care pathway and generating evidence on service impact including reduction of waiting times.

Results and conclusions:
Translating ORBIT from a research intervention into routine NHS care highlighted a range of implementation challenges. Challenges included navigating communication across academic and industry contexts, managing mismatched timelines and delays associated with university contracting, and addressing intellectual property arrangements within systems not optimised for digital innovation. These challenges underscored the value of dedicated translational roles to bridge sectors, and realistic planning for time and cost. Key lessons include the importance of embedding implementation thinking from the outset of research, designing trials that anticipate decision-maker needs, and involving stakeholders, including multidisciplinary teams and patient and public representatives, from the earliest stages. Importantly, the translational process also created opportunities: engagement with commissioners informed future adoption pathways, and implementation-focused work enabled research to deliver tangible benefits for tic disorder services. Together, these insights highlight how embedding implementation thinking from project inception can accelerate the real-world impact of evidence-based interventions for tic disorders.

P26. Centring Tourettic Experiences in Technology: Tourette Syndrome, Median Nerve Stimulation, and the Role of Technoableism

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Background:
Tourette Syndrome (TS) is a neurodevelopmental condition characterized by motor and vocal tics. In recent years, interest has grown in neuromodulation approaches as potential non-pharmacological treatments for tic reduction. One such approach is median nerve stimulation (MNS), delivered via wearable devices that allow individuals to self-administer stimulation in everyday settings. Initial studies suggest that rhythmic MNS may transiently reduce tic frequency in some people with TS, generating enthusiasm for the development of consumer-facing wearable devices. However, as these technologies move from controlled experimentation settings toward wider clinical and commercial implementation, it is important to consider broader clinical, ethical and social implications. In particular, questions arise regarding expectations of tic suppression, user safety, and how technological interventions may shape understandings of treatment goals and patient wellbeing. This paper examines emerging wearable MNS technologies for TS within this wider context, using the concept of 'technoableism'.

Method:
This paper presents a conceptual and critical analysis of emerging wearable MNS interventions for TS. It draws on published experimental studies of MNS in tic disorders alongside interdisciplinary scholarship on disability, medical technology and the concept of technoableism. Offering a wide array of examples of technoableist engagement with TS such as the OMBRA mask, the non-consentual muting of people with TS in radio/video conferencing environments, the analysis focuses on how wearable MNS devices such as Neupulse are currently framed within TS research and translational pathways, particularly in relation to treatment goals, self-management and the shift toward patient-operated technologies. Attention is given to issues of safety, potential unintended consequences of unsupervised use, and the implications of framing tic reduction as a primary therapeutic objective.

Results and Conclusions:
Current enthusiasm for wearable MNS devices reflects an important effort to expand treatment options for people with TS, particularly non-p[pharmacological approaches that can be used outside clinical environments. However, the increasing focus on wearable MNS devices also raises several considerations for clinicians and researchers. First, the emphasis on tic suppression as a primary outcome may risk reinforcing social pressures to control visible tics, potentially overlooking broader dimensions of quality of life. Second, the move toward self-administered MNS introduces new questions regarding safety, monitoring and patient responsibility in non-clinical contexts. Finally, the framing of these technologies may influence how TS itself is conceptualized within research and care. We argue that future development and evaluation of wearable MNS technology should incorporate patient perspectives and participatory research approaches, alongside rigorous assessment of safety, usability and real-world impact. Such work will be essential to ensure that technological innovation aligns with the priorities and wellbeing of people living with TS.

P27. Looking to the future of Tourette Syndrome Research

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Background:
Tourette Syndrome (TS) research is at a crucial turning point. As more and more researchers, media outlets, artists and *key thinkers* take up TS as an item of interest, something is still missing. Recently, there has been a subtle shift in the ways that TS discourse is produced that has several concerning

consequences. Binary thinking surrounding TS has produced concerning epistemic and political polarisations across research, clinical practice, and public discourse that result in the policing of authenticity, behavioral framings of tics, and an over-reliance on narratives of cure. There is a need for increasing critical approaches to TS.

Methods:
This paper shares the findings of an online roundtable event 'Towards Tourettic Studies: The future of Tourette Syndrome research', hosted by Durham University's Institute for Medical Humanities in late-2025. Bringing together a tourettic majority from a range of disciplinary backgrounds including psychology, sociology, education, human geography, and the medical humanities, this paper summarises key contributions by speakers at the event and the subsequent roundtable discussions.

Results and Conclusions:
Emerging themes that capture this critical shift in TS research are threefold. Firstly, there is a particular need for paying closer attention to language. Semiotics has a key influence over various aspects of tourettic experiences such as on how TS is perceived and responded to by both researchers and publics alike. This includes references to tics as 'behavioural' and the tourettic community as 'sufferers', both commonly used in recent publications. Additionally, close attention needs to be paid to how language is used and molded to bypass algorithmically suppressed topics of discussion such as TS on social media sites such as TikTok. Secondly, we call for the questioning of power dynamics that currently exist between disciplines (i.e. clinical research currently has more dominance than arts, humanities and social science-based TS research). Interdisciplinary approaches found in movements such as *Critical Autism Studies* may offer a useful model of interdisciplinarity that benefits the most important stakeholders in TS research – tourettic people. Finally, we urge more consideration of the social, cultural and political contexts surrounding TS. We must acknowledge the ways that TS is being weaponized by far-right political actors, and consider the impact of increasingly politicised experiences of TS.

P28. The Hidden Burden: Caregiver experiences in childhood tic disorders and OCD. A qualitative systematic review and synthesis

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Background:

Tic disorders and obsessive-compulsive disorder (OCD) are neuropsychiatric conditions that significantly impact not only affected children but also their families. Quantitative research has demonstrated significant impacts on family functioning, parental stress, and quality of life. However, qualitative studies exploring the nuanced experiences and perspectives of caregivers remain relatively limited. This systematic review aimed to synthesize the available qualitative evidence to provide healthcare professionals with a deeper understanding of family needs and challenges.

Methods:
A systematic literature search was conducted in PubMed, Embase, CINAHL, and PsycINFO following PRISMA guidelines. Qualitative studies exploring caregiver experiences of children and adolescents (0-21 years) with OCD and tic disorders, including Pediatric Autoimmune Neuropsychiatric Disorders Associated with Streptococcal Infections (PANDAS), Pediatric Acute-onset Neuropsychiatric Syndrome (PANS), Tourette Syndrome and functional tic-like behaviors, were included. Data from the results sections of included studies were extracted and analyzed using thematic synthesis methodology. Quality assessment was performed using the modified Critical Appraisal Skills Programme.

Results and Conclusions:
21 studies were included. Through thematic synthesis, seven descriptive themes (healthcare journey, parental emotional journey and coping, understanding and meaning-making, impact on family life and daily routines, child symptom experience, school life, stigma and social support) and four analytical themes emerged: 1) Inadequate healthcare systems increase caregiver strain, 2) Navigating uncertainty and disruption of prior family life, 3) Seeking understanding and belonging, and 4) Bearing the hidden costs of caregiving. Both descriptive and analytical themes were shared across conditions, though condition-specific variations emerged. Analytical synthesis indicated that caregiver burden across conditions was consistently shaped by structural factors within healthcare systems, including delayed diagnostic clarification, fragmented care pathways, and limited disorder-specific expertise. Caregivers described a shift from a parental role towards that of a coordinator and advocate within the system, often requiring persistent effort to access appropriate care. At the family level, experiences were characterized by ongoing uncertainty and recalibration of daily life, with substantial impacts on family functioning, sibling dynamics, and parental roles. Caregivers actively engage in meaning-making processes and seek external validation and support in the context of limited professional guidance. This qualitative systematic review and synthesis demonstrates that caregivers of children with tic disorders and OCD face multifaceted challenges. The findings reveal significant system gaps and emphasize the need for improved professional recognition, earlier diagnostic pathways, and holistic treatment approaches addressing

both clinical symptoms and family well-being. Importantly, caregiver burden was not only driven by the child's symptoms but also by systemic barriers within healthcare systems. Healthcare professionals must acknowledge the profound family impact and develop comprehensive support systems, recognizing caregivers as essential partners in care.

P29. Tic disorders & OCD in childhood: a systematic review and qualitative synthesis

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Background:
Tic disorders and obsessive-compulsive disorder (OCD) in childhood are associated with substantial functional and psychosocial impact. However, clinical understanding is often based on observable symptoms and caregiver reports, with less emphasis on how children themselves experience and interpret these conditions. Qualitative research offers important insight into these subjective perspectives. This systematic review aimed to synthesize qualitative evidence on the lived experiences of children and adolescents with tic disorders and/or OCD to inform more child-centered clinical approaches.

Methods:
A systematic literature search was conducted in PubMed, Embase, CINAHL, and PsycINFO in accordance with PRISMA guidelines. Qualitative studies exploring the experiences of children and adolescents (0-18 years) with tic disorders and/or OCD were included. Data were extracted from the results sections of included studies and synthesized using thematic synthesis. Study quality was assessed using the modified Critical Appraisal Skills Programme.

Results and Conclusions:
A total of 11 qualitative studies were included. Seven studies represented children with tic disorders, while four involved children with OCD. Thematic synthesis identified nine descriptive themes. Of these, six were identified as shared themes experienced by both children with tic disorder and OCD (social experiences and stigmatization; a challenging school life; identity, self-perception and acceptance; the diagnostic process; parental reactions and triggers and calming factors), while two themes were specific for children with tic disorder (physical impact, urges and controlling tics and anger issues) and one theme uniquely among children with OCD (shame and secrecy).

Three analytical themes emerged: 1) living with the diagnoses is an ever-present battle, 2) understanding from others is foundational, and 3) navigating tics and OCD becomes easier over time. Through these three themes, it was clear that children's experiences were shaped by social environments, particularly within school and peer settings, where misunderstanding and negative reactions contributed to feelings of embarrassment, isolation, and being different. At the same time, supportive relationships were described as crucial in reducing distress. Our synthesis indicated that children continuously navigate the balance between managing internal symptom experiences and adapting to external expectations. This involved ongoing efforts to maintain normality by reducing visibility, enhancing control, and seeking social acceptance.
This qualitative systematic review and synthesis demonstrates that children with tic disorders and OCD experience their condition as a dynamic interplay between internal symptom processes and external social contexts.
The findings emphasize the importance of integrating children's perspectives into clinical care, with particular attention to symptom management strategies, social environments, and experiences of stigma. A more child-centered approach should support children's adaptive efforts, improve understanding within school and peer contexts, and extend beyond symptom reduction to enhance overall well-being.

P30. Why do clinical Trials fail in Tourette Syndrome? A Systematic Review and Meta-Research Analysis

Natalia Szejko, Simon Schmitt, Catharina Cramer, Wiktor Sliwinski, Ali Abusrair, Kirsten Müller-Vahl

Background:
A substantial proportion of clinical trials in Tourette syndrome (TS) fail to demonstrate superiority over placebo despite biologically plausible therapeutic targets. Understanding factors associated with trial failure is essential to improve study design and accelerate therapeutic development in this heterogeneous disorder.
Objectives: To systematically identify failed and inconclusive clinical trials in TS and to perform a meta-research synthesis examining methodological, clinical, and statistical features associated with these outcomes.

Methods:
A systematic search of PubMed/MEDLINE, Embase, and the Cochrane Library was conducted from inception to December 2025 in accordance with PRISMA guidelines. Randomized and blinded controlled trials (RCTs) in pediatric and adult TS populations were included if they reported negative, null, or mixed primary outcomes. Extracted variables included intervention class, trial phase, sample size, age group, trial duration, primary outcome

measure (most commonly the total tic score (TTS) of the Yale Global Tic Severity Scale, YGTSS), placebo response rates, and reported effect estimates. Instead, a quantitative descriptive and comparative meta-research synthesis was conducted to identify recurrent features across trials with negative or inconclusive findings.

Results:
The search identified 1,842 records, of which 34 controlled trials involving 4,657 participants were included in the final synthesis (median sample size 96, IQR 52–165). Overall, 59% of the trials failed to meet their primary endpoints, while 26% demonstrated improvements limited to secondary outcomes.
Late-stage failures were particularly prominent in pharmacological trials. Large placebo-controlled studies of vesicular monoamine transporter type 2 (VMAT2) inhibitors, including deutetrabenazine (ARTISTS 1–2) and valbenazine (T-Force GREEN), did not demonstrate significant superiority over placebo despite favorable tolerability. RCTs of atomoxetine, primarily conducted in patients with TS and comorbid ADHD, did not show consistent tic reduction despite efficacy for attentional symptoms. Similarly, a placebo-controlled trial of N-acetylcysteine in pediatric TS did not demonstrate significant improvement in tic severity.
Neuromodulatory trials of deep brain stimulation (DBS) targeting thalamic or pallidal regions demonstrated heterogeneous individual responses but lacked consistent group-level efficacy in blinded phases. Behavioral trials of biofeedback and relaxation-based interventions also did not demonstrate durable superiority over control conditions.
The meta-research synthesis identified several recurrent features across trials with negative or inconclusive outcomes, including high placebo response rates (>30%), phenotypic heterogeneity, short blinded follow-up durations, and reliance on outcome measures with limited sensitivity to fluctuating tic severity. Age-stratified analyses revealed systematic differences: trials in children were characterized by higher placebo response rates, greater symptom fluctuation, and higher comorbidity burden, whereas trials in adults demonstrated more stable tic phenotypes but remained limited by small sample sizes and outcome sensitivity.

Conclusions:
Failed and inconclusive clinical trials in TS occur in the context of both methodological challenges and the possibility of true lack of treatment efficacy. The present findings highlight several recurring trial characteristics that may contribute to negative or inconclusive results and should be considered when interpreting existing evidence.
Future studies may benefit from refined phenotyping, stratification by comorbidities and tic dynamics, improved outcome measures, and trial designs that better account for symptom variability. These considerations are particularly relevant in pediatric populations, where developmental factors may

further obscure treatment effects. Incorporating these principles may improve the ability of future trials to detect clinically meaningful treatment effects.

P31. A cross-sectional study of barriers to clinical implementation of guidelines in the assessment and treatment of persistent tic disorders

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Background:
Despite existing guidelines regarding the evaluation and management of persistent tic disorders (PTD) by the American Academy of Neurology (AAN) and the European Society for the Study of Tourette syndrome (ESSTS), considerable variability in clinical practice persists. The objectives of this study were to identify how clinical practices diverge from the guidelines and to identify categories of barriers to their implementation.

Methods:
A survey assessing practice preferences and perceived barriers to implementing guidelines was proposed to English-speaking clinicians with direct experience treating PTD, focusing on neurologists and psychiatrists. Experts were invited to participate through research networks, specialty clinics, and stakeholder organizations including the Tourette Association of America (TAA), Movement Disorder Society, AAN movement disorder community page, and the ESSTS newsletter. Differences in clinical practice were examined between child and adult specialists, as well as between U.S.-based and non–U.S.-based respondents.

Results:
In this survey of 81 healthcare professionals -predominantly movement disorders specialists and US-based respondents- we found that several aspects of clinical practice diverged from the AAN and ESSTS

recommendations. Only 35% of respondents reported using a standardized scale such as the Yale Global Tic Severity Scale to assess tic severity. Fewer than 75% routinely assessed mood disorders, disruptive behaviors, and suicidality, and fewer than 50% referred patients to local support groups. Behavioral therapy was prescribed as an initial treatment by 74% of respondents. Alpha-agonists were the most frequently chosen first-line pharmacological treatment. Most physicians reported not routinely ordering blood tests before or during treatment with dopamine D2 receptor antagonists (D2Rants). The main barriers to the implementation of the guidelines were structural, including the cost and availability of treatment. Additional barriers related more to individual physicians (prescribing preferences, variability in clinical knowledge and experience), and patients (concerns about potential side effects and efficacy). Prescription patterns differed as well (e.g. non-U.S.-based clinicians prescribing more D2Rants as first-line treatment for tics, and child specialists reporting less experience with botulinum toxin).

Conclusions:
Barriers to implementing existing guidelines include physician-related, patient-related and systemic factors. These should be sequentially targeted to improve wider dissemination of best practices.

P32. Hair-Based Assessment of Exo- and Endocannabinoids in Tourette Syndrome: Association with Clinical Phenotype and Cannabis-based Treatment

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Background:
Among other neurotransmitter systems, the endocannabinoid system (ECS) has been implicated in tic generation and modulation. Accordingly, cannabis-based medicines (CBM) have been suggested for the treatment of tics. An increasing number of controlled studies suggest efficacy of CBM in TS. However, objective biomarker data on exogenous and endogenous cannabinoids' activity in TS remain limited.

Methods:
We conducted a cross-sectional study including patients with (i) Tourette syndrome (TS) treated with CBM (n=17), (ii) TS without CBM (n=21), (iii)

attention-deficit/hyperactivity disorder (ADHD; n=20), and (iv) other neurological conditions with CBM treatment (n=11) compared to healthy controls (n=21). Hair samples were analyzed for different exocannabinoids and its metabolites (Δ9-tetrahydrocannabinol [THC], cannabidiol [CBD], cannabinol [CBN], and THC-COOH) and endocannabinoids (anandamide [AEA], 2-arachidonoylglycerol [2-AG], oleoylethanolamide [OEA], palmitoylethanolamide [PEA], stearoylethanolamide [SEA]), as well as cortisol and cortisone. Clinical assessments included YGTSS, PUTS, GTS-QoL, Y-BOCS, BDI-II, BAI, CAARS, and WURS-k. Group comparisons were performed using non-parametric tests.

Results:
In patients with TS, neither tic severity (YGTSS total tic score: 22.35 ± 8.58 vs 25.81 ± 7.37, p=0.264), nor other clinical symptoms (according to PUTS, GTS-QoL, Y-BOCS, BDI-II, BAI, and CAARS) did not differ between those with and without CBM.
In participants using CBM, concentrations of CBD ranged from 5.1 to 200 pg/mg while concentrations of the THC-COOH ranged between 0.006-17.0 pg/mg. THC-COOH were detected in the majority (81/90, 90%) of CBM-treated patients. In patients with CBM, concentrations of the THC metabolite THC-COOH ranged from 0.03 to 17.0 pg/mg, compared to low-level background values (0.006–0.62 pg/mg) in non-CBM groups.
Endocannabinoid levels showed marked variability across all groups, with OEA ranging approximately from 390 to >26,000 pg/mg, PEA from ~500 to >32,000 pg/mg, and SEA from ~700 to >5,000 pg/mg. No consistent group differences were observed between TS, ADHD, and controls.

Conclusions:
Endocannabinoid levels were highly heterogeneous and overlapped across groups, suggesting limited utility as standalone biomarkers. Furthermore, our data do not suggest a direct influence of CBM treatment on endocannabinoid levels as assessed in hair. Hair analysis reliably detected long-term exposure to cannabinoids, confirming CBM intake. In this study, CBM use was not associated with differences in tic severity or broader neuropsychiatric outcomes.

P33. A scoping review of psychoeducational interventions for Tourette syndrome and tic disorders

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Background:
Patients and their families often misunderstand tics, face inconsistent healthcare information, and struggle with uncertainty about what tics are. European guidelines recommend psychoeducation as a first-line intervention for tics, which aims to improve the patient's (and family's) understanding, coping, and management of tics. This review identifies what psychoeducational interventions for tics have been developed, their content and delivery, and their evaluation.

Methods:
We developed a scoping review protocol to identify and synthesise published literature and research-in-progress that: 1) reported the development and/or evaluation of a psychoeducational intervention for tics/tic disorders, 2) were aimed at individuals with diagnosed or suspected tics/tic disorders and/or their caregivers; and 3) were published up to April 2025, in English, in peer-reviewed journals. The search strategy was performed on MEDLINE, Embase, PsychINFO, PuBMed, Web of Science and CINAHL databases, and the ClinicalTrials.gov register to identify research-in-progress. Two reviewers (EBD, OH) led the search and screening process.

Results and Conclusions:
Twenty-four citations – reflecting 13 distinct completed studies and five in progress studies - were included. These were primarily conducted in the USA and Europe. Several studies evaluated the same psychoeducational intervention with different samples and contexts: 1) the BIP TIC Psychoeducation intervention, developed in England for the ORBIT trial and subsequently adapted for a Swedish trial; 2) group-based psychoeducation originally developed and trialed in the GOSH tic clinic was later evaluated against behavioural therapy, and subsequently translated and trialed in Israel; and 3) two trials used Psychoeducation with Supportive Therapy as a comparator for CBiT with children and adults respectively. Psychoeducation often served as a comparator/active control in evaluating behavioural and/or pharmacological therapy. Only three studies focused on psychoeducation as a primary intervention. Five studies in progress consist of RCTs where psychoeducation is the comparator against behavioural therapies. Most interventions were delivered or supported by a healthcare professional either in-person or online, and formats included individual sessions, parent-child sessions, group sessions, online modular programs and a boardgame. Thirteen studies targeted children and young people with tics, whereas four studies recruited adults with tics. Reporting of sociodemographic variables was limited; for those that did report data, most samples were predominantly white and male. Reporting of intervention content varied across publications, but commonly included information on tic phenomenology, co-occurring conditions, treatment options, coping skills, psychosocial issues, and guidance for caregivers. Some of the included

psychoeducation interventions deliberately omitted information about behavioural therapy to avoid crossover with the behavioural therapy being evaluated in the trial. All RCTs used the YGTSS as a primary outcome to assess tic severity. Psychoeducation often reduced tic severity, but behavioural therapy was associated with greater reductions. Further research is needed to evaluate the value and impact of psychoeducation, which parts are most effective, and to identify what non-tic related outcomes are important to assess in evaluating psychoeducation for tics.

P34. Childhood trauma, life events and clinical presentation in functional tic like behavior and Gilles-de-la-Tourette syndrome: preliminary data from a non-interventional clinical study

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Background:

Motor and vocal tics are the key symptoms in Gilles-de-la-Tourette syndrome (GTS), a hereditary, neurodevelopmental disorder with an early onset. In contrast to organic tics (OT) in GTS, functional tic-like behaviors (FTLB) are classified as functional movement disorders (FMD). Psychosocial stress, precipitating events and trauma as potential sign of altered emotion processing have been discussed in the genesis of functional motor disorders in general. The impact of stressful life events on the onset of OT in GTS is less investigated. The main goal of this study is to identify differences between GTS and functional tic-like behavior to allow clinical discrimination and consecutive adequate treatment. We expect both conditions to differ in clinical presentation, comorbidities and preceding psychosocial stressors.

Methods:

We conduct a cross-sectional, mono-center, non-interventional clinical study at the specialized outpatient clinic for Tourette and tic disorders at the University Clinic of Psychiatry and Psychotherapy in collaboration with the outpatient clinic for functional motor disorders at the University Clinic of Neurology. We expect to include 40 participants above 18 years with a primary diagnosis of either GTS or FTLB (20 patients per group). Patients are allocated to study groups according to the clinical diagnosis assigned in either of both outpatient clinics. Diagnostics is based on the ICD-10 classification criteria and the criteria for the clinical diagnosis for FTLB published recently (Pringsheim 2023). Participants undergo a single study visit for a clinical interview and questionnaires such as the Yale Global Tic

Severity Scale (YGTTS), the Montgomery Åsberg depression rating scale (MADRS) as well as a battery of additional questionnaires (questionnaire on autoaggressive behavior in GTS, childhood trauma questionnaire – short form, recent life events questionnaire (LEQ)). Due to the currently small sample size preliminary results are presented descriptively. Fisher's exact test was applied to analyze outcome parameters, when applicable.

Results:
Until March 2026, we included 11 out of the intended 40 patients (8 GTS, 3 FTLB) in the ongoing clinical study with a median age of 27 years (IQR 38). Gender distribution differed significantly between both diagnoses with 7 male GTS (1 female GTS patient) and 3 female FTLB patients (p=0.024). Comorbidities did not differ considerably between both tic disorders. Type of tic-onset (p=0.006), age at tic-onset (GTS: 7.71± 2.14 vs. FTLB 20.33± 6.66) and rostrocaudal progression (p=0.024) showed a significant difference between FTLB and OT. We investigated the CTQ (GTS: 55.29±9.16 vs. FTLB: 70.67±13.0), YGTSS (GTS: 55.0±10.66 vs. FTLB: 63.67±16.17), MADRS (GTS: 9.71±5.88 vs. FTLB: 16.33±5.69), the score on autoaggressive behavior (GTS: 5 (IQR 7) vs. FTLB: 16 (IQR 12)) and the negative life events before tic onset (GTS: -1.29±1.89 vs. FTLB: -10.0±2.65) between both tic disorders. Looking in detail at the symptomatic presentation (complex tics, blocking tics, tic bursts), no remarkable difference between FTLB and GTS was observed.

Conclusions:
Considering the preliminary nature of the data, the results should be interpreted with caution. However, childhood trauma and (negative) life events before tic-onset show initial indications to be associated with the occurrence of FTLB.

References:
Pringsheim T, Ganos C, Nilles C, Cavanna AE, Gilbert DL, Greenberg E, et al. European Society for the Study of Tourette Syndrome 2022 criteria for clinical diagnosis of functional tic-like behaviours: International consensus from experts in tic disorders. Eur J Neurol. 2023; 30(4): 902-10

P35. Examining the relationship between lifetime trauma and tic severity in children with Tourette Syndrome

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Background:
Tourette Syndrome (TS) is a complex, chronic disorder affected by a wide range of factors. This study aimed to describe the presence and nature of

traumatic events and post-traumatic stress disorder (PTSD) symptoms in TS patients and explore the relationship between traumatic events, PTSD, and tic severity.

Methods:
Data from the Child and Adolescent Trauma Screen (CATS) and the Yale Global Tics Severity Scale (YGTSS) were analyzed in 140 patients. Descriptive statistics were reported to characterize the patient sample, and a series of stepwise regression models were performed to test the relationship between the CATS and the YGTSS while correcting for age and presence of TS' common comorbidities Obsessive-Compulsive Disorder (OCD) and Attention Deficit Hyperactivity Disorder (ADHD).

Results and Conclusions:
Patients reported a greater number of traumatic events and higher PTSD severity compared to their parents' proxy reports. Patient self-reports demonstrated no significant relationship between traumatic experiences and PTSD with tic severity. However, parent proxy reports did demonstrate a significant relationship between trauma and tic severity. This difference may be driven by patients with the greatest number of traumatic experiences and highest trauma scores. The results flag a potential relationship between trauma and tic severity but highlight the need to focus data collection on patients with the highest trauma scores. Powering future studies to detect differences in this high vulnerability group will help orient findings toward clinically actionable conclusions. Furthermore, the significant relationship between the parent trauma ratings and tic severity became non-significance after accounting for OCD, showing that OCD severity was a stronger predictor of tic severity in this population.

P36. What do we currently know about functional tic-like behaviors: A topical review

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Background:

During the last 5 years, functional tic-like behaviors (FTLBs) have been the center of an increasing amount of scientific research. The purpose of this review was to collect this research and create an overview of what is currently known about the patient group.

Methods:
PubMed, EMBASE, and Web of Science were systematically searched for relevant papers, which were then sorted based on set inclusion and exclusion criteria. This process resulted in twenty-four papers selected for extraction, the results of which were summarized.

Results and Conclusions:
The results were split into three topics: characteristics, follow-ups, and treatment. Across studies on characteristics, patients with FTLB have overall higher symptom severity and complexity and a higher prevalence of anxiety and depression compared to the patients with Tourette syndrome included in the studies. The patients with Tourette syndrome had a higher prevalence of simple tics and comorbid attention-deficit/hyperactivity disorder and obsessive-compulsive disorder. However, in both populations there was considerable heterogeneity in both comorbidity profile as well as the characteristics of vocalizations and movements. The follow-up literature was relatively small but showed a general reduction in FTLB patients' symptoms over time, although spontaneous remission was rare. The treatment literature, which consisted of just two articles, showed good benefit of cognitive therapies. Overall, the FTLB patient group presents with a wide variety of symptoms, which tends to persist but responds well to cognitive treatment. More research is needed particularly within the treatment literature.

P37. Learning from lived experience: how young people's reports of living with functional tic like behaviours can shape service provision

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Background:
There is little research exploring the lived experience of young people with functional tic like behaviours (FTLBs) and the experience of their journey through services. Capturing the voice of these young people can help to shape service experience and inform assessment and intervention.

Methods:

Twelve young people with aged 13–24 with experience of FTLBs were recruited through third-sector organisations and online platforms, to take part in semi-structured interviews .The interviews covered the practical, physical, psychological, and social impacts of living with FTLBs. Data were analysed using Reflexive Thematic Analysis, which enabled the generation of themes that captured shared patterns as well as variations across young people's accounts.

Results and discussion:
Analysis identified four key themes: 'Life Upended' described the disruption and emotional distress that accompanied the onset of FTs. 'Help that Hurts' reflected unmet needs in healthcare, education, and wider systems, which often pushed young people toward online spaces for support. 'Under the Spotlight' captured the psychosocial consequences of sudden visibility and the perception of others' scrutiny. 'Coming to Terms' illustrated the young people's evolving relationship with FTs, encompassing adaptation, resilience, and ongoing struggle.
Based on this research, we reflect on the need for adaptations to service provision at a training, referral, assessment and intervention level to ensure this cohort receive care that is compassionate, containing and can meet their needs.

P38. Knowledge, Attitudes and Practices in Community Care for Pediatric Tourette Syndrome: A Multi-Methods Study

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Background:
Despite the availability of evidence-based guidelines, access to appropriate care for children and youth with Tourette syndrome and other tic disorders remains inconsistent. Community-based mental health providers play a central role in service delivery, yet little is known about their knowledge and confidence in managing tic disorders. This study aimed to evaluate knowledge, attitudes, and practices (KAP) related to pediatric tic disorders among community mental health clinicians in Alberta, Canada, and to identify key barriers and facilitators to implementing evidence-based care.

Methods:
We conducted a multi-methods study using a KAP survey distributed to community-based nurses, psychologists, and social workers across Alberta. Knowledge was assessed using structured items focused on evidence-based assessment and treatment of tic disorders. Open-ended questions explored

attitudes, clinical practices, and perceived barriers and facilitators. Quantitative data were summarized descriptively, while qualitative responses were analyzed using directed content analysis.

Results and conclusions:
A total of 243 clinicians participated. Confidence in knowledge of tic disorders was variable and generally lower than expected for core aspects of care. High proportions of respondents reported uncertainty regarding pharmacological management, as well as aspects of natural history and diagnosis. Use of standardized assessment tools for tic disorders was low across all professional groups. Qualitative findings identified three major barriers to care: (1) limited clinician training and lack of disorder-specific psychoeducation; (2) systemic constraints, including insufficient funding, limited access to trained providers, and long wait times; and (3) patient- and family-level challenges, including stigma, limited insight, and difficulties engaging in therapy. Participants emphasized the need for increased access to specialized training, improved system coordination, and development of accessible psychoeducational resources for families and youth. These findings highlight significant gaps in knowledge and system capacity that hinder delivery of evidence-based care for pediatric Tourette syndrome. Targeted educational initiatives and system-level interventions are needed to improve access, clinician confidence, and quality of care.

P39. Lessons learned from including Patient and Public Involvement members throughout research projects in remote Tic Disorder Research

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Background:
Shared and reflective practice when conducting Patient and Public Involvement and Engagement (PPIE) with underserved communities requires collaborative practice to support nuanced understanding in how to best involve public contributors across the lifecycle of a research project. Researchers within the research group, MindTech, at the University of Nottingham, UK, conducted three studies with the aim of informing change to healthcare services for people living with tics, and to develop solutions to current inadequacies in treatment provision. Each group had an individual PPIE panel. This included: 1) 'Tourette's: Hear Us' – a qualitative study

exploring people's experiences accessing healthcare for tics; 2) INTEND (IMPROVING TIC SERVICES IN ENGLAND) – a study to develop a care pathway for children and young people with tics and 3) ORBIT-UK (ONLINE REMOTE BEHAVIOURAL INTERVENTION FOR TICS UK) – a study to transform an online behavioural intervention for tics into a digital treatment implemented within the National Health Service. We present these three case studies of how PPIE has been conducted in an underserved research area into tic disorders, and we reflect key learnings from these approaches.

Methods:
PPIE panels were actively involved across all stages of the research cycle, including project design, recruitment, data collection, interpretation, and dissemination. Research teams reflected on their learnings from working with these PPIE groups to categorise and report them appropriately, and exchange learnings with other researchers. Online meetings between researchers enabled discussing the progress of PPIE, and identifying shared and differing learnings to collectively improve our work going forward.

Results and Conclusions:
Our key learnings, which have been mainly developed through challenge and resolution, are presented across the included case studies. These learnings have included the importance of valid, representative members within PPIE groups to ensure safe spaces to share varied and representative lived experience perspectives. Methods to improve inclusive ways of working were identified which supported PPIE members to effectively share their thoughts and feedback, whilst enhancing group dynamics. Engagement was further identified as a key element in our reflections, with methods that encourage continuous feedback from the group and working to PPIE members' availability to ensure sustained interest and membership within the PPIE panels.
This paper provides new insights into how underserved communities can be meaningfully engaged as research partners. These learnings can be implemented to extend beyond tic disorders, offering transferable methodologies to strengthen PPIE, whilst working with groups remotely in neurodevelopmental research.

P40. Shared Experience, Shared Support: Evaluating Peer Mentors in Tic Therapy Group

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Background:
The TANDeM service at the Evelina London Children's Hospital runs a four session, on-line tic therapy group incorporating Habit Reversal Therapy, Exposure Response Prevention, relaxation, externalised attention and acceptance strategies. Each group is attended by a peer mentor, a young adult with Tourette syndrome, who contributes to the group via question and answer sessions, advice giving and sharing personal experience. The aim of this investigation is to gain service user feedback on the impact of the peer mentor involvement.

Methods:
Five children who had previously attended the tic therapy group were invited to take part in a focus group to evaluate the involvement of a peer mentor in their group. The focus group used a mixed methods approach, including a survey and group discussion. Thematic analysis was used to evaluate the themes which arose as part of the group discussion.

Results and Conclusions:
The key themes that emerged from the thematic analysis were: "helpful advice and shared experience"; "feeling less alone"; "relatability and understanding"; "hope for the future" and "acceptance". The survey results showed that most children felt that the peer mentor helped them feel more comfortable about their tics and made them feel less alone, but did not necessarily make them worry less about their tics or give them increased confidence in managing their tics, over and above the strategies taught. In conclusion, the focus group indicates that a peer mentor contributes added value to a tic therapy group for the children more specifically around diagnosis acceptance and giving a sense of community.

P41. The Role of Pain in Psychological Functioning and Quality of Life among Youth with Tic Disorders

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Background:
Pain is a frequently reported yet under-researched aspect of functioning in individuals with tic disorders. While tics are mainly viewed as motor and vocal phenomena, their somatic effects – such as muscle strain and discomfort – may lead to broader psychological issues and a lower quality of life. Despite clinical observations, the impact of pain on the psychosocial functioning of young people with tic disorders is not well understood. This study aims to explore the relationships between pain, tic severity, depressive

symptoms, anxiety (state and trait), resilience, and multidimensional quality of life.

Methods:
A cross-sectional sample of children and adolescents diagnosed with tic disorders (N = 46; age range: 12–17 years, M = 14.38, SD = 1.90) was assessed using standardised tools. Tic severity was measured with the Yale Global Tic Severity Scale (YGTSS). Depressive symptoms were evaluated using the Children's Depression Inventory 2 (CDI-2), which assesses emotional, cognitive, and behavioural components. Anxiety was measured with the State-Trait Anxiety Inventory (STAI/STAIC), differentiating state and trait anxiety. Resilience was assessed using the Short Psychological Resilience Scale (SPP-25). Quality of life was measured through the KIDSCREEN questionnaire, covering physical health, psychological well-being, self-perception, autonomy, family and peer relationships, school environment, and social acceptance. Pain was evaluated through current and usual (habitual) pain. Pearson correlation analyses were conducted to explore associations among the variables.

Results:
Pain was consistently and moderately associated with tic severity (YGTSS; r=.45–.47, $p < .01$). Both current and usual pain showed strong positive associations with depressive symptoms across all subscales (r=.32–.61, all $p < .05$), with the most significant effects for emotional and cognitive components. Pain was significantly related to trait anxiety (STAI/STAIC; r up to .70), but not to state anxiety. Notably, pain exhibited strong negative associations with quality of life across all domains. These were especially marked for usual pain (r up to –.68, $p < .001$), impacting physical and emotional well-being, self-perception, independence, social relationships, and school functioning. Resilience did not show a consistent relationship with pain, indicating it does not mediate the connection between psychological distress and pain.

Conclusions:
Pain is a clinically significant correlate of both tic severity and psychosocial functioning in young individuals with tic disorders The findings suggest that pain may constitute a key pathway linking tic severity with depression and reduced quality of life. These results highlight the importance of systematically assessing and addressing pain in clinical and research contexts, as it may represent an underrecognized target for intervention.

P42. Are impulsions impactful? A single centre UK case note review of the movements seen in Tourettic OCD and their clinical significance

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Background:

Neurodevelopmental disorders, such as Tourette Syndrome (TS) and Obsessive Compulsive Disorder (OCD), are overlapping syndromes. Intermediate phenotypes are increasingly recognised and a new framework for understanding these presentations has been proposed. Tourettic OCD (TOCD) is conceptualised as an intermediate neuropsychiatric presentation with movements that have characteristics of complex motor tics and compulsions, named impulsions (Katz et al., 2022). Impulsions are driven by somatosensory urges, not obsessions. They involve “just right” experiences, related to symmetry, exactness, or completeness (Neal & Cavanna, 2013). Movements involve touching, tapping, evening-up, or repeating actions; with a lower prevalence of contamination fears, checking, and reassurance seeking than compulsions (Mansueto & Keuler 2005; Katz et al, 2025). Little is known about the frequency and clinical significance of impulsions.

Methods:

This single-centre case note review was conducted at the Tic Service, Great Ormond Street Hospital, London. Inclusion criteria were patients aged under 18 years diagnosed with TS by a Consultant Neuropsychiatrist between October 2024 and October 2025. Demographic data, co-occurring neurodevelopmental and mental health disorders, and the presence of impulsions were recorded. Patients were divided into two groups, those with TS and impulsions (“TOCD”) and those with just TS (“TS-only”). The primary outcome was functional impact, measured using the Children’s Global Assessment Scale (CGAS). Secondary outcomes included comparison between groups of demographic and neurodevelopmental disorders, and tic severity measured by the Yale Global Tic Severity Scale (YGTSS).

Results:

A total of 66 children were included. Just over half (54%) of children diagnosed with TS also had impulsions. There was no significant difference between groups for rates of co-occurring neurodevelopmental or psychiatric disorders. When controlling for the sex distribution of the sample, the TOCD group was found to have a male-to-female sex ratio of 1.17:1. In comparison, the TS-only group had a sex ratio of 2.1:1.

Despite the high occurrence of impulsions, a paired two-sample t-test did not show a significant difference in CGAS between the groups (TOCD: M=48.4±10.5; TS-only: M=53.3±11.2; t=1.27; p=0.21). Children with TOCD were significantly more likely to have a complex tic disorder when measured via the YGTSS total score and severity score for complexity for both motor and phonic tics (see Table 1).

Conclusions:
Impulsions occur frequently in children with TS in specialist services. Children with TOCD are more likely to have severe and complex tic disorders. Impulsions are not impactful when measured using the CGAS. The CGAS assesses general functioning and may not be specific enough to distinguish the impact of impulsions between groups that both have a high level of complexity with respect to other neurodevelopmental and psychiatric disorders.
Interestingly, the sex ratio of children with TOCD was between that observed in the TS-only group and reported sex ratios for children with OCD (e.g., 1:1; Geller 2006). This may lend weight to an understanding of Tourettic OCD as an intermediate phenotype.

P43. Growing Proficiency in Tic Disorder Care and Skills (GP-TiCS)

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Background:
Many people with tic disorders report negative experiences accessing support in the UK. Limited awareness and understanding of tics within frontline (primary care) services often leads to delayed recognition. Living with tics is an individualised experience, impacting people and families in many ways. However, the resources available to general practitioners (GPs) about tic disorders during their medical training are limited, creating challenges when frequently co-occurring disorders share symptomology or the daily impact is not well understood. The GP-TiCS project aims to explore the experiences of people accessing care and professionals delivering care for tics in primary care. By identifying these gaps and co-developing time-efficient, clinically useful learning resources, this project aims to equip GPs with the knowledge and confidence needed to better support people with tics.

Methods:
This project began with a systematic review exploring the experiences of people accessing care for tics and clinicians delivering care for tics in primary care, before conducting interviews with similar groups to

understand perspectives more locally in England. In collaboration with Tourettes Action we evaluated their resource which was developed specifically for GPs to improve their understanding of tics. Through two workshops with GPs, we gathered feedback on its content and formatting and implemented these modifications. With the newly modified resource, we are now conducting a feasibility repeated measures knowledge survey study with GPs to understand the user experience of the resource, and whether it could improve their knowledge and confidence with tics. A subsample of participants are being invited to interview for a more in-depth understanding of whether the resource is time-manageable and could impact their future clinical practice.

Results and Conclusions:
The systematic review explored primary care experiences in the UK and beyond, which concluded that lack of tic knowledge, resulting in stigma and misinterpreted symptoms, is a concern reciprocated in many countries. Subsequent interviews with patients revealed that poor healthcare experiences resulted from a perceived lack of understanding of tics and occasional dismissal of experiences. Interviews with GPs revealed that they experienced a lack of confidence around tic disorders, while an unclear pathway and unavailability of support services presented referral challenges. Employing Tourettes Action's online learning resource, feedback in the GP workshops was positive with some example recommendations including videos of tics being displayed, reducing the amount of text, including links to additional patient resources, and questions that may be useful to ask in clinic. The feasibility study is ongoing but preliminary data suggests that the resource to be acceptable with some minor changes to formatting and may support GPs to more confidently disentangle tics from commonly co-occurring disorders. This systemic issue is cyclical, where even if one area is addressed, improvement in another is necessary before changes can be felt by people seeking care. GPs are the gatekeepers for referring onto services that can treat tics, and with a recent NICE recommendation for a digital tool for tics (ORBIT) in the UK, it has never been so important that GPs are able to make these referrals confidently.

P44. Cognitive flexibility training in TS adult patients with OCD

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Background:

Among TS comorbidities, OCD is one of the most common disorders. Typical comorbid OC components in TS are related to sensory perceptions or the perception of certain sounds as bothersome or involving order and symmetry. Cognitive rigidity is often present, linked to poor attentional shifting skills. According to recent evidence, creative thinking (CT) may represent a resource for managing symptomatology and promoting flexibility. Specifically, it is highlighted that in everyday-life CT is useful to manage critical situations, adopting new perspectives, and finding alternative strategies to moderate the subjective perception of the impact of tics, thus contributing to patients' well-being.

Methods:
The study reports the effects of an online training involving activities based on CT and designed to stimulate cognitive flexibility in adult patients with TS and OCD. Twenty-two patients were assigned to either the training (n = 11) or the passive control condition (n = 11), with groups balanced for gender, age, schooling, and clinical severity. The training was composed of 6 individual sessions once a week (40 minutes each one). In every session, 4 progressively complex everyday-like and symptom-related scenarios were proposed. Metacognitive hints and a final discussion were scheduled for each session to reflect on the strategies to solve scenarios and promote generalization. An assessment battery was proposed pre- and post-training (i.e., T0, T1) encompassing tools evaluating clinical severity (YGTSS, Y-BOCS, BDI-II, and BAI), CT (Alternative Uses Test, Lines Test, and Compound Remote Associate problems), and cognitive flexibility (Alternate Fluencies, Modified Five Point Test, and Wisconsin Card Sorting Test). Synchronous online sessions were conducted both for the assessment and the training. To analyze the effects of the intervention on subjective tic severity, a linear mixed-effects model was conducted with YGTSS Impairment subscale scores as the dependent variable, Group (training vs. control), Time (T0 vs. T1), and their interaction as fixed effects, and participant as a random intercept. Baseline tic severity (YGTSS objective subscale scores at T0) was included as a covariate.

Results and Conclusions:
The model revealed a significant Group × Time interaction on YGTSS Impairment subscale, controlling for baseline YGTSS objective subscale. Participants in the training group showed a greater reduction in YGTSS Impairment subscale over time compared to controls ($\beta = 5.00$, SE = 2.18, $p = .033$). No other clinical, CT, or cognitive flexibility measures showed significant changes. Moreover, the training was perceived as moderately beneficial by participants and was completed with interest and motivation by them.
These findings suggest that the proposed CT-based intervention may contribute to reducing the subjective experience of tics in adult patients with TS and OCD when accounting for initial symptom severity. This supports the

potential utility of using CT for stimulating cognitive flexibility and metacognitive processes as a complementary approach to standard treatments, for modulating TS with OCD patients' subjective perception of tic-related impairment.

P45. Pilot Evaluation of Teacher-Assisted Tic Therapy for a Child and Family with Multiple Health Needs - A Widening Access Initiative

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Background:

Co-occurring neurodevelopmental and/or mental health conditions are heightened in children with tic disorders. Unfortunately, evidence highlights how children with multiple, complex or chronic needs are more likely to experience multiple barriers of access to care, including delays in accessing support and lack of staff training and/or confidence for managing aspects of difference (Webb, 2024). These disparities in access are also likely to be further compounded for children from racially minoritised backgrounds (Vincent et al., 2025). The hereditary nature of neurodevelopmental conditions means that parents/carers may also present with their own neurodevelopmental needs - whilst also facing a heightened risk of mental health challenges in parallel (Case et al., 2025). This is crucial to acknowledge since parents/carers are typically encouraged to support their children over the course of psychological interventions for tics, by enabling them to regularly practice tic management strategies between sessions (Verdellen et al., 2011). Thus, if services fail to recognise and *accommodate* the needs of a child and their wider family, this risks adversely impacting the quality of care being received.

The TANDeM Service is committed to identifying and addressing such disparities in care to improve equitable access. Therefore, this case study aims to illustrate how we adapted our clinical approach to accommodate the multiple, intersecting needs of a young person with Tourette syndrome and their wider family. Additional support was also utilised via the young person's educational system, to enable them to remain able to access ongoing psychological therapy for managing tics.

Methods:

A 14-year-old male with Tourette syndrome, autism, and ADHD was offered psychological therapy for managing tics. However, the family's multiple

health needs adversely impacted on their ability to adhere to the treatment plan (including regular practice between sessions). Positively, the young person reported their school (i.e., a Special Educational Needs provision) to be a highly enjoyable environment. Following consultation with the family and school, all parties agreed to support the young person to access ongoing psychological therapy whilst at school. Adapted treatment components included tic psychoeducation for teaching staff, who also supported the young person to regularly practice strategies learned between sessions.

Results and Conclusions:
Results - including outcome measures and qualitative feedback from the young person, parent(s) and teacher(s) - will be available to present at the ESSTS conference.

P46. Tic Attire: Exploring Tic-Related Pain, Injury and the Co-Design of Protective Clothing

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Background:
Tic-related pain and injury (TRPI) in Tourette syndrome (TS) and related tic disorders can significantly limit participation in daily activities. Pain often results from repetitive, forceful movements and environmental interaction, including neck and limb hyperflexion, object-directed tics (e.g. hitting surfaces), and self-directed behaviours such as self-hitting. These may lead to acute injury (e.g. bruising, soft tissue damage) and chronic musculoskeletal pain, particularly in the cervical spine. Despite this, few non-pharmacological interventions exist to reduce physical harm. The Tic Attire project explores the feasibility of co-designed protective clothing to reduce injury without restricting movement or suppressing tics.

Methods:
An online survey examined TRPI experiences, healthcare use, coping strategies, and design priorities. It was distributed nationally via Tourettes Action and locally through a Surrey support group. A total of 147 respondents participated: adults with tics (n=98), young people under 18 (n=21), and parents/carers (n=28). Findings informed development of an initial protective hoodie prototype.

Results:

TRPI were highly prevalent: 141 respondents reported pain, with only one reporting none. Pain occurred occasionally (n=32), frequently (n=63), or almost constantly (n=45), with a mean severity of 6.08/10. Commonly affected areas were the neck (87%), head (57%), shoulders (57%), face (45%), and hands (42%). TRPI impacted multiple life domains, particularly sleep and rest (83%), social activities (74%), leisure (63%), activities of daily living (61%), and education (60%). Healthcare use was common, including GP visits (35%), A&E (25%), minor injury services (20%), and pharmacies (15%). Management strategies included over-the-counter medication (55%), activity avoidance (44%), padding/layered clothing (42%), and heat therapy (41%). Interest in protective clothing was moderate to high (mean 3.53/5). Key priorities were comfort (72%), pain reduction (55%), injury prevention (46%), affordability (40%), and discreet design (35%).
Survey findings informed the co-production of a padded hoodie prototype targeting high-risk areas, including the hands and neck, designed to be comfortable, discreet, and sensory-informed. A key priority identified by participants was that the garment should not appear medical or clinical; therefore, the hoodie is intentionally styled to resemble everyday clothing. Features include a discreet, hidden inflatable pillow to reduce range of hyperextension during head and neck tics, which can be replaced with a higher-density foam insert for individuals experiencing more rapid or forceful tics. Additional elements include soft tactile features to provide external sensory feedback, chewable components to support reduction of vocal tics, and removable padded inserts. The cotton-lined fleece fabric supports temperature regulation, is machine washable, and enhances overall comfort and wearability. The prototype will be shared at face-to-face Tourette support groups to gather feedback and inform further refinement and future long-term trials.

Conclusions:
TRPI are common and significantly affect wellbeing, healthcare use, and participation across rest, productivity, and social domains. Co-designed protective clothing may offer a promising harm-reduction approach that supports safety and occupational engagement without aiming to suppress tics. Further development and evaluation will assess feasibility and effectiveness.

P47. Making Work Work for Tourette syndrome: Developing a Strengths-Based Employment Passport

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Background:
Adults with Tourette syndrome (TS) frequently experience barriers to obtaining and sustaining employment despite bringing valuable strengths to the workplace. Current research indicates lower employment rates, experiences of stigma and misunderstanding of tics. To inform the development of a practical workplace support resource, Tourette's Action's (TA) Therapies and Advocacy service conducted a survey exploring employment experiences, strengths, challenges and adjustment needs among adults with TS.

Methods:
A mixed methods online survey was distributed through TA networks to adults with TS or related tic conditions. The survey explored employment status, workplace strengths, tic-related challenges, sensory and executive functioning factors, physical impacts including pain and fatigue, compulsions, and workplace adjustments. Quantitative descriptive statistics and qualitative responses were analysed to identify themes relevant to workplace support and the development of a Tourette's Employment Passport (TEP).

Results:
A total of 152 responses were received from across the UK. Most respondents were employed full-time (48.7%) or part-time (25.7%). Participants reported strengths including empathy (63.8%), attention to detail (59.9%), creativity (56.6%), honesty and direct communication (55.3%), problem-solving (52.6%) and strong focus on areas of interest (53.3%). Respondents described workplace challenges linked to tic expression, sensory environments, executive functioning and fatigue. Meetings or group settings (25.0%), being observed by others (17.8%) and social interactions (14.5%) were commonly reported situations where tics affected comfort at work. Sensory factors affected 77.6% of participants, particularly noise (61.8%), temperature (46.1%) and lighting (43.4%). Executive functioning challenges included task initiation (56.6%), emotional regulation (40.8%), planning and prioritising (40.1%) and task switching (41.4%).
Physical consequences of tics were common, with 46.1% reporting pain or fatigue often and 43.4% sometimes. Compulsions were reported by 57.9% of participants. Helpful adjustments included regular rest breaks (54.6%), flexible workspaces or home working (44.7%), movement breaks or fidget items (42.8%), noise-reducing headphones (40.1%) and flexible working hours (32.2%). However, many respondents reported that reasonable adjustments had not yet been offered. Participants rated the impact of tics on their ability to work at their best as 6.3/10 and feeling safe to be themselves at work as 5.95/10.
Findings from this survey are informing the development of the TEP, a personalised resource designed to support individuals in communicating

their strengths, support needs and helpful adjustments. The TEP is currently being refined with adults with TS through focus groups and TA Adult Advisory Panel input.

Conclusions:
Findings highlight the complex interaction of neurological, sensory, cognitive and environmental factors influencing employment participation in adults with TS. Alongside strengths, participants reported barriers including tic visibility, fatigue, compulsions, sensory environments and executive functioning demands. A strengths-based TEP may improve communication with employers, access to adjustments and workplace understanding. This occupational therapy-led initiative aims to support sustainable employment and inclusion.

P48. Awareness, perception, and attitude of school teachers regarding Tic disorders and Tourette Syndrome in Sokoto, Nigeria

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Background:
Tic disorders and Tourette Syndrome (TS) are childhood-onset neurodevelopmental conditions that can affect academic and psychosocial functioning. Teachers play a key role in early identification and classroom support; however, limited awareness and misconceptions may contribute to stigma, delayed recognition, and poor educational outcomes, particularly in low- and middle-income settings.
Objectives
To assess teachers' awareness, perceptions, and attitudes toward tic disorders and Tourette Syndrome, and to identify challenges encountered in classroom management.

Methods:
A descriptive cross-sectional study was conducted among 254 teachers in public and private kindergarten, primary, and secondary schools in Sokoto (September 2025–February 2026). Participants were selected using a multistage sampling technique involving random and systematic sampling methods. Data were collected using a structured self-administered questionnaire distributed through Google Forms and analyzed using IBM SPSS version 24. Descriptive statistics were used to summarize findings.

Results:

A total of 254 teachers participated in the study (mean age ± 35.4 years), minimum age 19 while the maximum was 58 years respectively. Participants were females 166 (65.4%), and the majority taught at the primary school level 163 (64.2%). Awareness of tic disorders and TS was generally low, with 183 (73.5%) teachers reporting they had never heard of the conditions. Among those aware, the internet and social media were the commonest sources of information 38 (57.6%), over half of respondents 132 (52.0%) were unsure whether tics were controllable by affected children. Most teachers supported inclusive education and classroom understanding for students with TS. Despite limited knowledge, attitudes toward inclusive education were largely positive, and most teachers 215 (84.6%) expressed willingness to attend training programs. Reported lack of trained special education teachers and absence of formal school policies.

Conclusions:
Teachers in Sokoto demonstrated poor awareness but relatively positive attitudes toward tic disorders and Tourette Syndrome. Targeted training, awareness initiatives, and inclusive educational policies are essential to enhance support for affected children.

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