

neuren

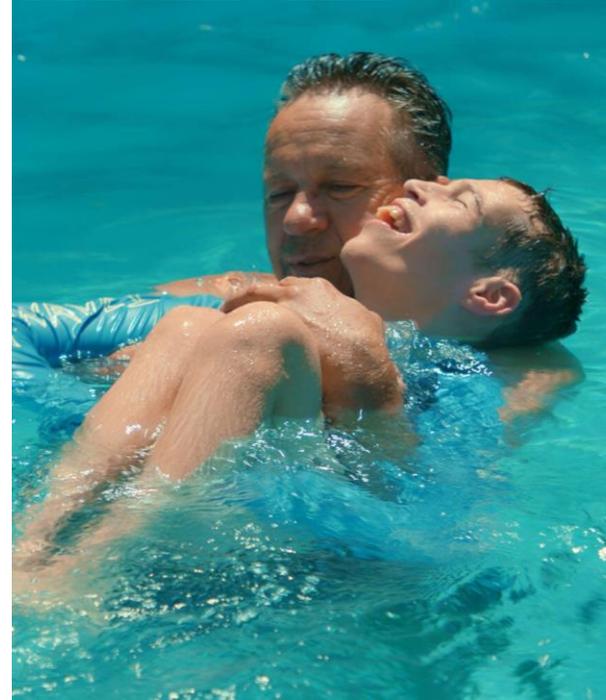
pharmaceuticals

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# Investor Presentation

15 May 2024

IMPROVING THE LIVES OF PEOPLE WITH  
NEURODEVELOPMENTAL DISABILITIES



# Forward looking statements

This presentation contains forward looking statements that involve risks and uncertainties. Although we believe that the expectations reflected in the forward looking statements are reasonable at this time, Neuren can give no assurance that these expectations will prove to be correct. Actual results could differ materially from those anticipated. Reasons may include risks associated with drug development and manufacture, risks inherent in the regulatory processes, delays in clinical trials, risks associated with patent protection, future capital needs or other general risks or factors.



# Leadership in neurodevelopmental disorder therapy development

Developing new therapies for debilitating neurodevelopmental disorders that emerge in early childhood and are characterised by impaired connections and signalling between brain cells



World's **1<sup>st</sup> and only** approved therapy for **Rett** Syndrome<sup>1</sup>

Clinical development in **5 more** neurodevelopmental disorders, all with **Orphan Drug** designation, with no existing approved therapies<sup>2</sup>

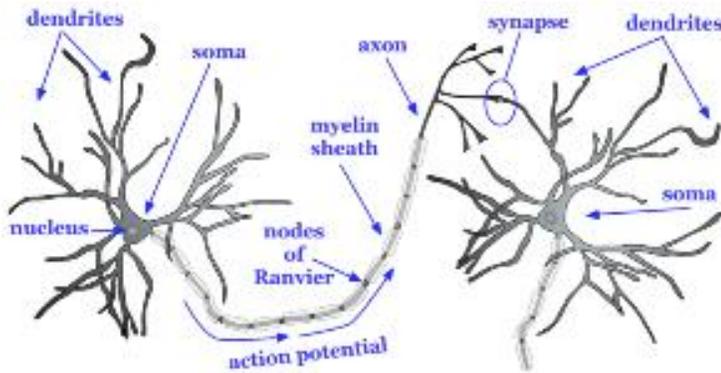
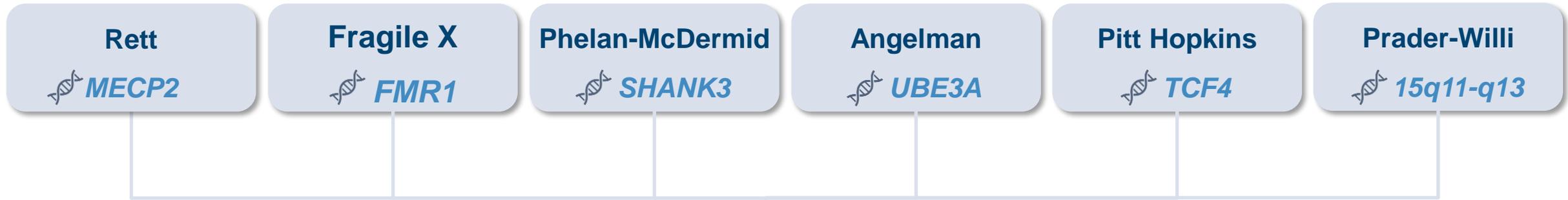
**no royalties payable to 3<sup>rd</sup> parties**

Incorporated in New Zealand, based in Melbourne, Australia, listed on ASX (Code: NEU)

<sup>1</sup> Currently approved in US only

<sup>2</sup> Except growth hormone to treat some aspects of Prader-Willi syndrome

# Seeking a ground-breaking impact on neurodevelopmental disorders



Impaired communication between neurons, abnormal formation/pruning of dendrites & chronic inflammation

## Neuren's drugs

target the critical role of **IGF-1** in this upstream process, using analogs of peptides that can be taken orally as liquids

## Severe impact on nearly every aspect of life

walking and balance issues  
Impaired communication  
impaired hand use

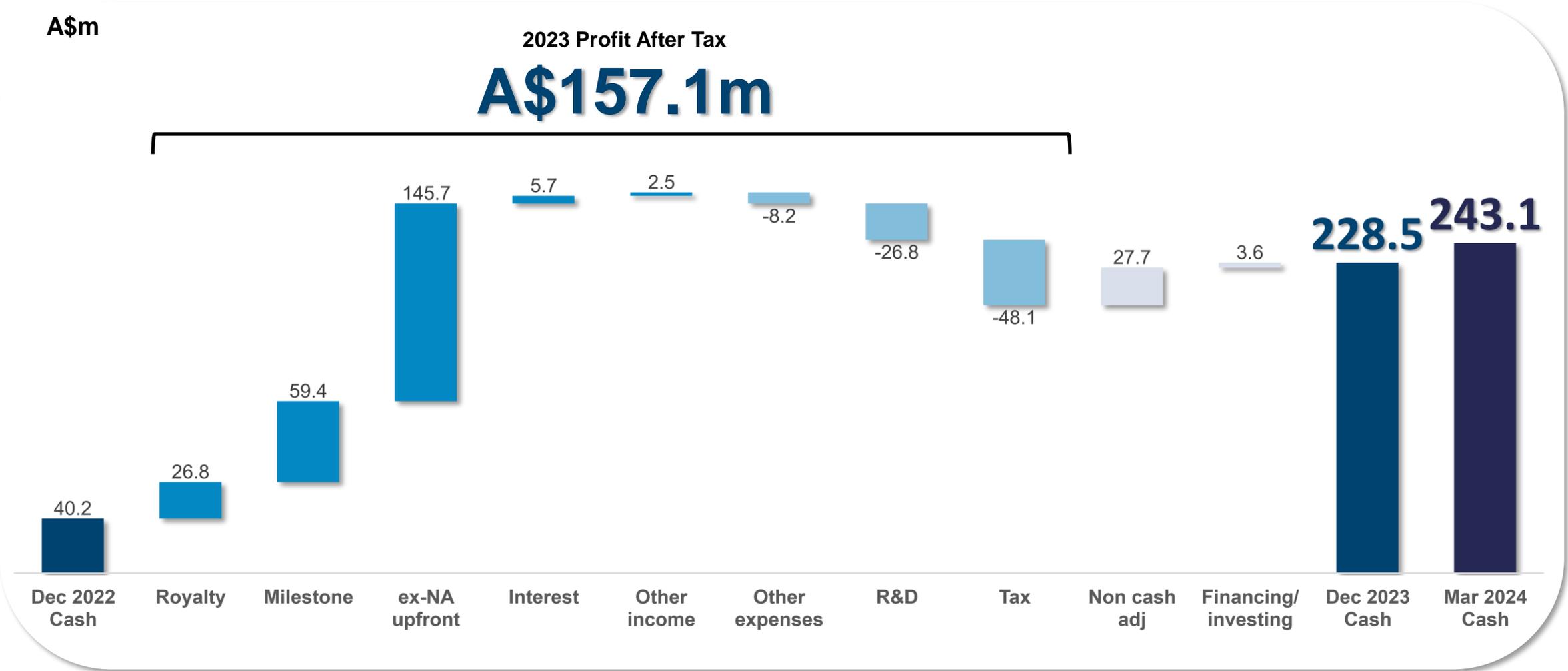
anxiety and hyperactivity  
intellectual disability  
sleep disturbance

seizures  
Impaired social interaction  
gastrointestinal problems

# Commercial and late-stage pipeline

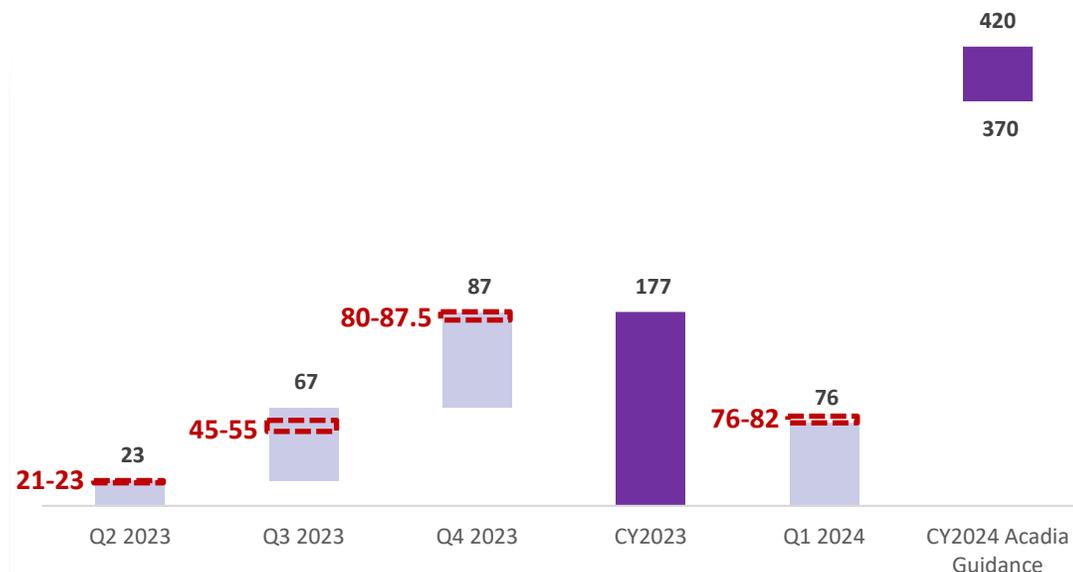
Indication	Compound	Geography	Preclinical	Phase 2	Phase 3	Registration	Commercial rights
Rett	Trofinetide	US	[Progress bar]				Daybue™ (trofinetide)
	Trofinetide	RoW	[Progress bar]				
	NNZ-2591	World	[Progress bar]				ACADIA
Fragile X	Trofinetide	World	[Progress bar]				
	NNZ-2591	World	[Progress bar]				
Phelan-McDermid	NNZ-2591	World	[Progress bar]				Positive Phase 2 results
Pitt Hopkins	NNZ-2591	World	[Progress bar]				Phase 2 top-line results in Q2 2024
Angelman	NNZ-2591	World	[Progress bar]				Phase 2 top-line results in Q3 2024
Prader-Willi	NNZ-2591	World	[Progress bar]				
Undisclosed Indications	NNZ-2591	World	[Progress bar]				

# Financial strength to maximise growth opportunities



# Growing sustainable income from commercialised product

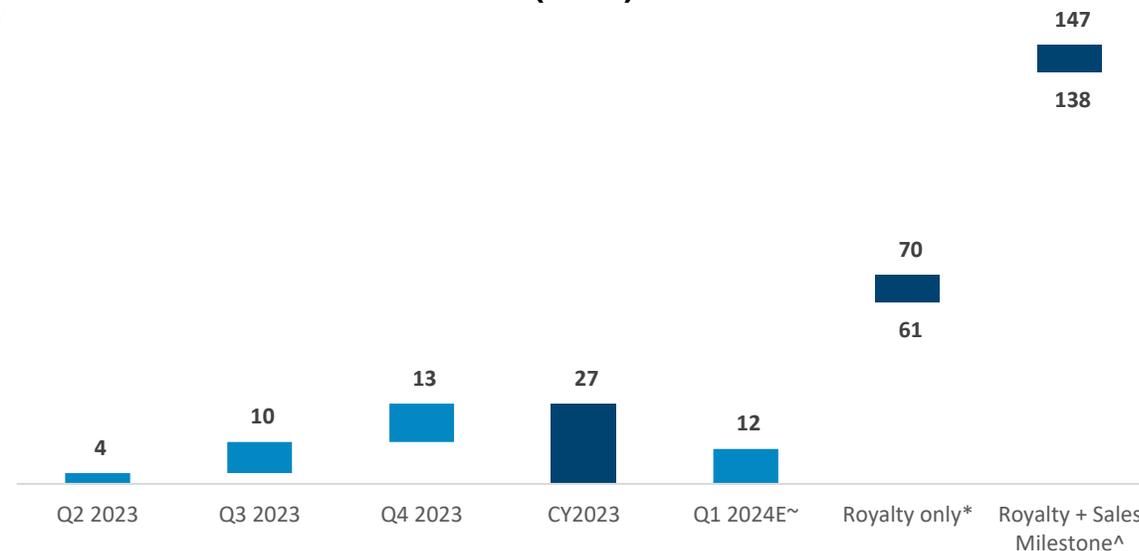
DAYBUE Net Sales (US\$m)



# Historical Acadia guidance

**2023 net sales of US\$177m**  
**2024E net sales of US\$370 – 420m**

Royalty and Sales Milestone Payments to Neuren (A\$m)



CY2024

**2023E royalty of A\$27m**  
**2024E royalty of A\$61 – 70m, plus A\$77m sales milestone**

~ Based on 10% of DAYBUE net sales and AUDUSD of 0.652294

\* Based on 10% of DAYBUE net sales up to US\$250m and 12% of DAYBUE net sales between US\$250m and US\$500m, and AUDUSD of 0.65

^ Neuren will be entitled to US\$50m sales milestones (receivable in Q1 2025) if CY2024 DAYBUE net sales reaches US\$250m; assumes AUDUSD of 0.65

# Three key drivers transforming near term value

**1** Realise Neuren's share of **trofinetide value in the US** through Acadia's successful commercialization of



**2** Realise Neuren's share of **trofinetide ex-US** value through expanded global partnership with Acadia

**3**

Confirm efficacy of **NNZ-2591** in Phase 2 trials for multiple indications, with global rights retained by Neuren

- ✓ Positive top-line results for **Phelan-McDermid syndrome**
  - Top-line results for **Pitt Hopkins** and **Angelman syndromes** in **Q2** and **Q3 2024**



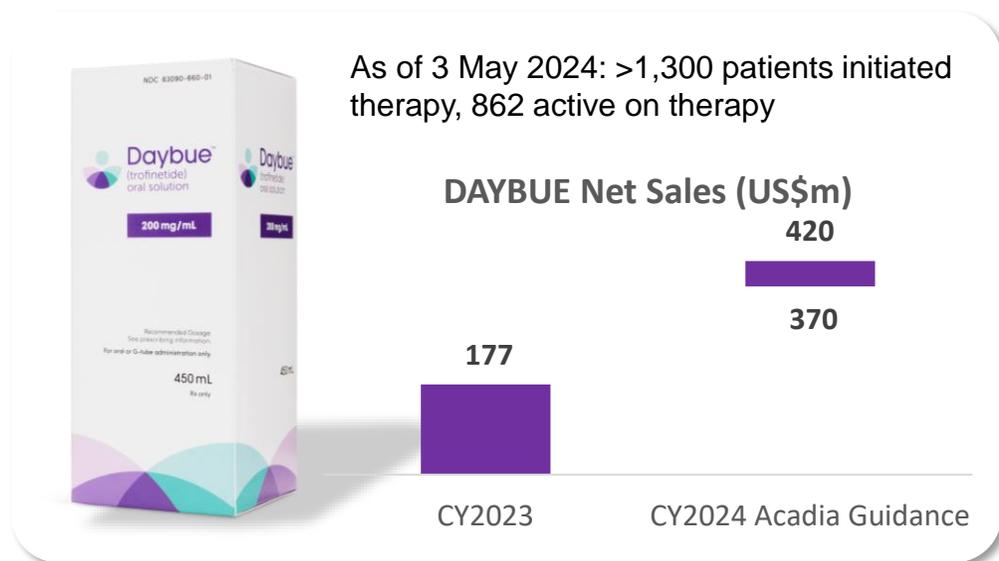
**DAYBUE /  
Trofinetide**

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# North America – DAYBUE™ US launch in April 2023

	US	Canada
Potential Rett patients	6,000 - 9,000 <sup>1</sup>	600 - 900 <sup>1</sup>
Currently identified Rett patients	5,000 <sup>1</sup>	NDS accepted for priority review, potential approval around year-end 2024 <sup>3</sup>



<sup>1</sup> Acadia estimates

<sup>2</sup> Royalty rates payable on the portion of annual net sales that fall within the applicable range

<sup>3</sup> Acadia First Quarter 2024 Earnings Call presentation in May 2024

## Economics to Neuren:

- ✓ **US\$10m** upfront in 2018
- ✓ **US\$10m** in 2022 following acceptance of NDA for review
- ✓ **US\$40m** in Q2 2023 following 1st commercial sale in the US
- US\$33m** one third share of Priority Review Voucher awarded to Acadia (assuming market value US\$100m)
- US\$55m** Milestone payments related to Fragile X

## Tiered Royalty Rates (% of net sales)<sup>2</sup>

Annual Net Sales	Rates	Sales Milestones Net Sales in one calendar year	US\$m
≤US\$250m	<b>10%</b>	≥US\$250m	<b>50</b>
>US\$250m, ≤US\$500m	<b>12%</b>	≥US\$500m	<b>50</b>
>US\$500m, ≤US\$750m	<b>14%</b>	≥US\$750m	<b>100</b>
>US\$750m	<b>15%</b>	≥US\$1bn	<b>150</b>

# Meaningful real world benefits reported

## LILAC-2 Caregiver Exit Interviews<sup>1</sup>

Area/type of improvement with trofinetide reported by ≥15% of caregivers, n (%)	Caregivers N=25 (%)
Engagement with others	11 (42.3)
Hand use	10 (38.5)
Eye gaze	8 (30.8)
Attention/focus/concentration	7 (26.9)
Tobii eye trackers use	7 (26.9)
Ability to make sounds	6 (23.1)
Happier mood or disposition	6 (23.1)
Ability to walk	5 (19.2)
Alertness	5 (19.2)
New words	5 (19.2)
Seizures	4 (15.4)
Aware of environment	4 (15.4)
Repetitive hand movements	4 (15.4)

## Real World Experience<sup>1</sup>

*“It was her engagement level with the world outside of her – to me and to friends in school; it just blossomed, and it was like a light was turned on.”*

*“Her verbalization definitely improved, and she started saying more things.”*

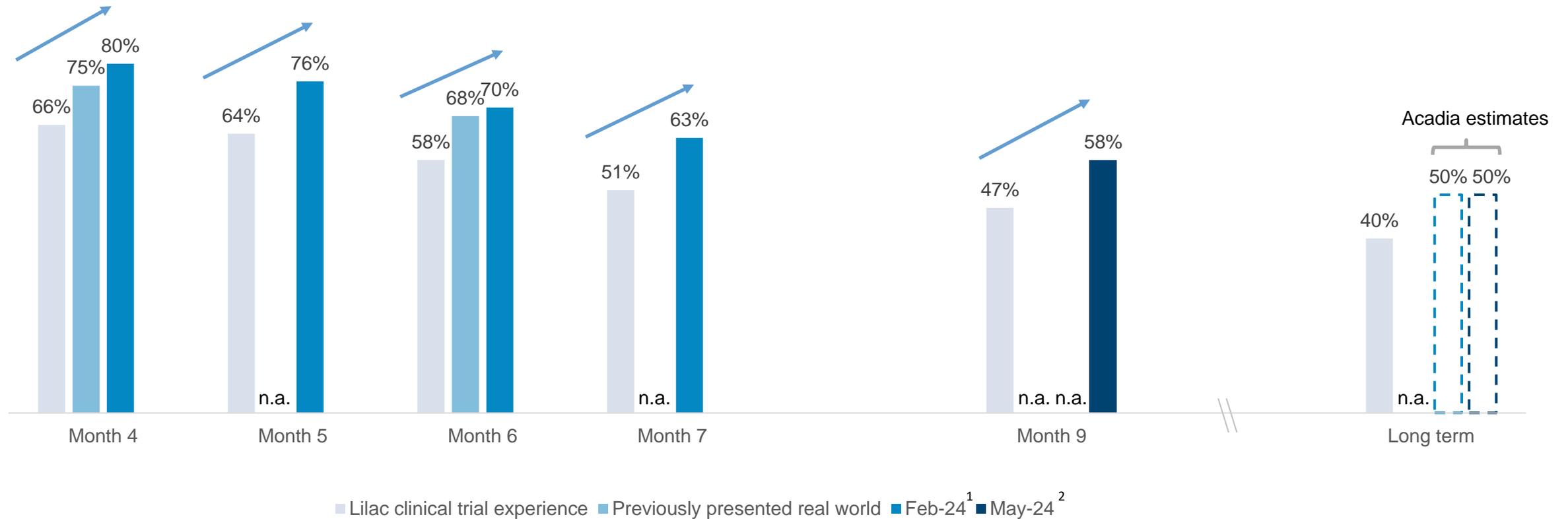
*“Picking up things a lot more (mostly her cup), happens daily and she is now trying to drink by herself.”*

*“Improved cognitive ability, and [the parents] are hearing new words or words they have not heard in a while.”*

<sup>1</sup> Acadia Fourth Quarter and Full Year 2023 Earnings Call presentation in Feb 2024

# Persistency rates improving in new patient cohorts

Persistency Rates  
(Based on confirmed discontinuations and patients who were 60 days past their scheduled refill)



<sup>1</sup> Acadia Fourth Quarter and Full Year 2023 Earnings Call presentation in Feb 2024

<sup>2</sup> Acadia First Quarter 2024 Earnings Call presentation in May 2024

# Outside North America

	Europe	Japan	Other
Potential Rett patients	9,000 - 14,000 <sup>1</sup>	1,000 - 2,000 <sup>1</sup>	~30,000 <sup>2</sup>
Currently identified Rett patients	~4,000 <sup>2</sup>	~800 - 1,000 <sup>2</sup>	~2,000 <sup>2</sup>

- **Europe:** Pediatric investigation plan (PIP) filed with and accepted by EMA, with a potential Marketing Authorisation Application filing in Q1 2025<sup>3</sup>
- **Japan:** Formal meeting with Japanese regulatory agency (PMDA) scheduled in 2Q24 to discuss clinical plan<sup>3</sup>

<sup>1</sup> Acadia estimates

<sup>2</sup> Neuren estimates based on prevalence studies and patient organisations

<sup>3</sup> Acadia First Quarter 2024 Earnings Call presentation in May 2024

## Economics to Neuren:

- ✓ **US\$100m** upfront
- US\$35m** following 1st commercial sale in Europe
- US\$15m** following 1st commercial sale in Japan
- US\$10m** following 1st commercial sale of a 2<sup>nd</sup> indication Europe
- US\$4m** following 1st commercial sale of a 2<sup>nd</sup> indication Japan

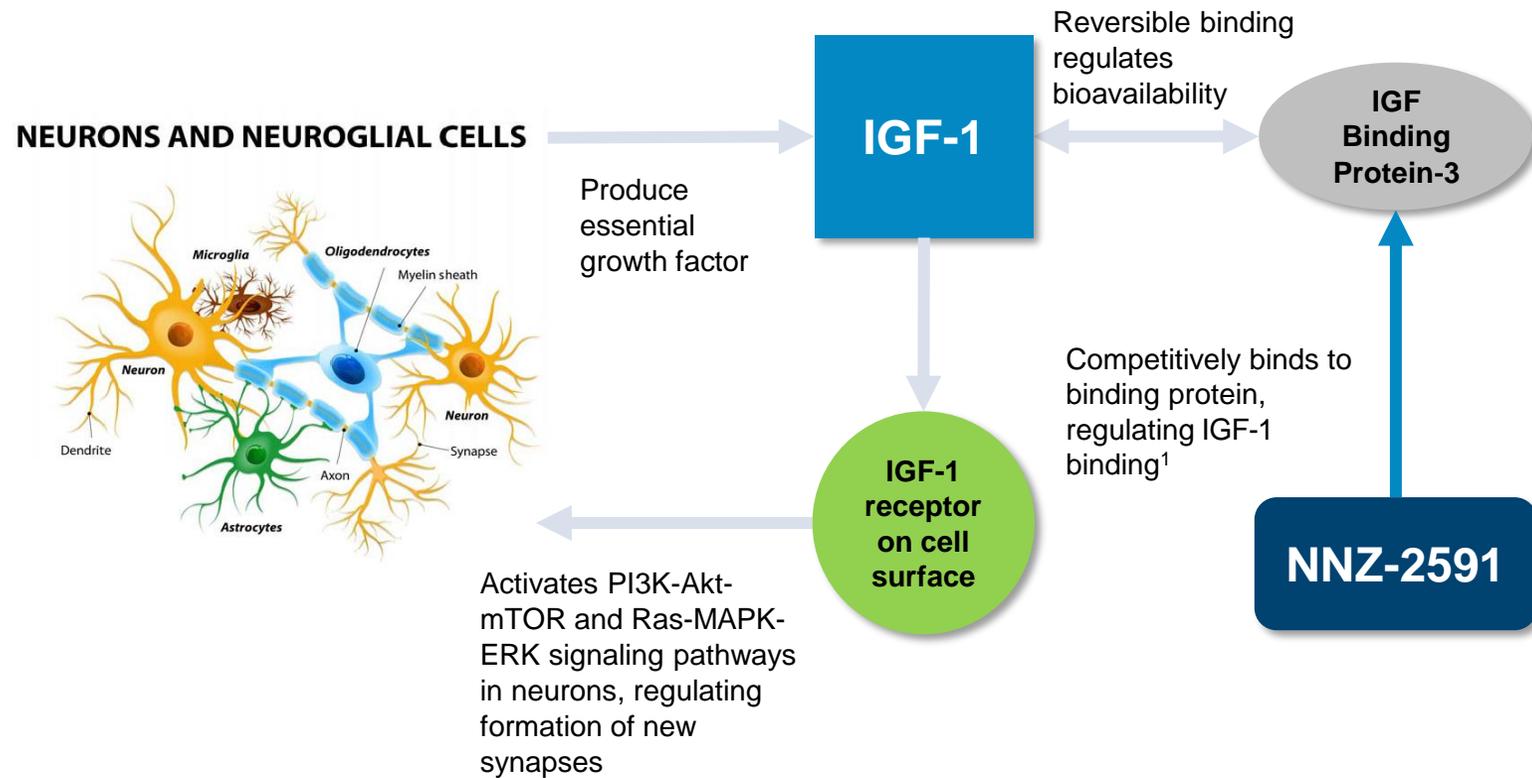
**Sales milestones** On achievement of escalating annual net sales thresholds:  
 Europe: up to **US\$170m**  
 Japan: up to **US\$110m**  
 RoW: up to **US\$83m**

**Tiered royalties** **Mid-teens to low-20s %** of net sales

**NNZ-2591**



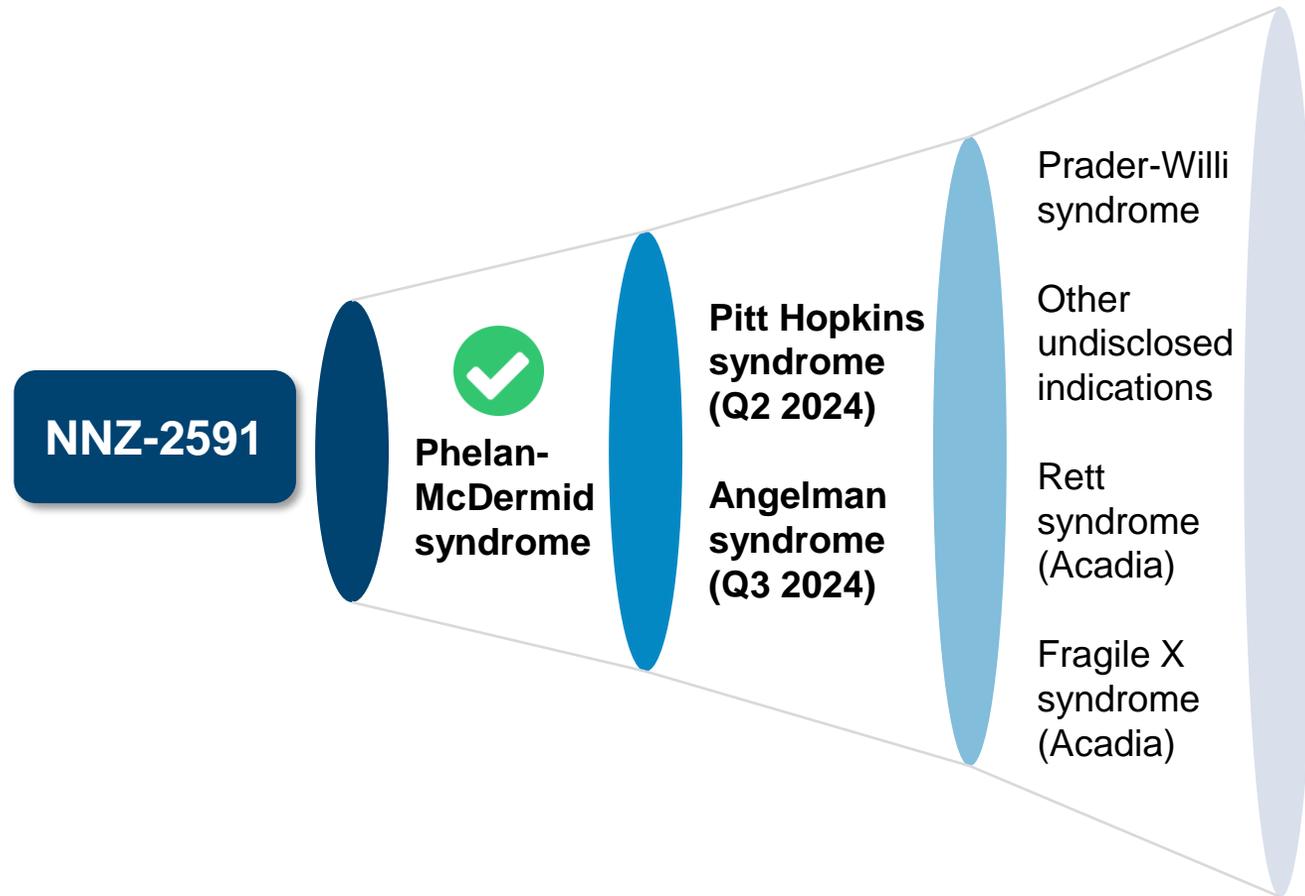
# Regulating IGF-1 in the brain



- **NNZ-2591** is a synthetic analog of cyclic glycine proline, a peptide that occurs naturally in the brain, designed to be more stable, orally bioavailable and readily cross the blood-brain barrier
- **NNZ-2591** can regulate the amount of IGF-1 that is available to activate IGF-1 receptors
- The effects of **NNZ-2591** are “state-dependent” – correcting impairment, but not impacting normal cells

<sup>1</sup> doi: 10.1038/srep04388: Guan et al, 2017: Cyclic glycine-proline (cGP) regulates IGF-1 homeostasis by altering the binding of IGFBP-3 to IGF-1

# Multiple indications opportunity for NNZ-2591

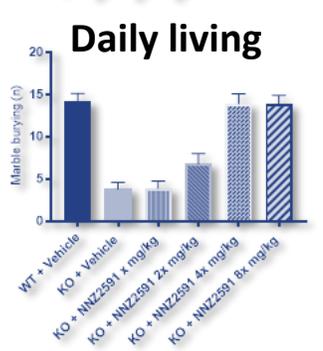
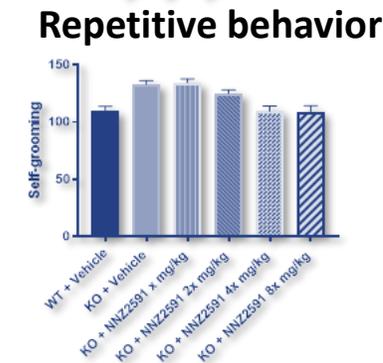
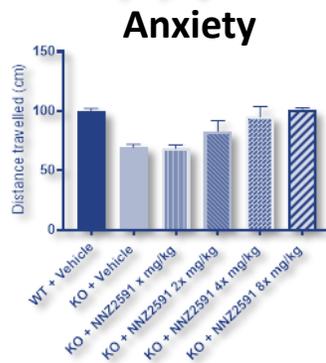
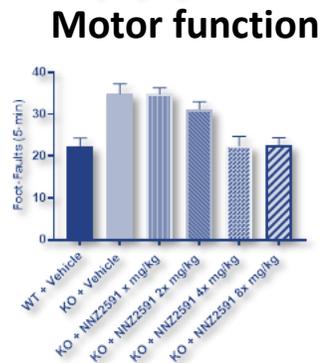
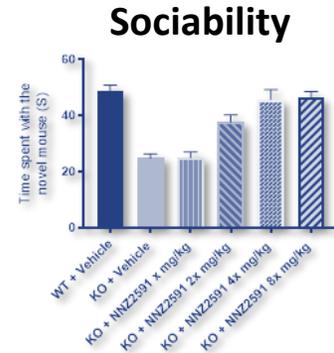
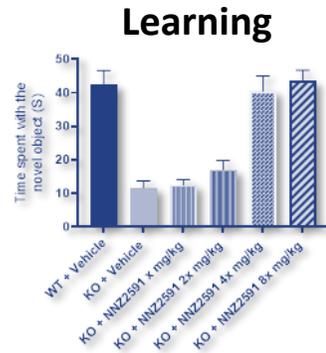
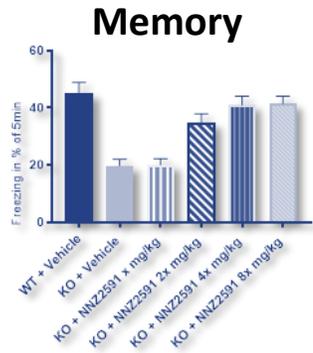


- **Positive results from Phelan McDermid syndrome Phase 2 trial; end of Phase 2 meeting with FDA planned Q3 2024**
- **Top-line results from Pitt Hopkins and Angelman syndrome Phase 2 trials expected in Q2 and Q3 2024**
- The mechanism of action of NNZ-2591 is relevant for many other neurodevelopmental synaptopathies
- Rett and Fragile X syndromes are licensed to Acadia, with same economics to Neuren as trofinetide; Neuren retains worldwide rights to all other indications

# NNZ-2591 has ideal attributes leading into Phase 2

- ✓ Novel mechanism of action
- ✓ Clear and consistent efficacy in mouse models of each syndrome
- ✓ Biochemical effects in the brain confirmed
- ✓ Optimum dose identified
- ✓ Demonstrated high oral bioavailability and blood-brain barrier penetration
- ✓ IND-enabling program of non-clinical toxicology and CMC studies completed
- ✓ Proprietary drug substance manufacturing process with exceptional purity and high yield, administered as patient-friendly liquid dose
- ✓ Safe and well tolerated in Phase 1 trial
- ✓ Orphan designations from FDA and EMA
- ✓ INDs approved by FDA for Phelan-McDermid, Pitt Hopkins, Angelman and Prader-Willi syndromes

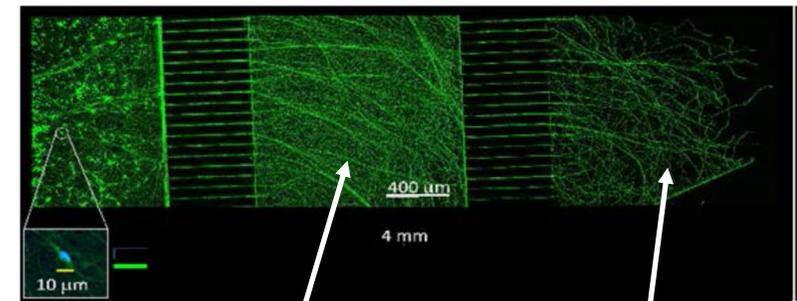
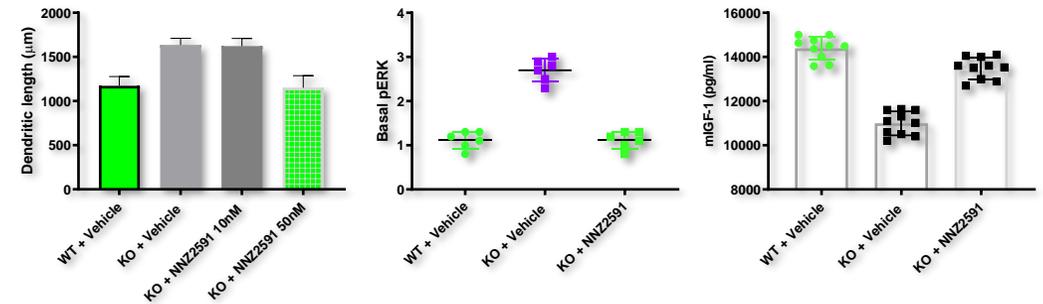
# Clear efficacy and dose response in Phelan-McDermid syndrome model



## Incidence of audiogenic seizures

WT + vehicle	0%
KO + vehicle	60%
KO + x mg/kg	50%
KO + 2x mg/kg	30%
KO + 4x mg/kg	10%
KO + 8x mg/kg	10%

In biochemical testing, NNZ-2591 was shown to normalize the abnormal length of dendritic spines that form the synapse, the excess activated ERK protein (pERK) and the depressed level of IGF-1 in *shank3* knockout mice

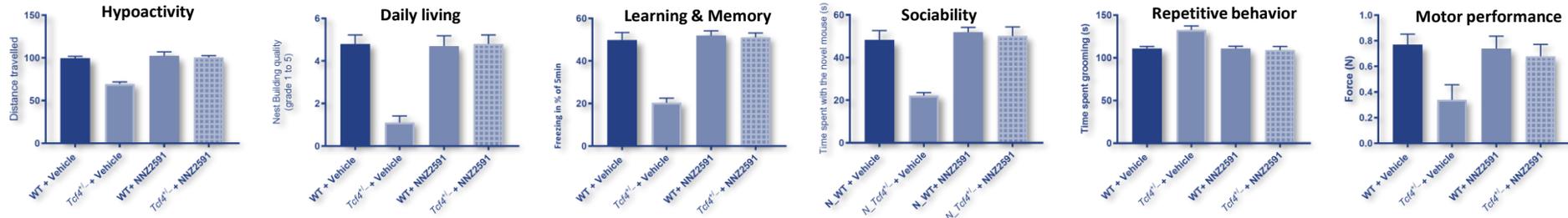


Abnormal dendrites in *shank3* knockout mice

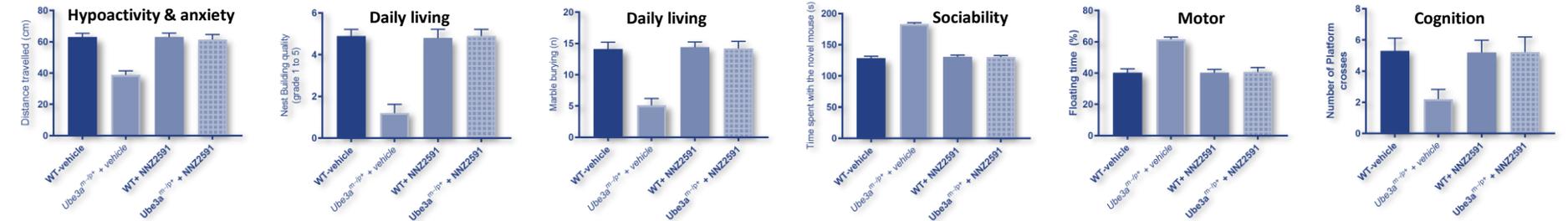
Normalization after treatment with NNZ-2591 cells in culture

# Consistent efficacy in Pitt Hopkins, Angelman and Prader-Willi models

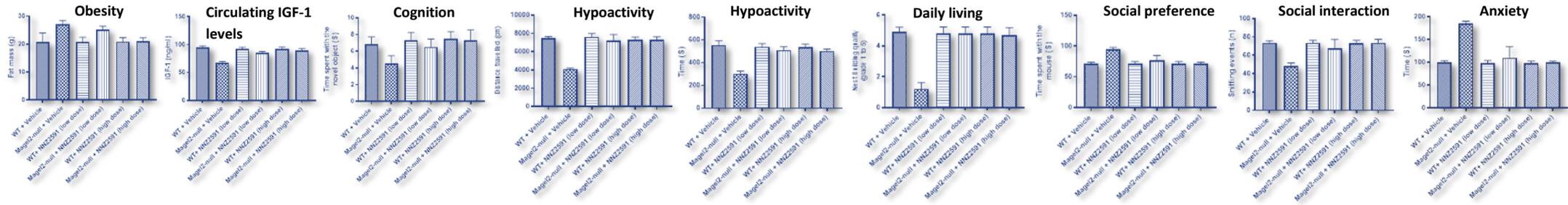
## Pitt Hopkins



## Angelman

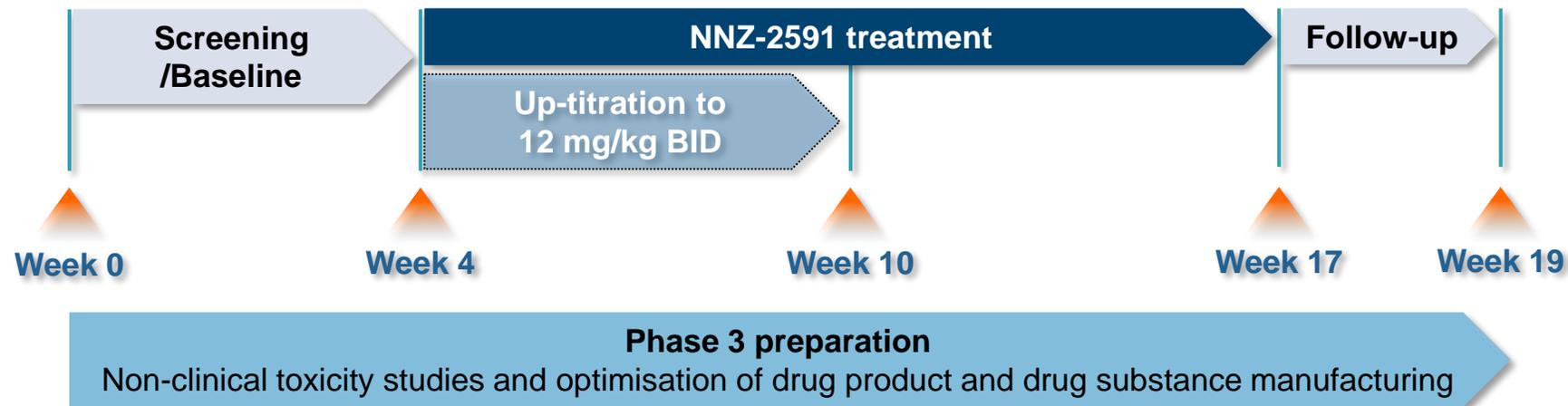


## Prader-Willi



# Key features of first Phase 2 trials

Overall aim - expedite data that informs the design of subsequent registration trials and prepare for Phase 3 in parallel



- Prioritising speed to data and maximising opportunity to demonstrate effects
- Confirm safety and PK in pediatric patients
- Assess treatment impact across multiple efficacy measures to select primary endpoint for registration trial
- **Positive results for Phelan-McDermid syndrome**
- **Top-line results for Pitt Hopkins syndrome in Q2 2024 and Angelman syndrome in Q3 2024**
- Manufacturing for Phase 3 commenced

# Phelan- McDermid syndrome (PMS)



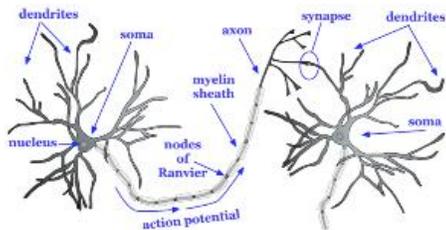
# PMS has overwhelming unmet medical need

## Cause of the syndrome

Deletion or variation in the *SHANK3* gene on chromosome 22



*SHANK3* protein plays a role in the formation, maintenance and function of dendrites and synapses



## Broad and severe impact on life

Intellectual impairment  
Behavioural issues  
Sleep disorders  
Seizures (~40% of patients)

Language deficits  
Feeding difficulties

Motor delays  
Low muscle tone

Sweat less, risk of overheating  
High pain tolerance

Difficulties toilet training (~3/4 of patients)  
GI dysfunction (most commonly constipation)

Walking abnormalities

Frequent hospitalization and heightened risk of accidents

## From Voice of the Patient Report

### Externally-Led Patient-Focused Drug Development Meeting 8 Nov 2022

**“PMS has an overwhelming unmet medical need.** *There are no FDA approved treatments for PMS despite its severely debilitating manifestations. Parents and caregivers are open to trying almost anything to try to relieve their child’s suffering; most have tried an incredibly high number of treatments and approaches for symptom management, with very little success. Some received medications that caused more harm than good”*

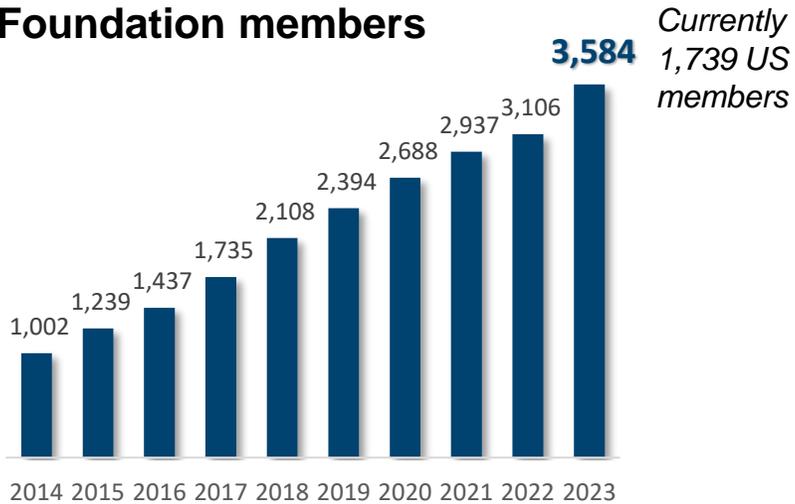
**“PMS has severe quality of life impacts on those living with the disease, as well as on parents and siblings.** *Most activities of daily life, including communicating needs or wants, self-care (bathing, dressing, toileting) and socializing with peers/siblings are affected. Most individuals living with PMS rely on their parents and caregivers for all their daily needs, and many require 24-hour care.”*

# PMS is historically under-diagnosed, but this is changing

Estimated prevalence is 1% of people with autism - 1/8,000 to 1/15,000 males and females<sup>1</sup>

	US	Europe	Japan	China	Other <sup>2</sup>
Potential PMS patients	17,000 – 32,000 <sup>3</sup>	21,000 – 41,000 <sup>3</sup>	5,000 - 9,000 <sup>3</sup>	51,000 – 95,000 <sup>3</sup>	16,000 - 31,000 <sup>3</sup>

## Phelan-McDermid Syndrome Foundation members



**75%** of PMS patients have been diagnosed with an ASD

**~1%** of autism patients have *SHANK3* mutations

## Opportunity to accelerate diagnosis



- Rising awareness
- EL-PFDD meeting with FDA in 2022
- ICD code assigned in 2023
- Enhanced genetic testing technologies
- Expanding ADDM network sites

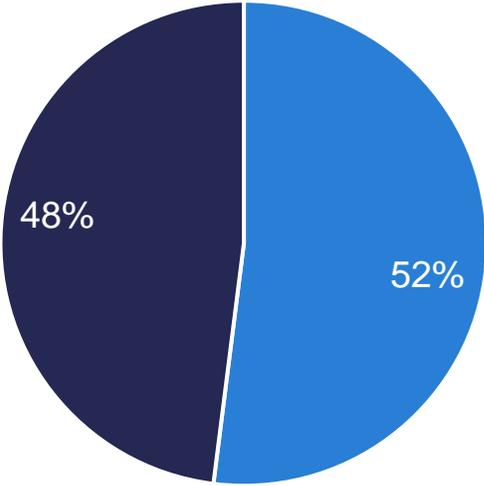
<sup>1</sup> Phelan McDermid Syndrome Foundation (PMSF) ([www.pmsf.org](http://www.pmsf.org))

<sup>2</sup> Brazil, Israel, South Korea, Australia and New Zealand

<sup>3</sup> Estimates based on United Nations population data 2022, derived by applying the estimated prevalence range to the populations under 60 years (urban population only for China)

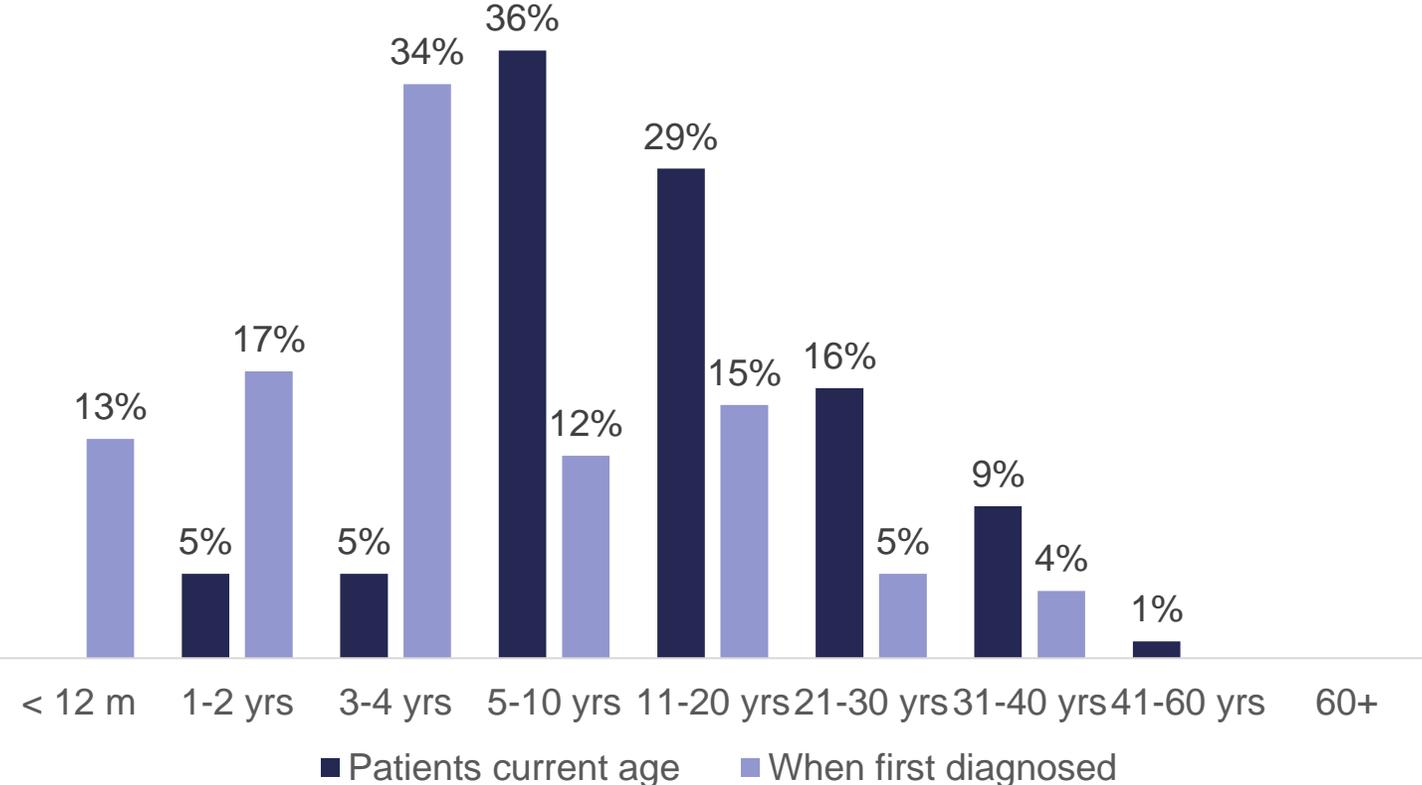
# PMS affects all genders and ages

% currently diagnosed patients by gender<sup>1</sup>



■ Male ■ Female

% currently diagnosed patients by age group<sup>1</sup>



<sup>1</sup> Estimates based on survey of participants in the Externally-Led Patient Focused Drug Development (EL-PFDD) meeting on Phelan-McDermid Syndrome 8 Nov 2022

# Neuren is leading development of a first approved treatment for PMS

## Phase 2 Program Status

- Phase 2 clinical development in the US under an IND
- End of Phase 2 Meeting with FDA planned Q3 2024
- Orphan Drug designation in US and EU
- Eligible for Rare Pediatric Disease Designation Priority Review Voucher program

## Limited products in development

Company	Product Development Stage
	<b>Positive Phase 2 trial</b>
#2	Phase 2 trial closed Jan 2021
#3	Phase 1
#4	Phase 1
#5	Pre-clinical

## Neuren engaging with all stakeholders



Leading clinicians



# Neuren's Phase 2 trial in children with PMS

First study in pediatric patients, collecting the data needed to design a registration study

4 US sites: Rush University, Massachusetts General Hospital, Boston Children's Hospital and Texas Children's Hospital

n subjects: 18  
Age range: 3 to 12 (mean 8.6)



## Endpoints

- Primary endpoints are safety, tolerability and PK
- Secondary endpoints include 14 efficacy measurements
- A key objective is selection of the best primary efficacy endpoint or endpoints for a registration study

### Global

- CGI-I
- Caregiver Impression of Change (CIC)
- CGI-S

### GI Health

- GIHQ

### Symptom Specific

- PMS Clinician Domain Specific Rating Scale
- Caregiver Top 3 Concerns

### Communication

- MB-CDI
- ORCA

### Quality of Life

- QI-Disability
- ICND

### Sleep

- CSHQ

### Behaviour

- Aberrant Behavior Checklist-2
- Behavior Problems Inventory
- Vineland Adaptive Behavior Scales

# Phase 2 clinical trial results highlights

- **NNZ-2591 was safe and well tolerated, with no clinically significant changes in laboratory values or other safety parameters during treatment**
- **Significant improvement was assessed by both clinicians and caregivers across multiple efficacy measures**
- **Improvements were consistently seen across clinically important aspects of Phelan-McDermid syndrome, including communication, behaviour, cognition/learning and socialisation**
- **Clinician and caregiver global efficacy measures showed a level of improvement typically considered clinically meaningful:**
  - **Clinical Global Impression of Improvement (CGI-I) – mean score of 2.4 with 16 out of 18 children showing improvement assessed by clinicians**
  - **Caregiver Overall Impression of Change (CIC) – mean score of 2.7 with 15 out of 18 children showing improvement assessed by caregivers**
- **For 10 out of 14 efficacy endpoints, improvement from baseline on overall/total scores was statistically significant ( $p < 0.05$ )<sup>1</sup>**

<sup>1</sup> Wilcoxon signed rank test

# Safety and tolerability summary

## NNZ-2591 was safe and well tolerated

- ✓ Well tolerated
- ✓ Most Treatment Emergent Adverse Events (TEAE) were mild to moderate
  - 1 Serious TEAE (gastroenteritis) not related to study drug, occurred during safety follow-up period after end of treatment
  - 3 discontinuations due to TEAEs not related to study drug: 2 due to testing positive for COVID-19 and 1 due to seizures
- ✓ No clinically significant changes in laboratory values, electrocardiogram (ECG) or other safety parameters were observed during treatment

### TEAEs in 2 or more subjects

Event	N=18 n (%)	Event	N=18 n (%)
Constipation	2 (11.1)	Somnolence	3 (16.7)
Diarrhea	2 (11.1)	Pyrexia	3 (16.7)
Nausea	2 (11.1)	Fatigue	2 (11.1)
Vomiting	2 (11.1)	Aggression	2 (11.1)
COVID-19	3 (16.7)	Insomnia	2 (11.1)
Nasopharyngitis	2 (11.1)	Decreased Appetite	3 (16.7)
Otitis Media	2 (11.1)	Rhinorrhea	2 (11.1)
Psychomotor Hyperactivity	4 (22.2)		

# Efficacy endpoints summary

## Efficacy measures and p-values<sup>1</sup> (Total/Overall scores)

### Global

<b>CGI-I</b>	<b>&lt;0.0001</b>
<b>CIC</b>	<b>0.0003</b>
<b>CGI-S</b>	<b>0.0156</b>

### GI Health

<b>GIHQ total frequency</b>	<b>0.0013</b>
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### Quality of Life

<b>QL Inventory-Disability total</b>	<b>0.0066</b>
Impact of Childhood Neurologic Disability	0.1094

### Sleep

<b>CSHQ total</b>	<b>0.0191</b>
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### Behaviour

<b>Aberrant Behavior Checklist-2 total</b>	<b>0.0013</b>
<b>Behavior Problems Inventory total frequency</b>	<b>0.0326</b>
Vineland Adaptive Behavior Scales Composite	0.1710

### Symptom Specific

<b>PMS Clinician Domain Specific Rating Scale total</b>	<b>0.0156</b>
<b>Caregiver Top 3 Concerns total</b>	<b>0.0005</b>

### Communication

MB-CDI Total Vocabulary	0.0647
ORCA T-Score	0.0714

- Statistically significant improvement vs baseline in **10/14** efficacy endpoints

- Mean **CGI-I** of **2.4** and Median of 2.0 with p-value <0.0001

- Mean **CIC** of **2.7** and Median of 3.0 with p-value =0.0003

<sup>1</sup> Wilcoxon signed rank test

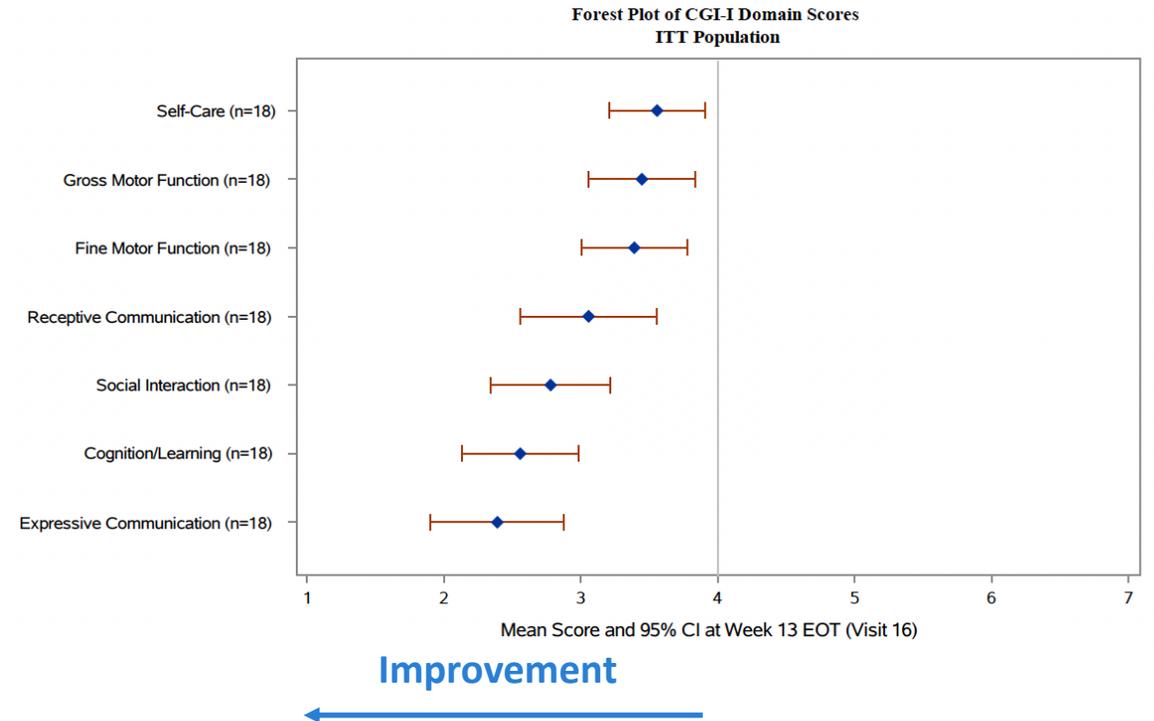
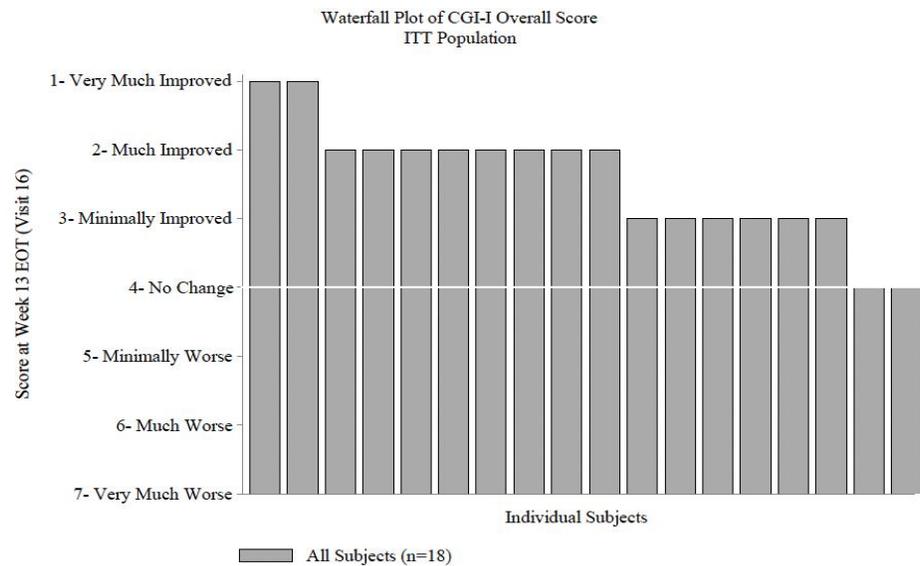
# Best practice implemented for PMS-specific CGI-I and CIC measures

- Both CGI-I and CIC scores reflect overall improvement from baseline
  - 1 – Very Much Improved
  - 2 – Much Improved
  - 3 – Minimally Improved
  - 4 – No Change
  - 5 – Minimally Worse
  - 6 – Much Worse
  - 7 – Very Much Worse
- All clinician raters complete training to calibrate scoring and interpretation of the scoring anchors amongst raters. Training was done at study start up and a follow-up calibration training was done during the study

	Clinical Global Impression of Improvement (CGI-I)	Caregiver Impression of Change (CIC)
<b>Scoring</b>	<b>Clinician</b> gives an overall score and domain scores	<b>Caregiver</b> gives an overall score and domain scores Also identifies the one symptom area that has most influenced his or her rating of the child’s overall function
<b>Domain Anchors</b>	<ul style="list-style-type: none"> <li>• Expressive Communication</li> <li>• Receptive Communication</li> <li>• Gross Motor Function</li> <li>• Fine Motor Function</li> <li>• Social Interaction</li> <li>• Cognition and Learning</li> <li>• Self-Care</li> </ul>	<ul style="list-style-type: none"> <li>• Communication</li> <li>• Social interaction</li> <li>• Behavior</li> <li>• Motor abilities</li> <li>• Seizures</li> <li>• Cognitive abilities/ability to learn</li> <li>• Self-care skills</li> <li>• GI problems</li> <li>• Sensory sensitivities</li> </ul>

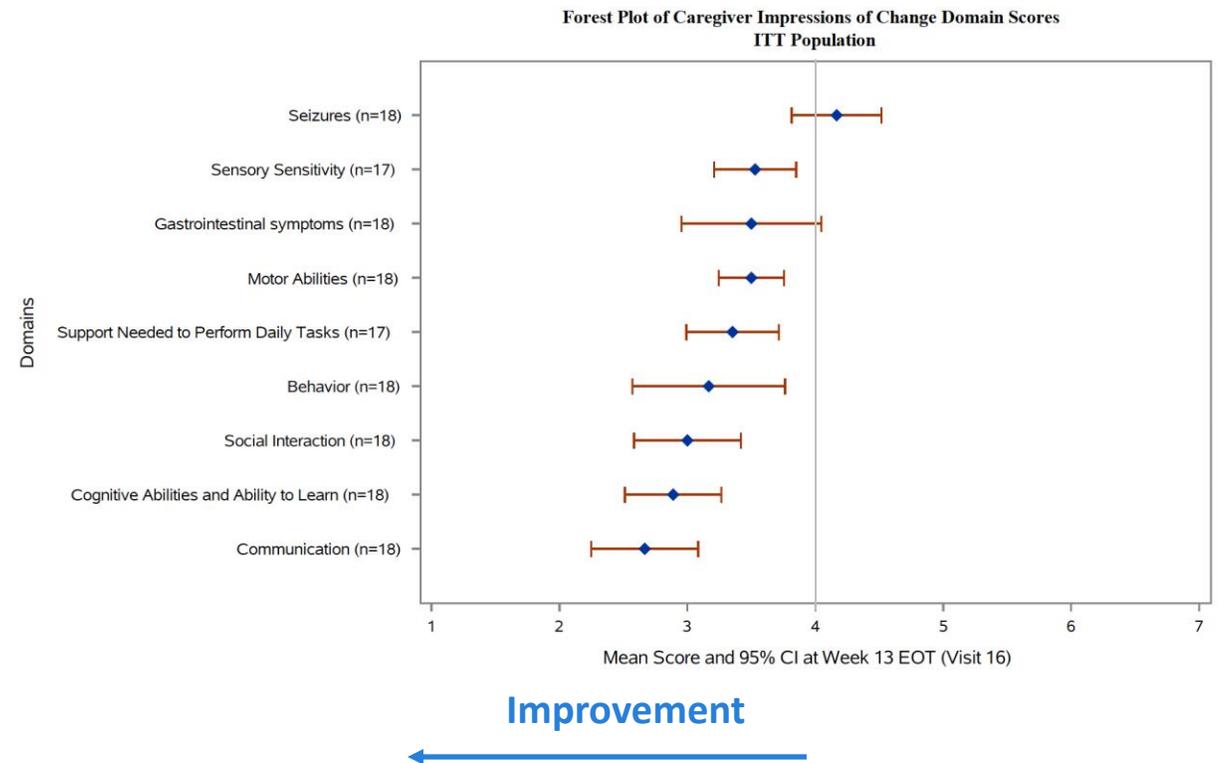
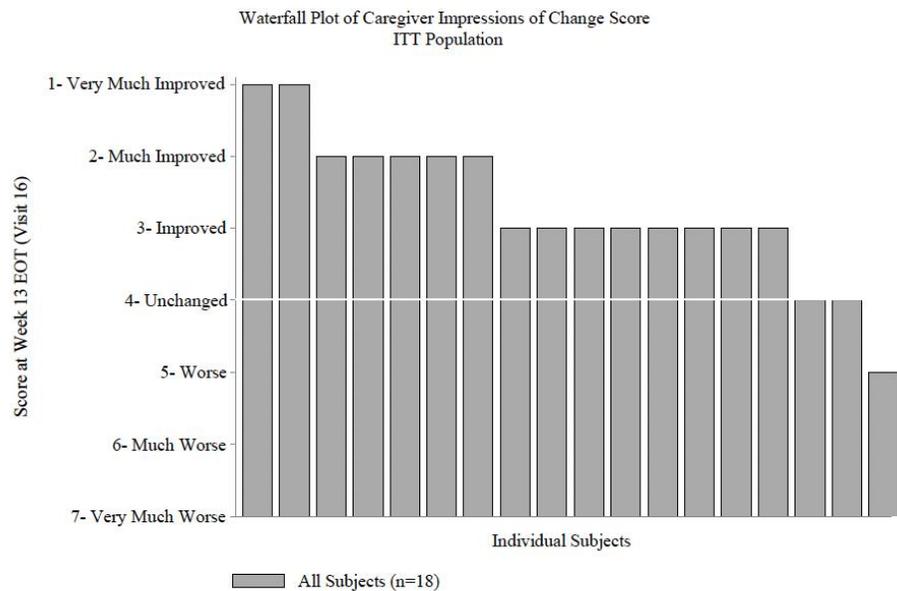
# CGI-I (clinician) results by subject and by domain

Mean CGI-I score of 2.4 with 16 out of 18 children showing improvement



# CIC (caregiver) results by subject and by domain

Mean CIC score of 2.7 with 15 out of 18 children showing improvement

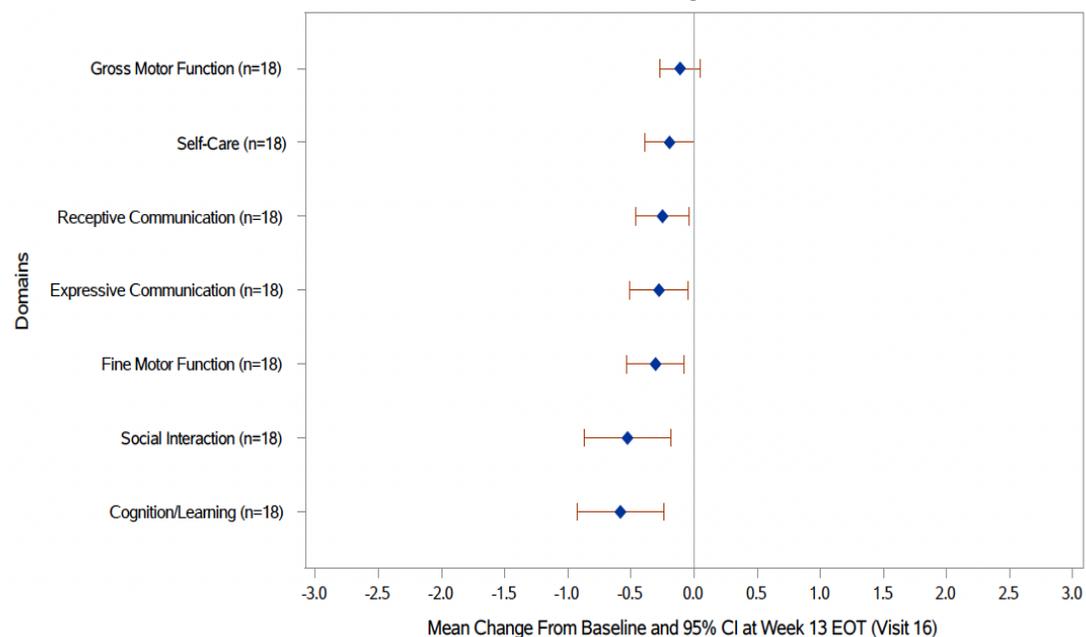


# Clinical Global Impression of Severity (CGI-S) and Caregiver Top 3 Concerns results by domain

7 subjects improved by one point on the overall CGI-S score after 13 weeks of treatment and improvement was observed in the most common concerns of caregivers (communication, behaviour, social interaction, self-care)

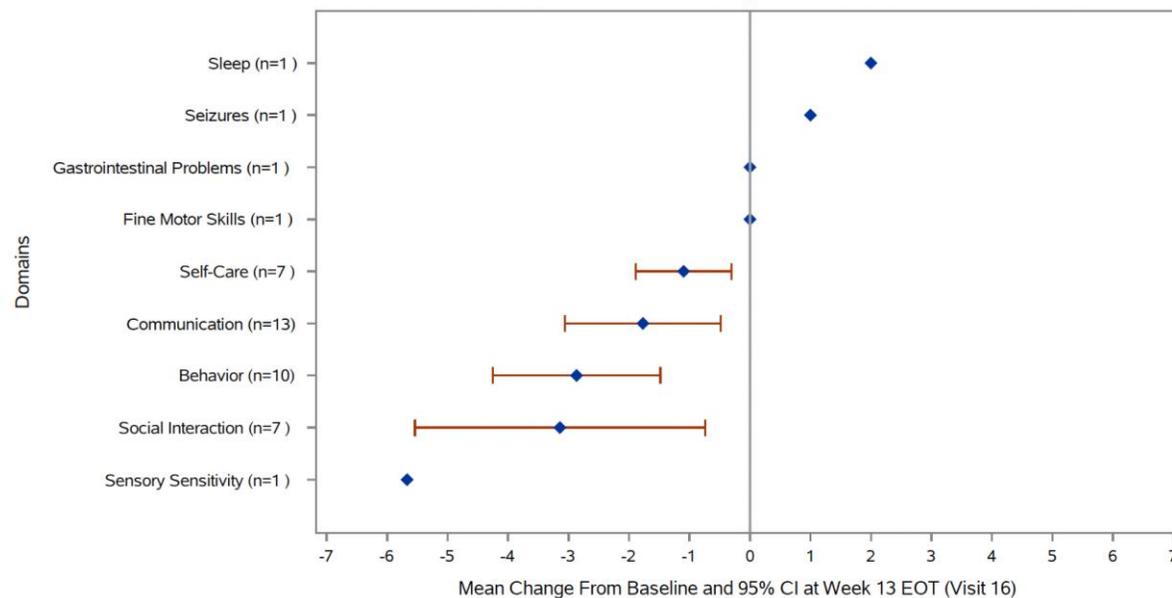
## CGI-S domains

Forest Plot of CGI-S Domain Scores (Change from Baseline)  
ITT Population



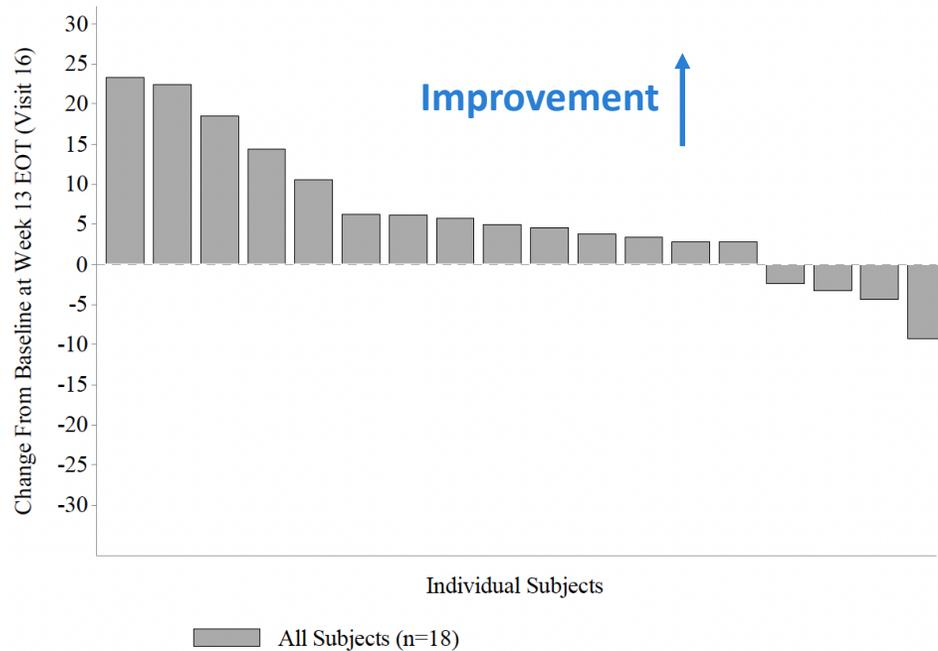
## Caregiver Top 3 Concerns (Domains based on frequency of nomination)

Forest Plot of Caregiver Top 3 Concerns Domain Scores (Change from Baseline)  
ITT Population

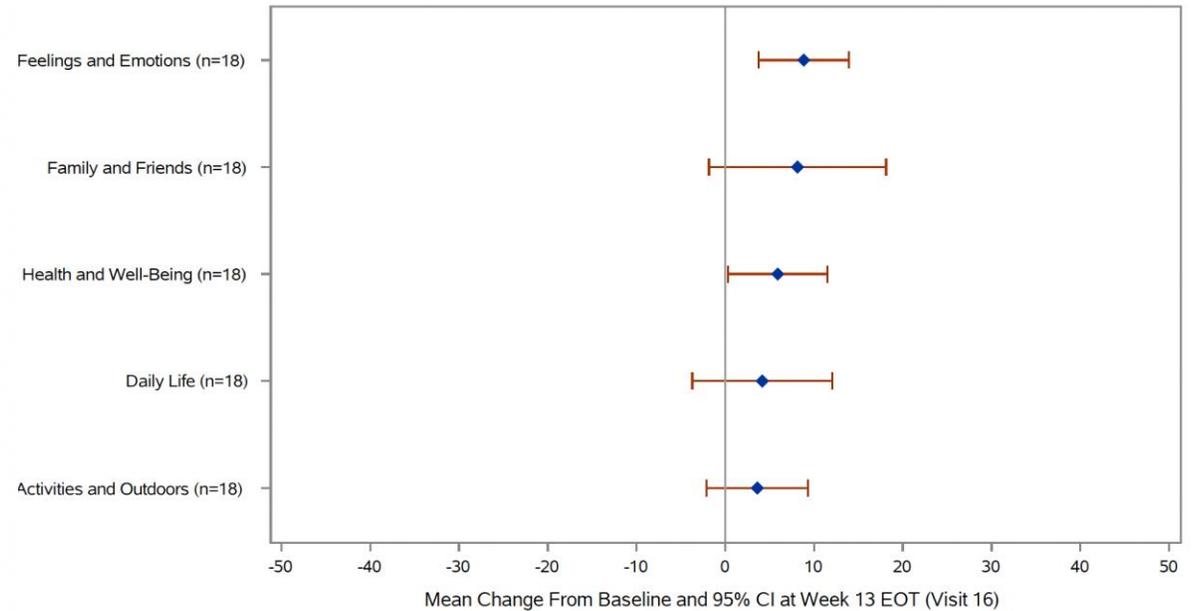


# Quality of Life Inventory-Disability results by subject and by subscale

Waterfall Plot of QL-Disability Overall Score (Change from Baseline)  
ITT Population

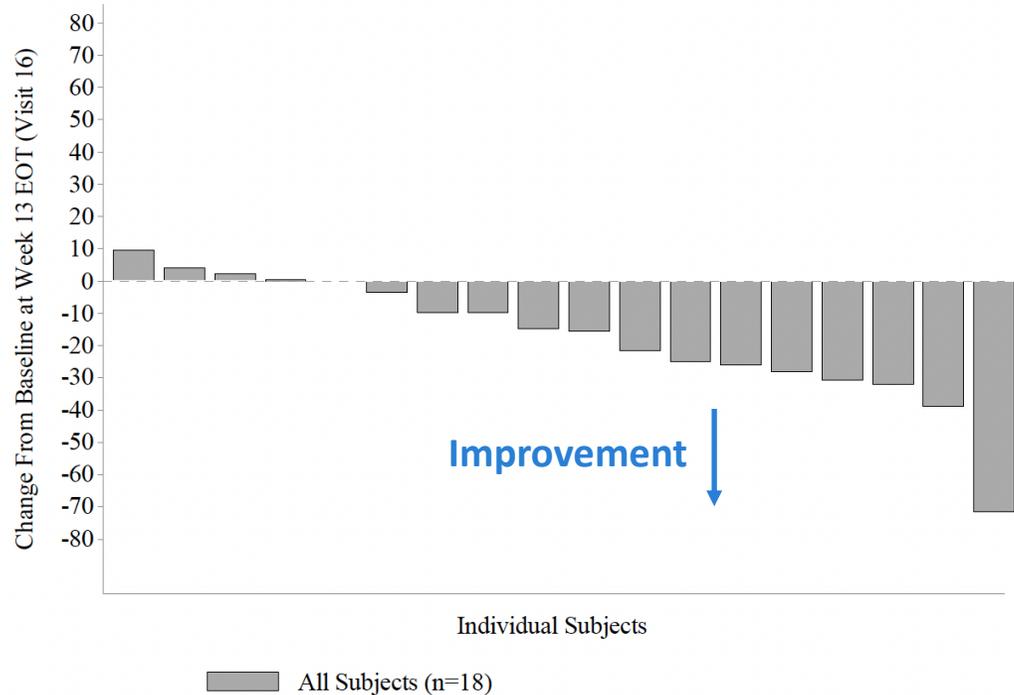


Forest Plot of Quality of Life Inventory - Disability (QL-Disability) Domain Scores (Change from Baseline)  
ITT Population



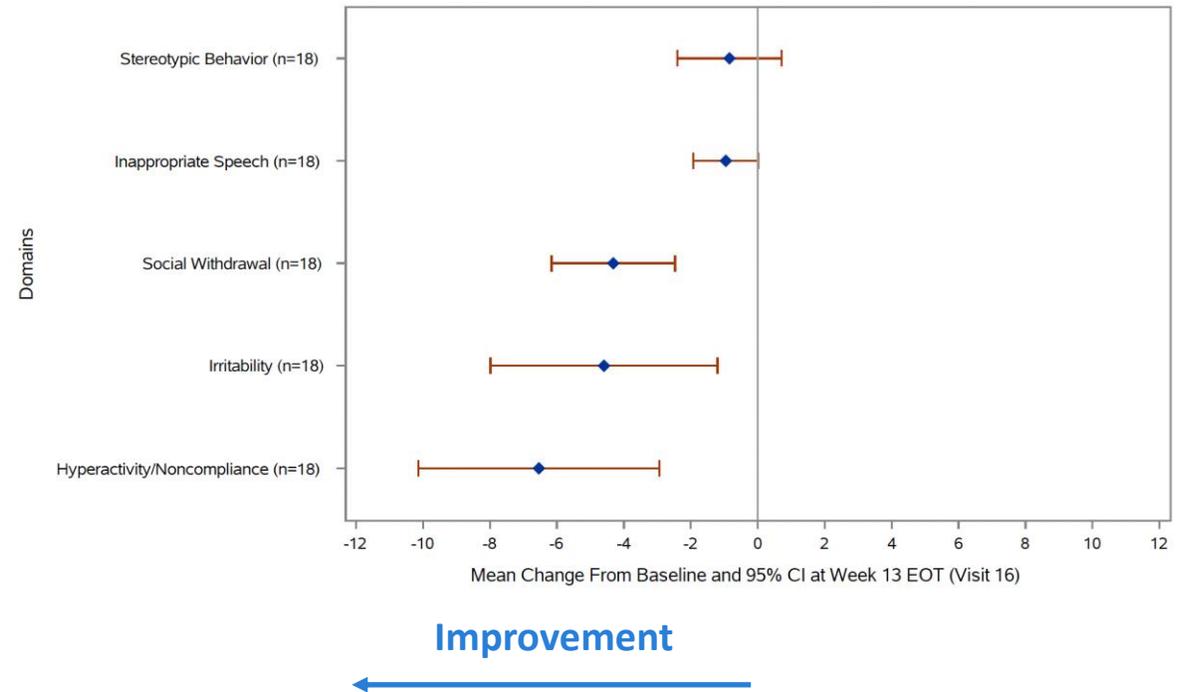
# Aberrant Behavior Checklist-2 results by subject and by subscale

Waterfall Plot of ABC-2 Total Score (Change from Baseline)  
ITT Population



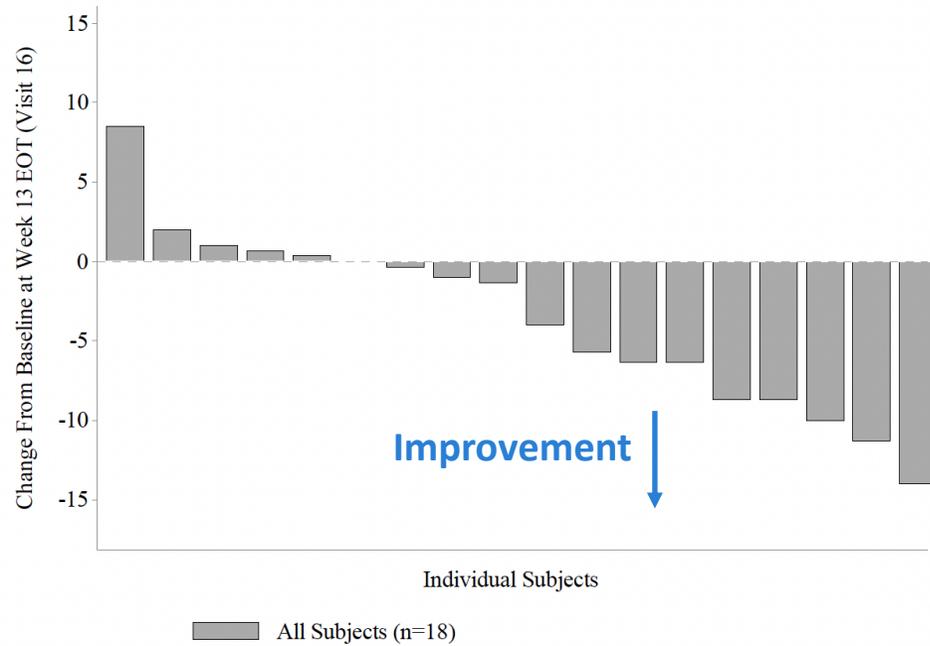
Subjects with a score of zero not shown

Forest Plot of ABC-2 Subscale Scores (Change from Baseline)  
ITT Population



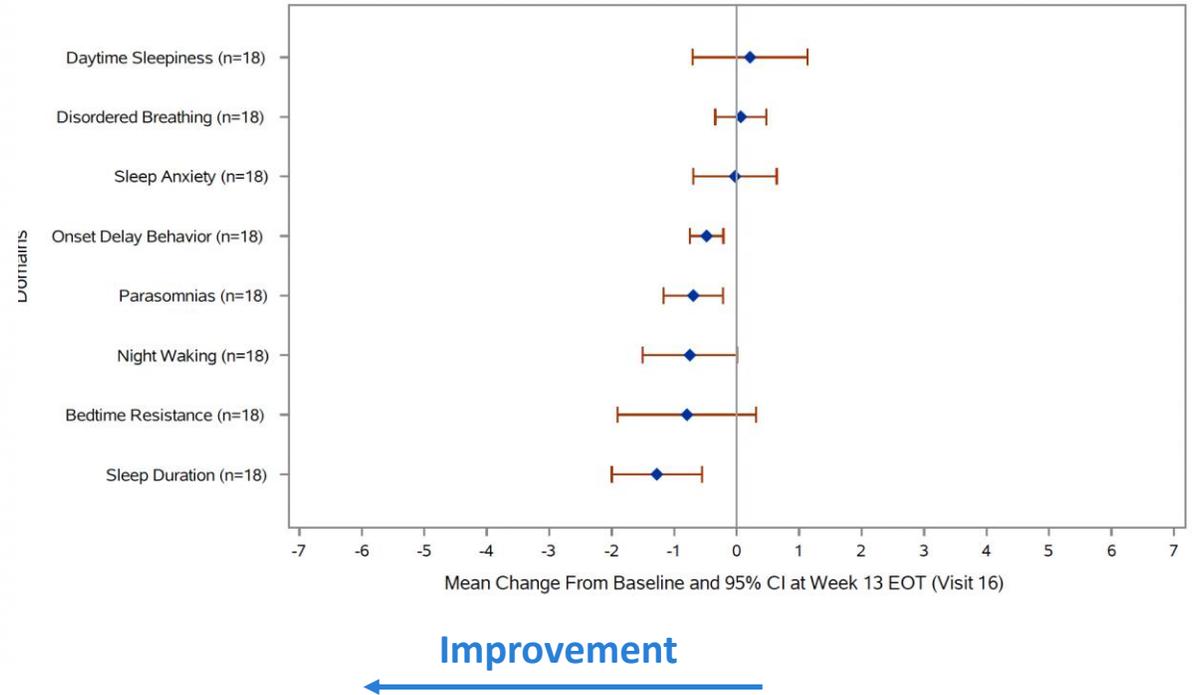
# Child Sleep Habits Questionnaire results by subject and by subscale

Waterfall Plot of CSHQ Total Score (Change from Baseline)  
ITT Population

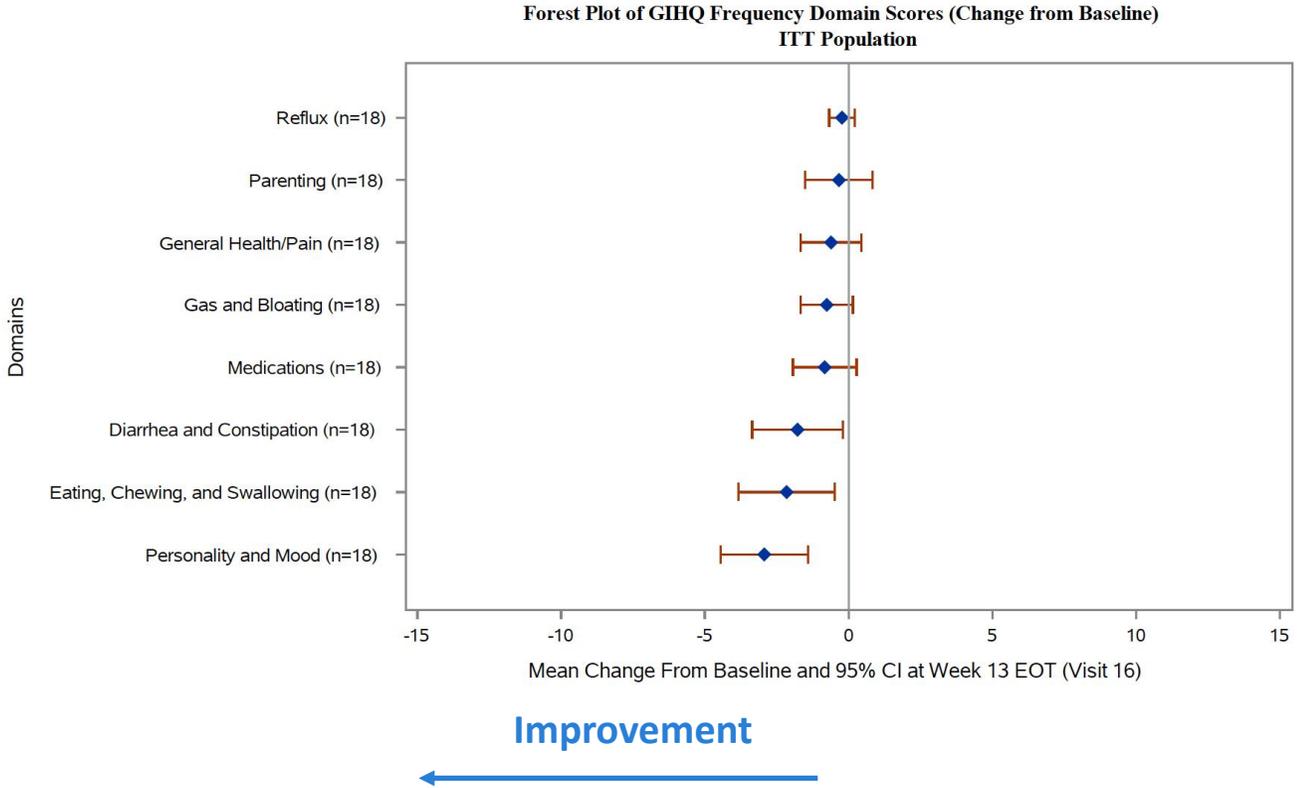
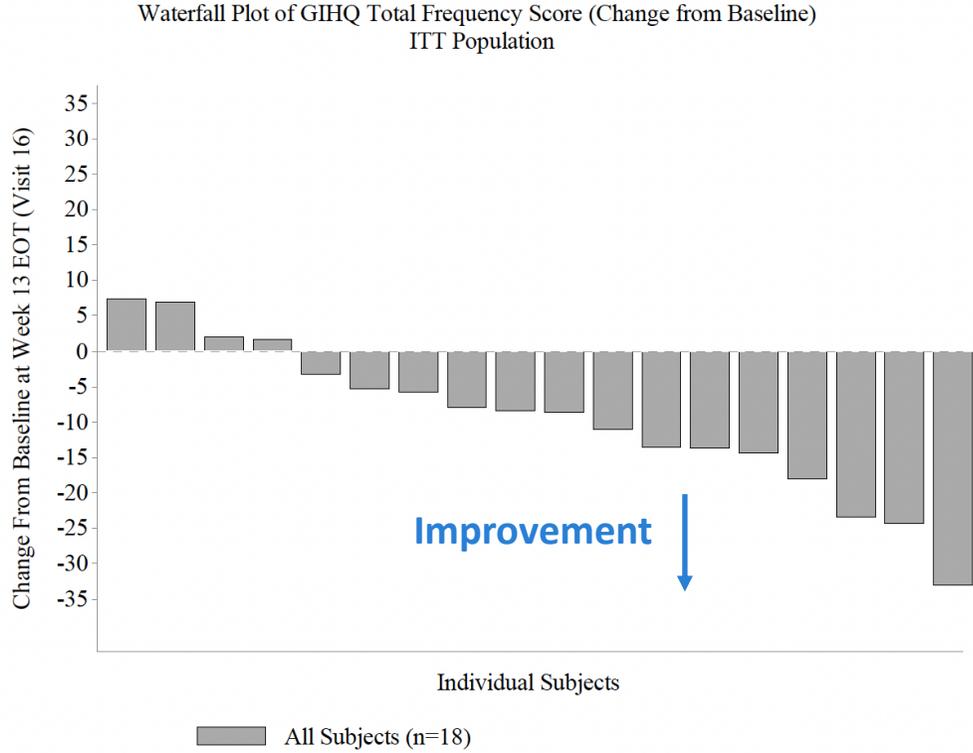


Subjects with a score of zero not shown

Forest Plot of Child Sleep Habits Questionnaire (CSHQ) Sleep Disturbance Domain Scores (Change from Baseline)  
ITT Population



# Gastrointestinal Health Questionnaire results by subject and by subscale



Acknowledgment: GIHQ developed by Kathleen J. Motil, MD, PhD, Baylor College of Medicine

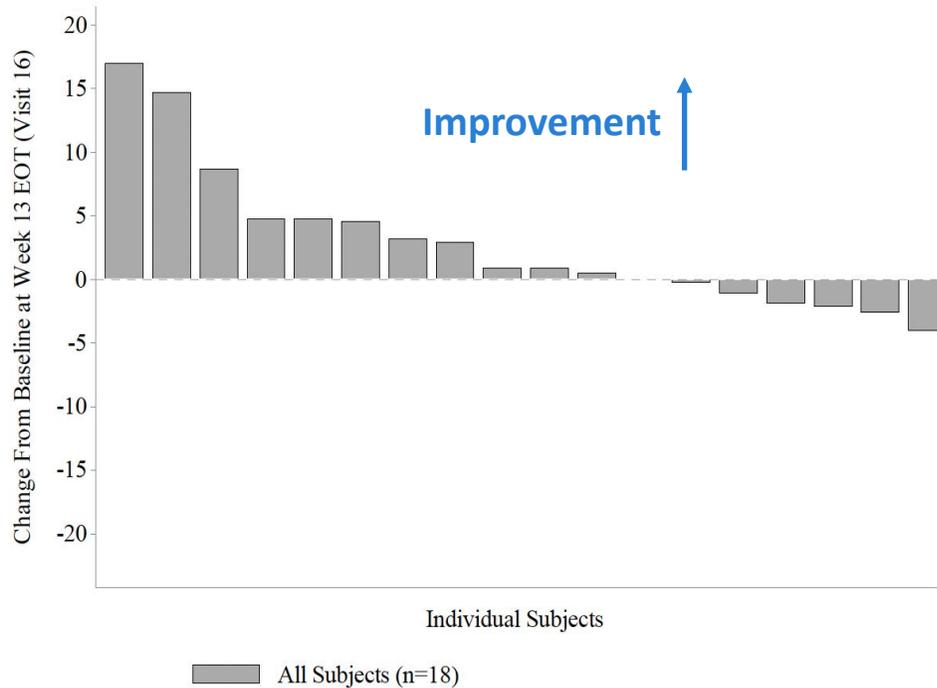


# ORCA T-Score and MB-CDI Total Vocabulary results by subject

Improvements in communication observed in ORCA T-Score and MB-CDI Total Vocabulary, as well as domains/subscales in CGI-I, CGI-S, CIC and Caregiver Top 3 Concerns

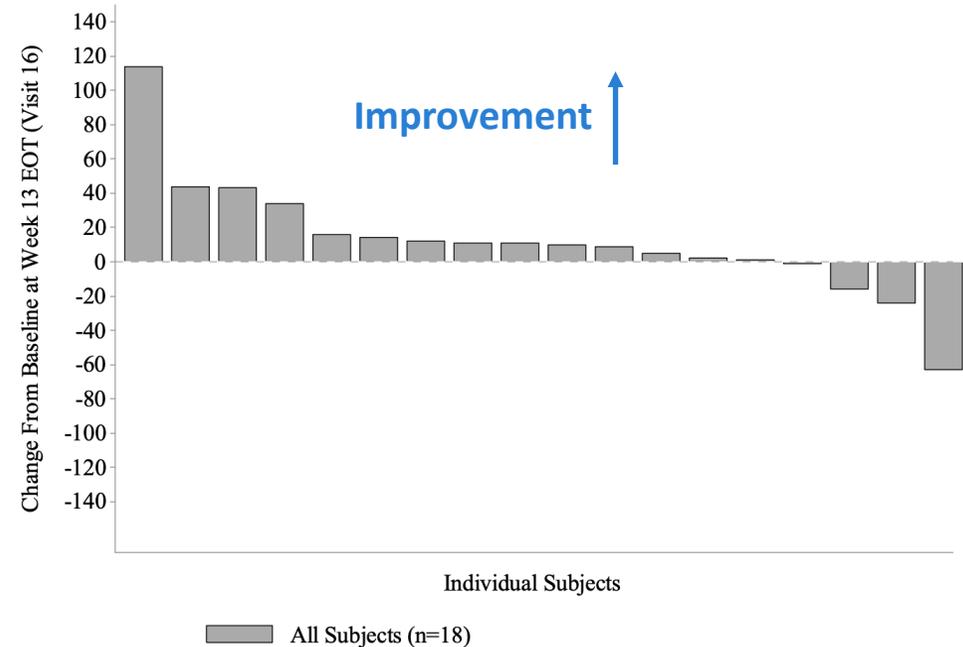
## ORCA T-Score

Waterfall Plot of ORCA T-Score (Change from Baseline)  
ITT Population



## MB-CDI Total Vocabulary

Waterfall Plot of MB-CDI Total Vocabulary Score (Change from Baseline)  
ITT Population



# Clinician and caregiver testimonials

## Clinicians

*"Marked improvement in expressive language and moderate improvement in socialization."*

*"Teachers noted improvement in learning new skills."*

*"Able to focus work at school, both to the things they always enjoy and new tasks."*

*"Expressive communication- significant improvement in using more complex phrases, better back and forth communication. Better expressing needs. Some commentary on how mom is feeling, "I want you to be happy"."*

*"Expressive communication- babbling much more than baseline."*

*"A few 1-2 word phrases that were not at baseline "oh boy", "Hi Mama", "I love you", "oh my"."*

*"Gross motor- Stronger climbing ladders, comes downstairs which never did before, Walks upstairs without help (needed help at baseline)."*

## Caregivers

*"Using more words while retaining eye contact... Improved pretend play... Initiating eye contact"*

*"Less scripting, less stimming... More flexible with changes... In general, they are more safe-even at bus stop"*

*"More focused , engaged, aware of their environment, people."*

*"So much happier, not throwing self to ground when can't get his way"*

*"More attentive and it makes for an easy learner, Now can focus better on what we are trying to teach."*

*"Attention span is great right now... He can focus long enough to complete tasks and try new things."*

*"Can now run instead of walking fast... Good balance, not needing assistance on stairs."*

# Pitt Hopkins syndrome (PTHS)



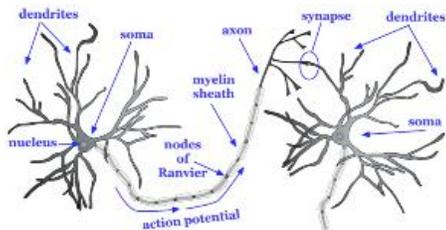
# PTHS overview

## Cause of the syndrome

Deletion or variation in the *TCF4* gene on chromosome 18



*TCF4* protein plays a role in the formation, maintenance and function of dendrites and synapses



## Broad and severe impact on life

- Intellectual impairment
- Behavioural issues
- Sensory processing disorder
- Sleep disorders
- Seizures
- Vision impairment (severe myopia)
- Language deficits
- Breathing problems (hyperventilation, apnea, breath-holding)
- Feeding difficulties
- Motor impairments including hypotonia (low muscle tone) and gross and fine motor delays
- GI dysfunction (gastroesophageal reflux and constipation)
- Walking abnormalities

## Patients stories

### Pitt Hopkins Research Foundation

“She was tested earlier for Angelman and Rett Syndrome, but they were of course negative. I had a strange feeling that something was wrong with her already when she was a newborn...I started to see different doctors with her, but they just told me nothing was wrong, until we met a Neurologist who told us that she had Cerebral Palsy and that she would not be able to walk, ever...She doesn't talk but when she was about one year old she was saying a few words that never ever came back...”

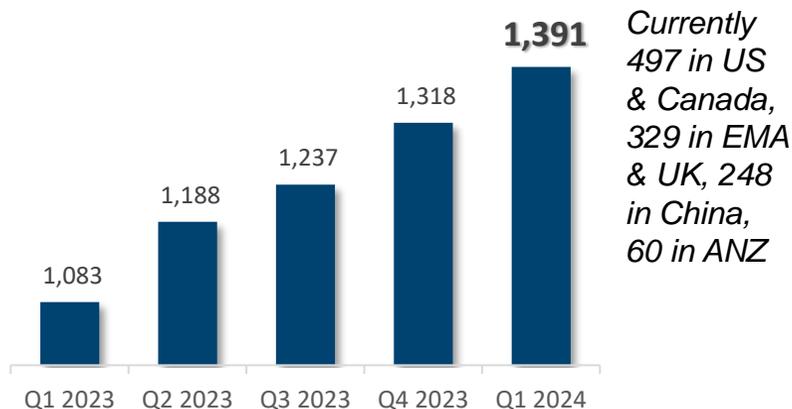
“Caleb is currently 10 months old and he does not sit or roll yet and is not really interested in toys. He is currently in an early intervention program and is going through physical therapy, and sees a vision teacher and special education teacher...It has not been an easy journey thus far. I still do not know how and where I get all my strength from. I know things will only get harder as he gets older but I am ready to accept the challenge and take each day as it comes.”

# PTHS is historically under-diagnosed, but this is changing

Estimated prevalence is 1/34,000 to 1/41,000 males and females<sup>1</sup>

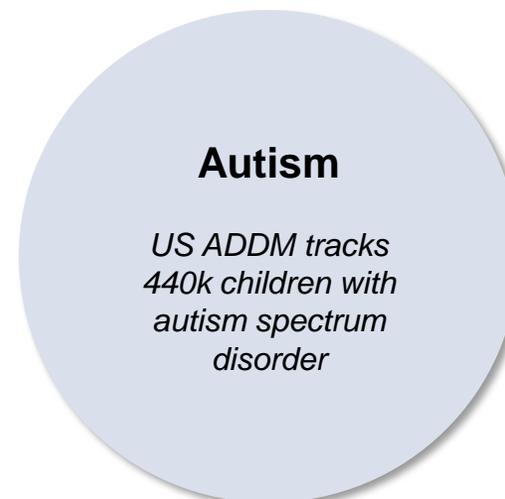
	US	Europe	Japan	China	Other <sup>2</sup>
Potential PTHS patients	6,000 – 7,000 <sup>3</sup>	8,000 – 9,000 <sup>3</sup>	1,000 - 2,000 <sup>3</sup>	18,000 – 22,000 <sup>3</sup>	6,000 - 7,000 <sup>3</sup>

## Pitt Hopkins Syndrome Census – initiated Q1 2023<sup>1</sup>



Clinical similarities between PTHS, Rett and Angelman syndromes calling for TCF4 screening in suspected Rett or Angelman patients<sup>4</sup>

## Opportunity to accelerate diagnosis



- Rising awareness
- ICD code assigned in 2020
- Enhanced genetic testing technologies
- Expanding ADDM network sites

<sup>1</sup> Pitt Hopkins Research Foundation (PHRF) (pithopkins.org)

<sup>2</sup> Brazil, Israel, South Korea, Australia and New Zealand

<sup>3</sup> Estimates based on United Nations population data 2022, derived by applying the estimated prevalence range to the populations under 60 years (urban population only for China)

<sup>4</sup> Takano et al, "Two percent of patients suspected of having Angelman syndrome have TCF4 mutations" Clin Genet. 2010 Sep;78(3):282-8; Armani et al, "Transcription factor 4 and myocyte enhancer factor 2C mutations are not common causes of Rett syndrome" Am J Med Genet A. 2012;158A(4):713-9

# Neuren is leading development of a first approved treatment for PTHS

## Neuren Program Status

- Orphan Drug designation in US and EU
- Phase 2 clinical development in the US under an IND
- Eligible for Rare Pediatric Disease Designation Priority Review Voucher program

## Limited products in development

Company	Product Development Stage
	<b>Phase 2 (top line results Q2 2024)</b>
#2	Phase 2 (research institute sponsored, focusing on GI symptoms)
#3	Phase 1/2a trial (not yet recruiting)
#4	Preclinical

## Neuren engaging with all stakeholders



**PITT HOPKINS  
RESEARCH  
FOUNDATION**

Leading clinicians

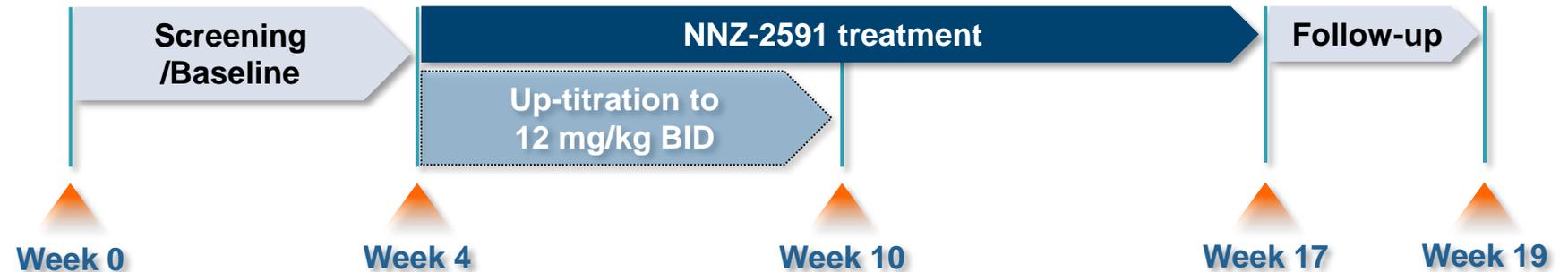


# Neuren's Phase 2 trial in children with PTHS

Top line results expected Q2 2024

**5 US sites:** Rush University, UTSW, UCSF, UAB, Colorado Children's Hospital

**Planned:**  
Up to 20 subjects, age 3-17



## Endpoints

- Primary endpoints are safety, tolerability and PK
- Secondary endpoints include 14 efficacy measurements
- A key objective is selection of the best primary efficacy endpoint or endpoints for a registration study

### Global

- CGI-I
- Caregiver Impression of Change (CIC)
- CGI-S

### GI Health

- GIHQ

### Symptom Specific

- Caregiver Top 3 Concerns

### Motor

- 2 Min Walk Test

### Sleep

- CSHQ

### Communication

- MB-CDI
- ORCA

### Quality of Life

- QI-Disability
- ICND

### Adaptive Behaviour / Self-Care

- Vineland Adaptive Behavior Scales

### Behaviour

- Aberrant Behavior Checklist-2
- Behavior Problems Inventory

# Highlights



# Highlights

1

DAYBUE™ (trofinetide) approved by US FDA as the first and only treatment for Rett syndrome, launched by partner Acadia in Apr 2023

2

Total economics to Neuren from global trofinetide partnership with Acadia up to US\$1bn<sup>1</sup> plus 10 to low 20s % royalties

3

Successful DAYBUE US launch, with 2023 net sales of US\$177m and 2024E net sales of US\$370-420m<sup>2</sup>

4

Accelerating Phase 2 development of NNZ-2591 in multiple indications. First results for Phelan-McDermid syndrome positive

5

NNZ-2591 novel mechanism of action has many more potential applications, with Rett and Fragile X licensed to Acadia

6

A\$243m cash at 31 Mar 2024 – well positioned to maximize the benefits of all value creating opportunities

<sup>1</sup> Including payments already received and future payments

<sup>2</sup> Acadia guidance reiterated in First Quarter 2024 Financial Results announcement in May 2024

# CONTACT

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+61 438 422 271

neuren

pharmaceuticals