XENON®

Investor Presentation

Corporate Overview

NOVEMBER 2024

Forward Looking Statement/Safe Harbor

This slide presentation and the accompanying oral commentary contain forward-looking statements that involve risks, uncertainties and assumptions. If the risks or uncertainties ever materialize or the assumptions prove incorrect, our results may differ materially from those expressed or implied by such forward-looking statements. All statements other than statements of historical fact could be deemed forward-looking and include statements regarding the timing of and potential results from clinical trials; the potential efficacy, safety profile, future development plans in current and anticipated indications, addressable market, regulatory success and commercial potential of our and our partners' product candidates; the efficacy of our clinical trial designs; our ability to successfully develop and achieve milestones in our azetukalner and other pipeline and development programs; the timing and results of our interactions with regulators; our ability to successfully develop and obtain regulatory approval of azetukalner and our other product candidates; anticipated timing of topline data readout from our clinical trials of azetukalner; and our expectation that we will have sufficient cash to fund operations into 2027.

These forward-looking statements are based on current assumptions that involve risks, uncertainties and other factors that may cause the actual results, events, or developments to be materially different from those expressed or implied by such forward-looking statements. These risks and uncertainties, many of which are beyond our control, include, but are not limited to: clinical trials may not demonstrate safety and efficacy of any of our or our collaborators' product candidates; promising results from pre-clinical development activities or early clinical trial results may not be replicated in later clinical trials; our assumptions regarding our planned expenditures and sufficiency of our cash to fund operations may be incorrect; our ongoing discovery and pre-clinical efforts may not yield additional product candidates; any of our or our collaborators' product candidates, including azetukalner, may fail in development, may not receive required regulatory approvals, or may be delayed to a point where they are not commercially viable; we may not achieve additional milestones in our proprietary or partnered programs; regulatory agencies may impose additional requirements or delay the initiation of clinical trials; the impact of market, industry, and regulatory conditions on clinical trial enrollment; the impact of competition; the impact of expanded product development and clinical activities on operating expenses; the impact of new or changing laws and regulations; the impact of unstable economic conditions in the general domestic and global economic markets; adverse conditions from geopolitical events; as well as the other risks identified in our filings with the U.S. Securities and Exchange Commission and the securities commissions in British Columbia, Alberta, and Ontario. These forward-looking statements speak only as of the date hereof and we assume no obligation to update these forward-looking statements, and readers are cautioned not to place undue reliance on such forward-looking statements.

About Xenon Pharmaceuticals

- Neuroscience-focused biopharma company and leader in small molecule, ion channel drug discovery and development
- Azetukalner, our **highly potent, selective Kv7 channel opener**, represents the most advanced, clinically validated potassium channel modulator in late-stage clinical development and the **only Kv7 molecule in development with efficacy and safety data** in epilepsy and MDD patients
  - Comprehensive intellectual property portfolio with patent coverage extending to at least 2040, absent any extensions of patent term
- Robust pipeline of therapeutic candidates targeting both potassium and sodium channels across various indications
- Strong financial position
  - $803.3 million in cash, cash equivalents and marketable securities as of September 30, 2024
  - Anticipated cash runway to fund operations into 2027

Xenon's Neuroscience-Focused Pipeline

	Clinical Trial/Partner	Pre-Clinical	Phase 1	Phase 2	Phase 3
Azetukalner (Potassium Channel Opener)					
Epilepsy: Focal Onset Seizures (FOS)	X-TOLE2				
Epilepsy: Focal Onset Seizures (FOS)	X-TOLE3				
Epilepsy: Primary Generalized Tonic-Clonic Seizures (PGTCS)	X-ACKT				
Major Depressive Disorder (MDD)	X-NOVA				
Major Depressive Disorder (MDD)*	Mount Sinai				
Pre-clinical Ion Channel Modulators					
Kv7 Potassium Channel Openers (*Epilepsy, pain, and neuropsychiatric indications*)					
Nav 1.7 Sodium Channel Inhibitors (*Pain indications*)					
Nav 1.1 Sodium Channel Openers (*Dravet Syndrome*)					
NBI-921352 (Partnered Program - Sodium Channel Inhibitor)					
Orphan Pediatric Epilepsy - SCN8A-DEE	Neurocrine Biosciences				

*Investigator sponsored Phase 2 non-registrational proof-of-concept study

This chart displays pipeline drug candidates currently undergoing clinical testing in a variety of disease indications. The safety and efficacy of these investigational drug candidates have not been fully evaluated, and they have not yet been approved for use by any regulatory authorities.

Azetukalner: Significant Potential Across Epilepsy and MDD

Robust Clinical Efficacy
- Highly compelling double-blind efficacy data in FOS patients, durable long-term seizure freedom data as demonstrated in the ongoing OLE
- Clinically meaningful activity in depression and significant reductions in anhedonia observed in MDD patients

Novel Mechanism
- Highly potent and selective Kv7.2/7.3 potassium channel opener with no activity on $GABA_A$

Rapid Onset of Effect
- Statistically significant efficacy demonstrated at Week 1 in patients with FOS and in patients with MDD

Ease-of-Use Attributes
- Once-daily dosing and no required titration, enabling potential for rational polypharmacy

Well-Documented Safety Profile
- More than 600 patient years of data in FOS patients, with some patients dosed for more than 5 years
- Potentially differentiated profile in MDD patients, with no notable weight gain or sexual dysfunction observed

Sources: French, et al, AES 2021, poster 1.419; not approved for use; Butterfield, et al, ASCP 2024, poster W67; not approved for use; French, et al, AES 2023, post 1.277; not approved for use; FOS: focal onset seizures; OLE: open-label extension; MDD: major depressive disorder; ASMs: anti-seizure medications

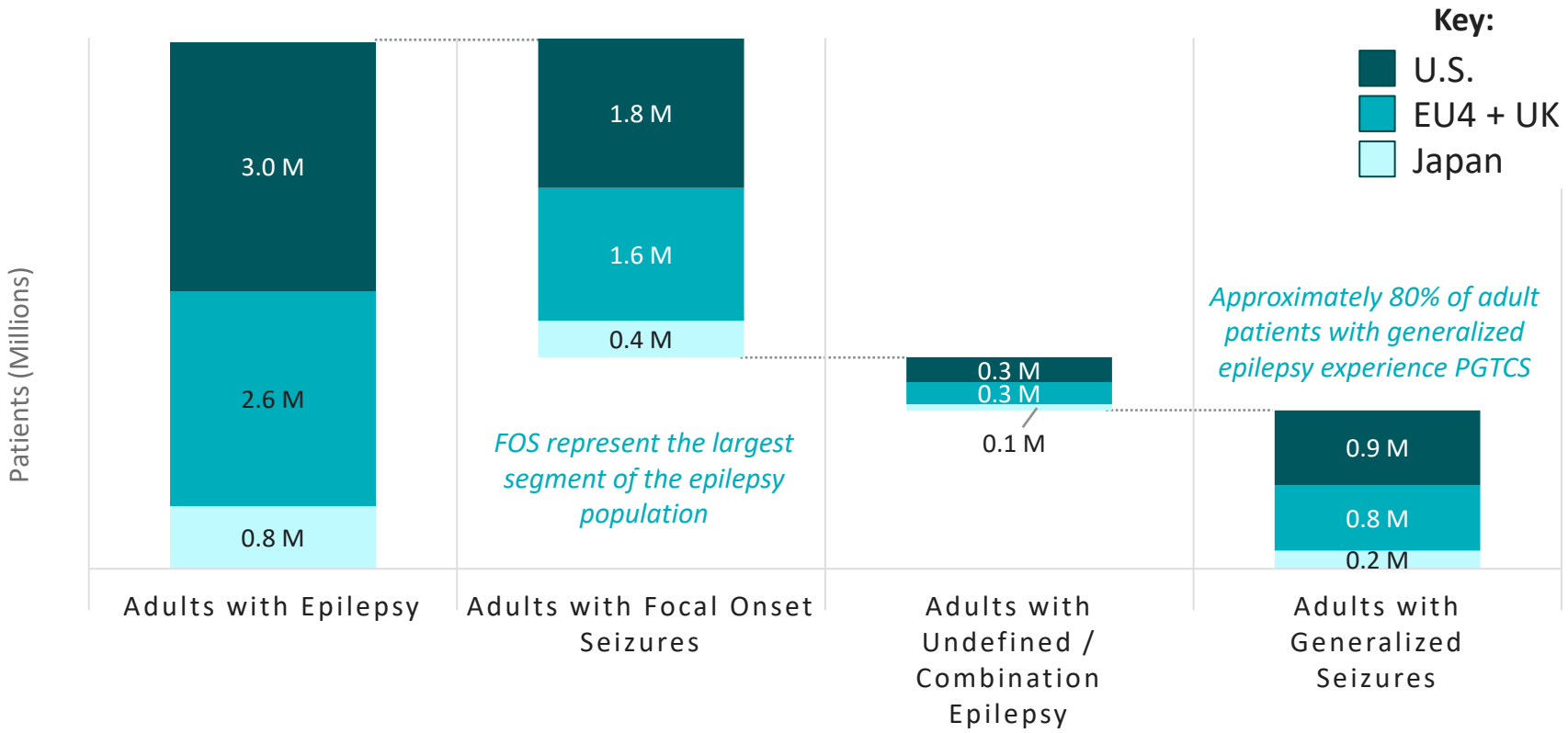
Addressing Persisting Unmet Needs

EPILEPSY

Significant Global Epilepsy Burden

- Epilepsy is the **fourth most common neurological condition**
- Hallmark symptoms include:
  - **focal seizures** that start in one brain hemisphere (either aware or unaware)
  - **generalized seizures** the most common of which are tonic clonic/convulsive seizures
- Despite the availability of multiple anti-seizure medications (ASMs), a **substantial unmet medical need exists**
- Rates of **comorbid depression** exist in up to 50% of epilepsy patients

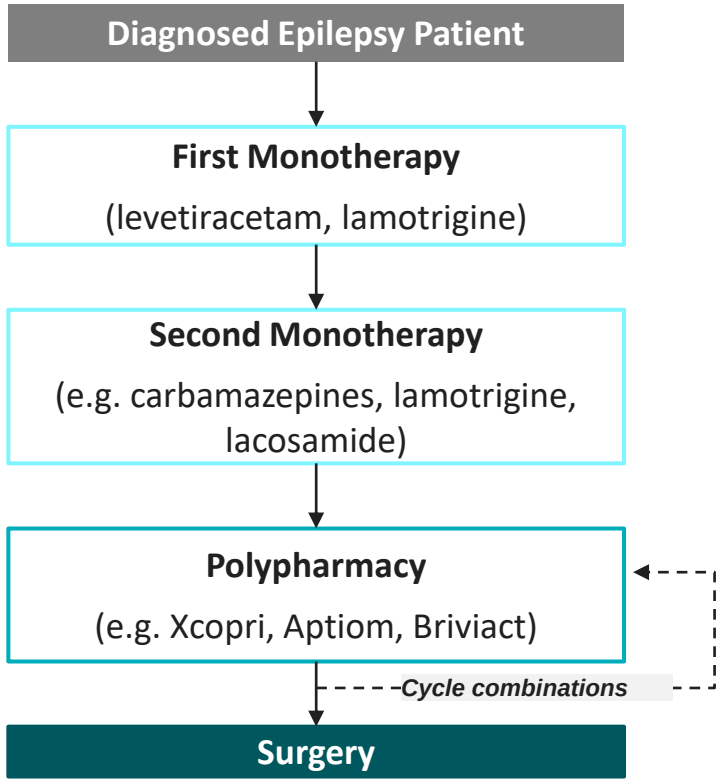
Estimated Diagnosed Adult Epilepsy Patient Population (2020)



Approximately 1 million children under the age of 18 have epilepsy across the three geographic regions

Sources: Xenon-sponsored market research; Mula, et al, *Effect of drug treatment changes and seizure outcomes on depression and suicidality in adults with drug-resistant focal epilepsy*, Epilepsia, December 11, 2023

Treatment Decisions are Highly Individualized and Complex



Focal and general epilepsy have similar treatment considerations, with select ASMs (e.g. valproate) used more frequently in FOS than in generalized

Treatment goal aims to optimize efficacy while managing tolerability

- Global treatment patterns are largely similar
- Levetiracetam and lamotrigine are commonly used in early lines of treatment
- Monotherapy switching in second line driven by desire for better seizure control or tolerability/AE issues

- Patients continuing to experience sub-optimal response (poor efficacy, tolerability) frequently receive polypharmacy
  - Combinations typically involve mechanistic differentiation from early lines of therapy
  - Branded therapies can potentially be accessed if a patient has tried and failed 1-2 generic ASMs

Significant opportunity remains with up to 50% of epilepsy patients requiring additional treatment options

Sources: Epilepsy Foundation; Epilepsy Currents, Englot (2018), National Association of Epilepsy Centers, National Institute of Neurological Disorders and Stroke; Company-sponsored market research

Azetukalner has the Potential to Address Multiple Unmet Needs in FOS

Desirable Attributes For New Therapeutics To Treat Focal Onset Seizures[1]

Greater Seizure Reduction & Seizure Freedom

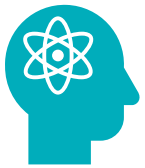
Despite availability of numerous ASMs, **up to 50% of epilepsy patients are insufficiently controlled with available ASM treatments**

Ease-of-Use Attributes

Many ASMs require **burdensome management of DDIs, and lengthy and complex titration periods** to avoid serious AEs, complicating treatment for patients

Novel Mechanism of Action

Despite 20+ available treatments, **most ASMs fall into three main mechanisms**, which limits therapeutic diversity for patients seeking improved efficacy



Impact on Mood

Few marketed ASMs have positive impact on mood, with some even having negative impacts, posing challenges given high rates of depression comorbidity

Rapid Onset of Effect

No marketed ASMs have demonstrated efficacy at Week 1, **exacerbating challenges for patients with ongoing seizures who seek therapeutic alternatives**

[1] Source: physician interviews; company-sponsored market research

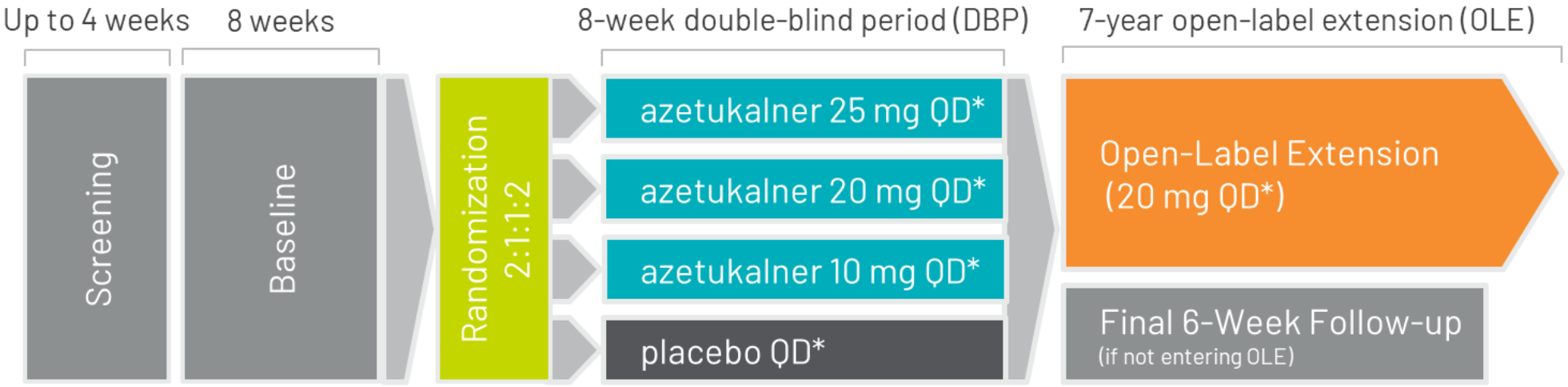
Compelling Azetukalner Data in Epilepsy

X-TOLE, X-TOLE2, X-TOLE3, AND X-ACKT CLINICAL TRIALS

X-TOLE Phase 2b Clinical Trial in Focal Onset Seizures

X-TOLE™

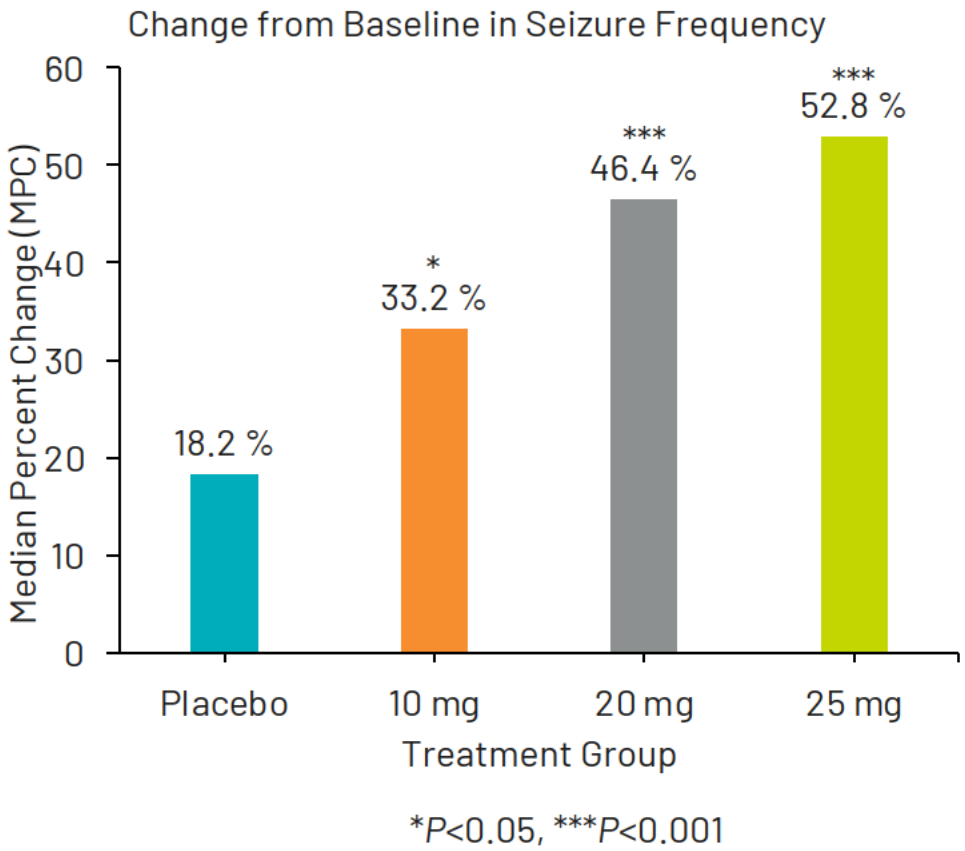
Phase 2b study and 7-year OLE

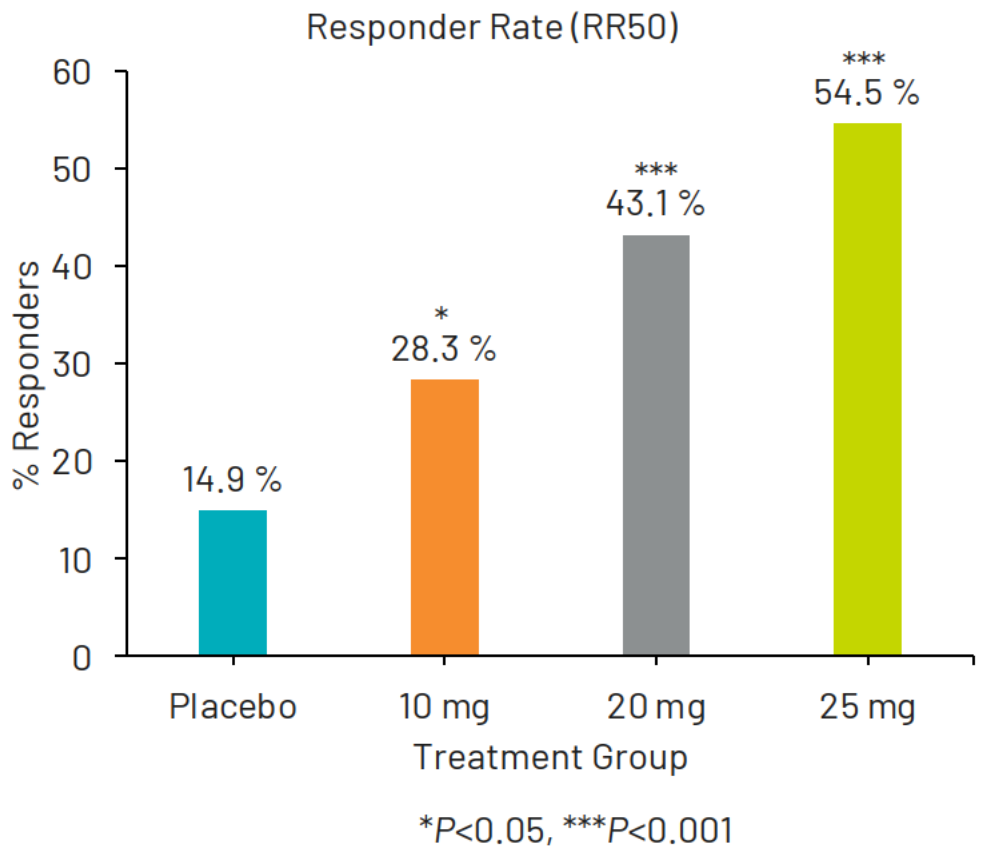


*Administered as a once-daily capsule with food with no titration period.

Topline results reported in October 2021 and subsequent *ad hoc* analyses and OLE data presented at AES meetings

Compelling Phase 2b Efficacy Results





Azetukalner (XEN1101) was administered as a once-daily capsule with food with no titration period.

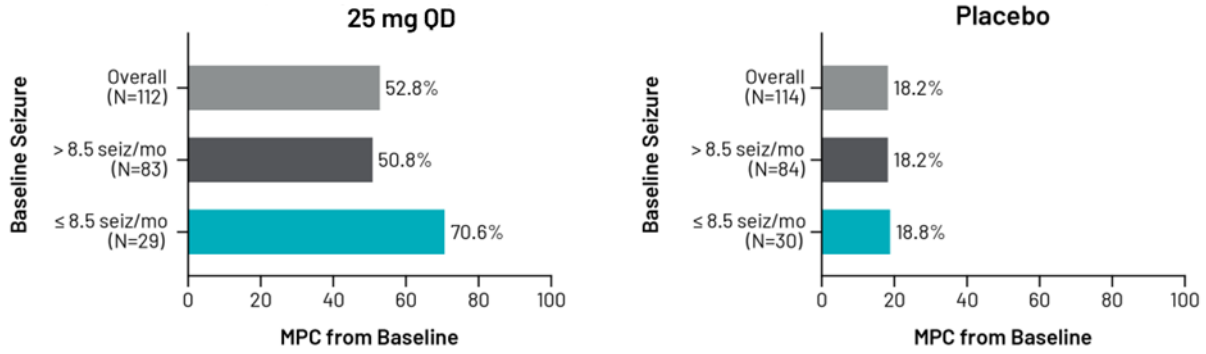
Highly significant and dose dependent reduction in seizures

Source: "Phase 2b Efficacy and Safety of XEN1101, a Novel Potassium Channel Modulator, in Adults with Focal Epilepsy (X-TOLE)." 2022 Annual Meeting of the American Epilepsy Society (AES).

X-TOLE Sub-Group Analyses (Double-Blind Period)

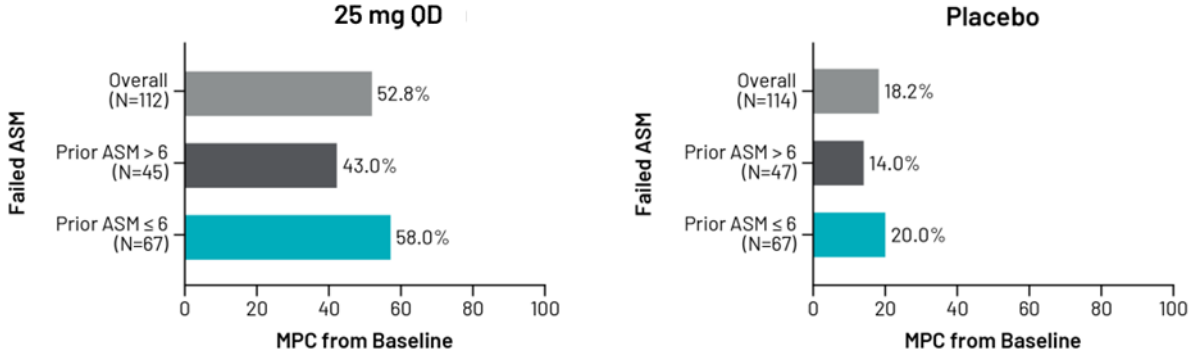
Baseline Seizure Sub-Group Analysis

- Seizure reduction was 70.6% for subjects with ≤ 8.5 seizures/month at baseline compared to 50.8% for those with > 8.5 seizures/month



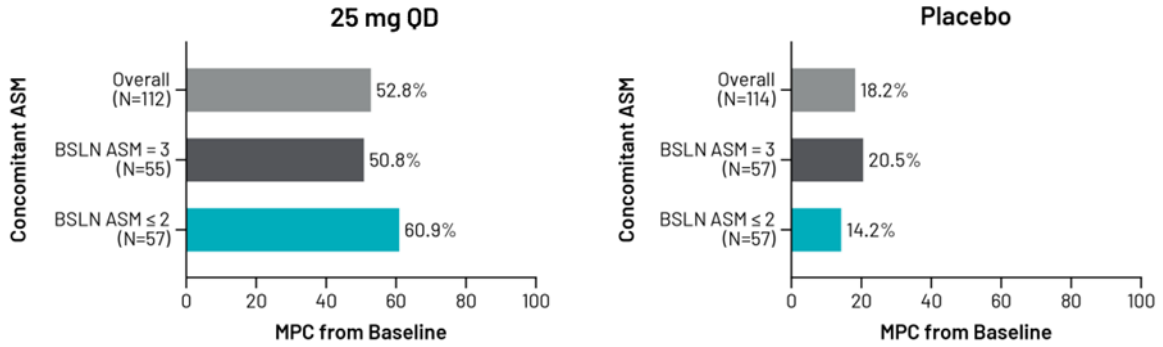
Prior Failed ASMs Sub-Group Analysis

- Median monthly FOS reduction was 58.0% in subjects who failed ≤ 6 ASMs at baseline and 43.0% in subjects who failed > 6 ASMs



Concomitant ASMs Sub-Group Analysis

- Median monthly FOS reduction was 60.9% for subjects with 1-2 concomitant ASMs and 50.8% for subjects with 3 concomitant ASMs

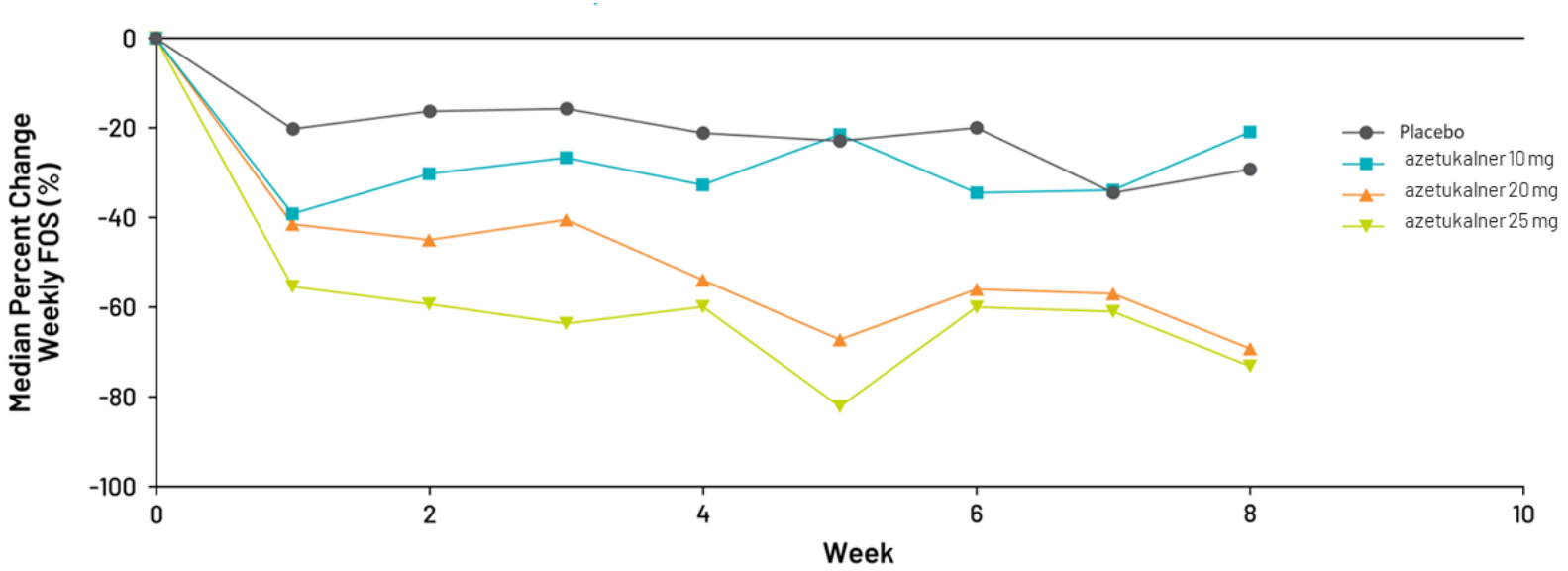


Notes: Azetukalner (XEN1101) was administered as a once-daily capsule with food. The post hoc analysis was categorized by ≤ 8.5 and > 8.5* seizures per month for baseline seizure burden, ≤ 6 and > 6 prior failed ASMs (median), and = 3 or ≤ 2 concomitant ASMs (pre-specified).

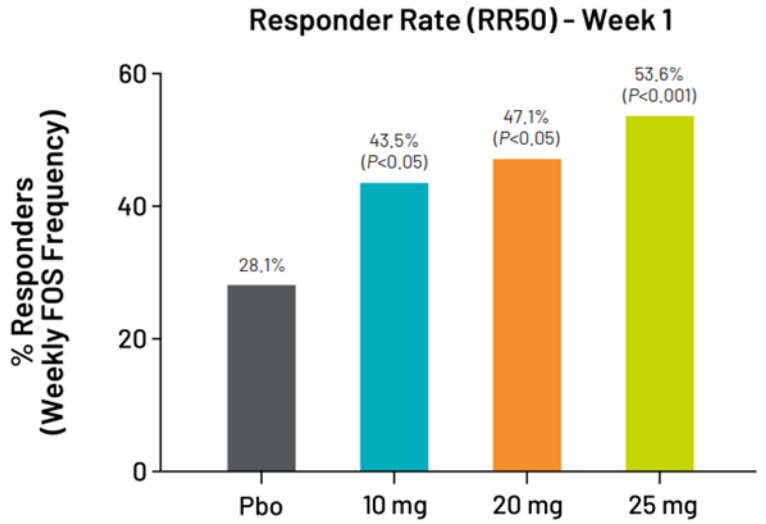
Source: "The Impact of Disease Severity on Efficacy From a Phase 2b Study of XEN1101, a Novel Potassium Channel Opener, in Adults With Focal Epilepsy (X-TOLE)." 2022 Annual Meeting of the American Epilepsy Society (AES).

Rapid Onset of Efficacy (Double-Blind Period)

Median Percent Change from Baseline in Weekly Focal Onset Seizure (FOS) Frequency in DBP



Responders (RR50) Based on Percent Change from Baseline for Week 1 in Weekly FOS Frequency in DBP



Azetukalner (XEN1101) was administered as a once-daily capsule with food with no titration period.

Marked reduction in median FOS frequency at Week 1 for all doses compared with placebo

Source: "Rapid Onset of Efficacy of XEN1101, a Novel Potassium Channel Opener, in Adults with Focal Epilepsy: Results from a Phase 2b Study (X-TOLE)." 2022 Annual Meeting of the American Epilepsy Society (AES).

X-TOLE: Safety and Tolerability Data

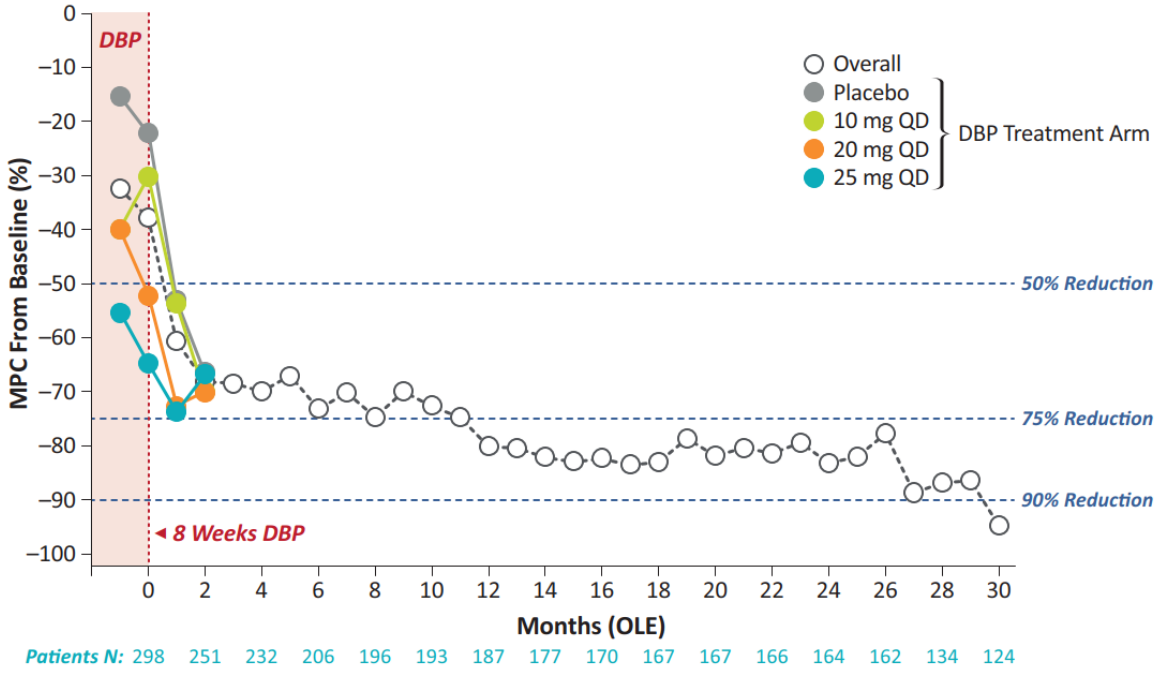
- X-TOLE Double-Blind Period
  - Azetukalner was generally well-tolerated in this study with adverse events consistent with other commonly prescribed ASMs
    - The most common reported treatment emergent adverse events (TEAEs) across all azetukalner dose groups were dizziness (24.6%), somnolence (15.6%) and fatigue (10.9%), as compared to the placebo group which reported dizziness (7.0%), somnolence (7.0%) and fatigue (5.3%)
    - The most common TEAEs leading to discontinuation across all azetukalner dose groups were dizziness (4.7%), balance disorder (2.4%), dysarthria (1.9%) and gait disturbance (1.9%)
    - Serious adverse events (SAE) incidence was low and balanced across groups (3.3% across all azetukalner dose groups as compared to 2.6% in the placebo group)
- X-TOLE Open-Label Extension*
  - Azetukalner 20 mg QD was generally well tolerated in OLE, and the safety profile observed was similar to that of the DBP; no new safety signals were identified

* Results are from interim data from the open-label extension of X-TOLE (cutoff date September 5, 2023).

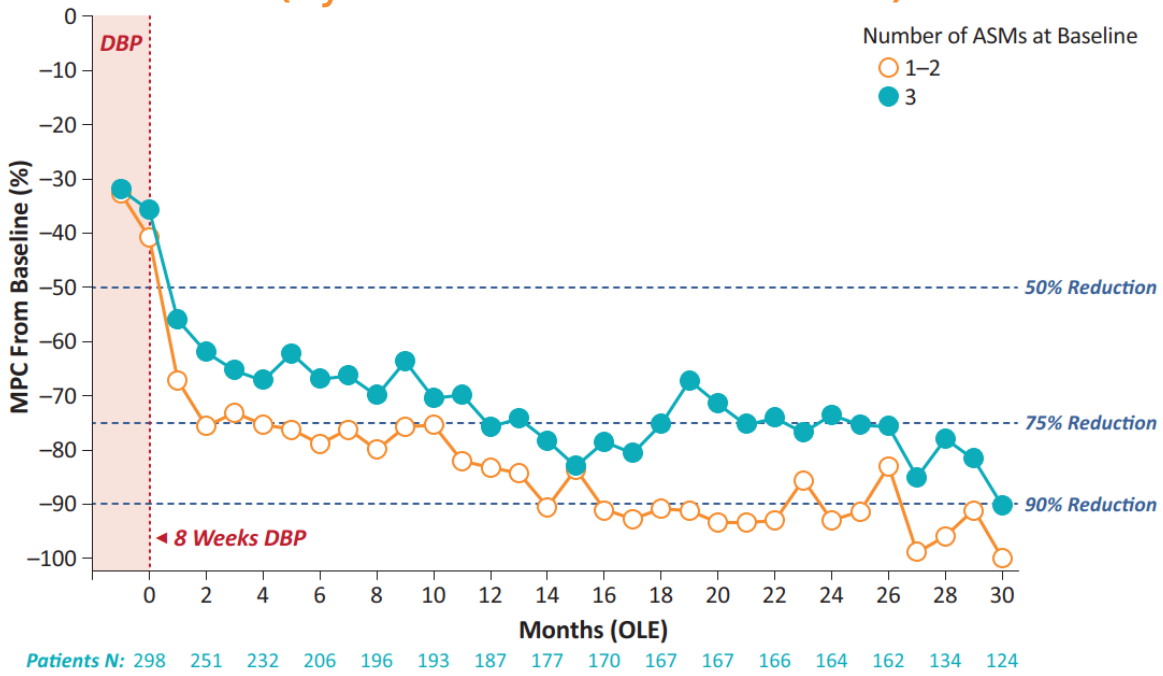
Sources: "Phase 2b Efficacy and Safety of XEN1101, a Novel Potassium Channel Modulator, in Adults with Focal Epilepsy (X-TOLE)." 2022 Annual Meeting of the American Epilepsy Society (AES).
"Interim Long-Term Safety and Efficacy of XEN1101, a Potent, Selective Potassium Channel Opener: Update From an Ongoing, Open-Label Extension of a Phase 2b Study (X-TOLE) in Adults With Focal Epilepsy." 2023 Annual Meeting of the American Epilepsy Society (AES).

Compelling Long-Term Efficacy Results in OLE

MPC in Monthly FOS Frequency During DBP and OLE



MPC in Monthly FOS Frequency During DBP and OLE (by Baseline Number of ASMs)

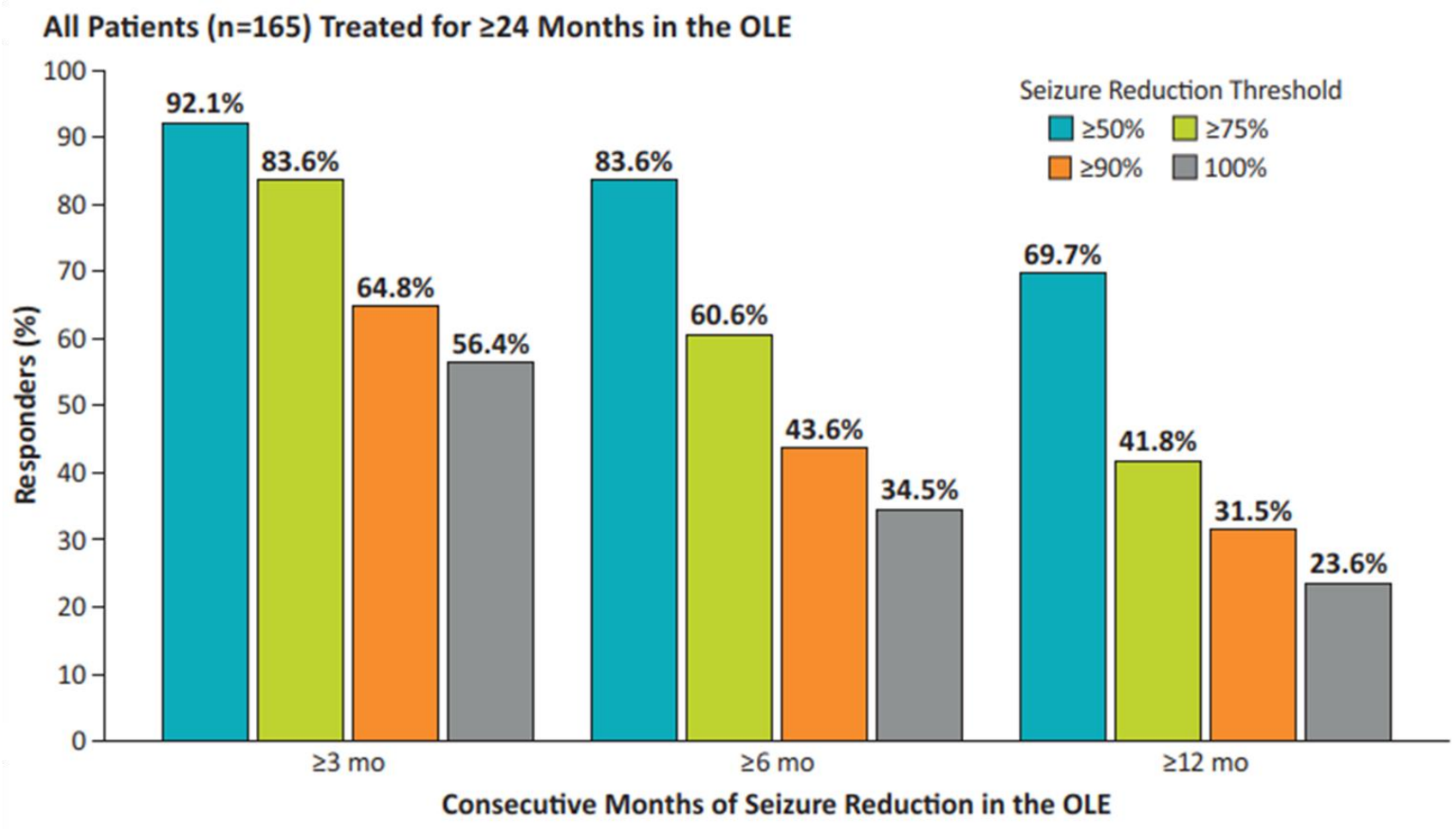


Notes: Azetukalner (XEN1101) was administered as a once-daily capsule with food with no titration period. Monthly seizure rate was calculated for 28 days per month. Following DBP, all patients received 20 mg QD with food at start of OLE. 1 patient was not included in seizure frequency data because of non-compliance with seizure diary. ASM, antiseizure medication; DBP, double-blind period; FOS, focal onset seizures; MPC, median percentage change; OLE, open-label extension. The results presented here are interim data from the open-label extension of X-TOLE (cutoff date September 5, 2023).

Sustained monthly reduction in seizure frequency in OLE from DBP baseline with even greater improvements in patients on fewer baseline ASMs

Source: "Interim Long-Term Safety and Efficacy of XEN1101, a Potent, Selective Potassium Channel Opener: Update From an Ongoing, Open-Label Extension of a Phase 2b Study (X-TOLE) in Adults With Focal Epilepsy." 2023 Annual Meeting of the American Epilepsy Society (AES).

Compelling Seizure Reduction and Seizure Freedom in the OLE



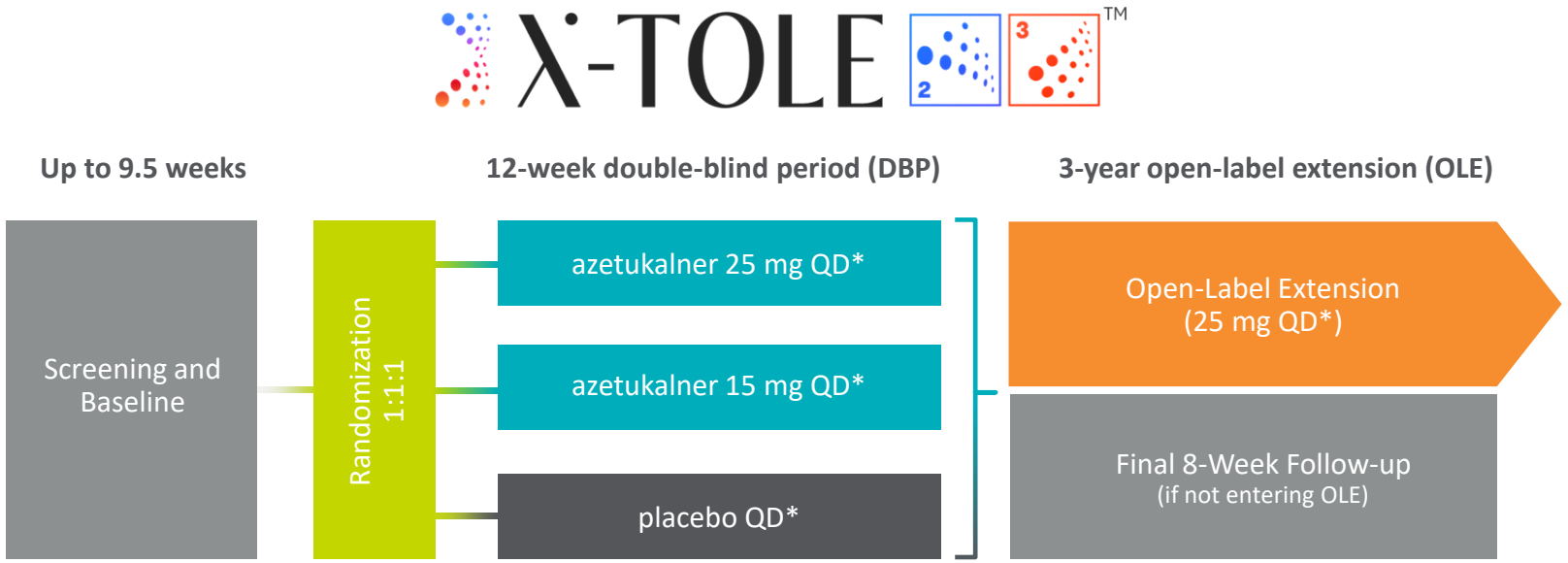
*These interim data (cutoff date September 5, 2023) are from the X-TOLE open-label extension in which patients received open-label azetukalner (XEN1101) at a dose of 20 mg once-daily (QD) with food.

Seizure freedom for ≥12-month consecutive durations was achieved in almost 1 in 4 patients

Source: "Interim Long-Term Safety and Efficacy of XEN1101, a Potent, Selective Potassium Channel Opener: Update From an Ongoing, Open-Label Extension of a Phase 2b Study (X-TOLE) in Adults With Focal Epilepsy." 2023 Annual Meeting of the American Epilepsy Society (AES); Seizure freedom defined as a 100% reduction in seizures

X-TOLE2 and X-TOLE3 Phase 3 Clinical Trials in FOS

- Xenon's Phase 3 epilepsy program in focal onset seizures and primary generalized tonic-clonic seizures is underway
- Plan to submit NDA supported by efficacy data from Phase 2b study (X-TOLE) and first Phase 3 study (X-TOLE2)
- Conducting two identical multi-center, placebo-controlled Phase 3 FOS trials (N = ~360 in each study)



*Administered as once-daily capsule with food no titration period.

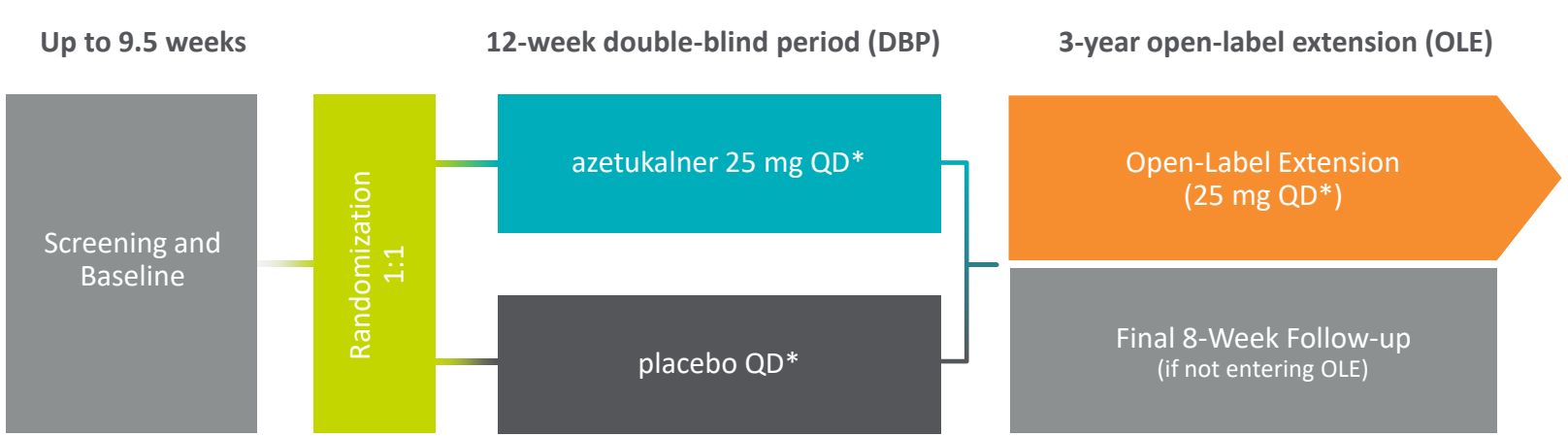
- **Primary Objective:** assess effect of azetukalner vs placebo on reducing focal onset seizure frequency
- **Secondary Objectives** include assessing the effect on azetukalner vs placebo on RR50, early treatment effect as measured at Week 1, and PGI-C

X-TOLE2 topline data anticipated in second half of 2025

X-ACKT Phase 3 Clinical Trial in PGTCS

- Significant unmet need remains in PGTCS despite available treatment options and an opportunity remains for a broad-spectrum agent with activity across seizure types
- Conducting a single, multi-center, placebo-controlled Phase 3 trial to support registration (N = ~160)

X-ACKT™



*Administered as once-daily capsule with food no titration period. Subjects aged ≥12 years and <18 years will receive either azetukalner 15mg, azetukalner 25 mg, or placebo; subjects aged ≥18 years will receive either azetukalner 25 mg or placebo. There is no placebo dose in the OLE.

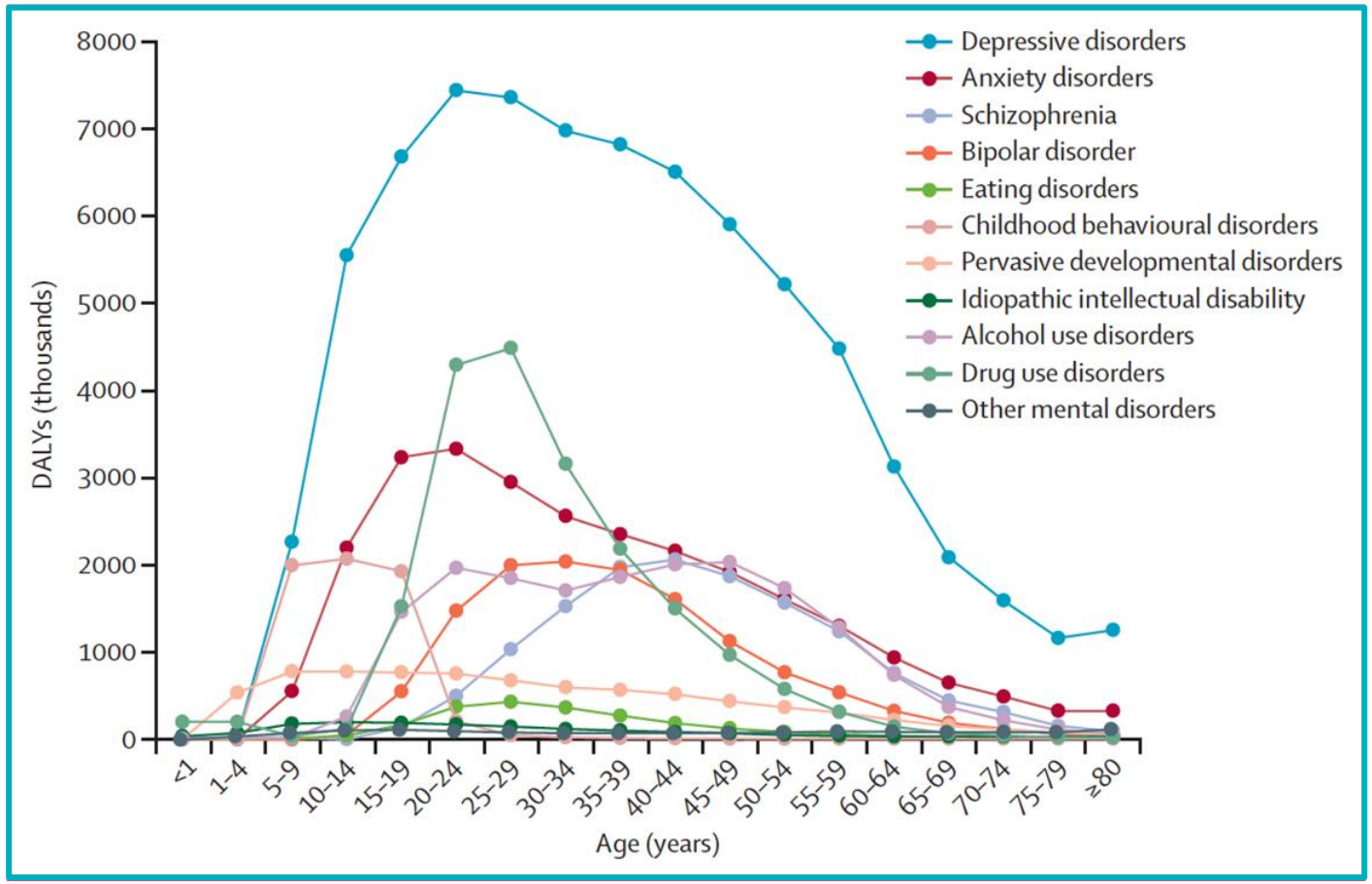
- **Primary Objective:** assess effect of azetukalner vs placebo on reducing frequency of primary generalized tonic clonic seizures
- **Secondary Objectives** include assessing the effect on azetukalner vs placebo on RR50, seizure freedom and PGI-C

Expanding Azetukalner in MDD

MDD is a Highly Prevalent Mental Health Disorder

- In 2022, the MDD diagnosed prevalent population in the U.S. was approximately 21 million adults
  - ~55% treated with pharmacotherapy
  - 1 in 3 patients are inadequately managed on pharmacotherapy
- Anhedonia is a common comorbidity of MDD
  - Associated with poorer treatment outcomes

Depression Accounts for Greatest Disability Among All Central Nervous System Disorders



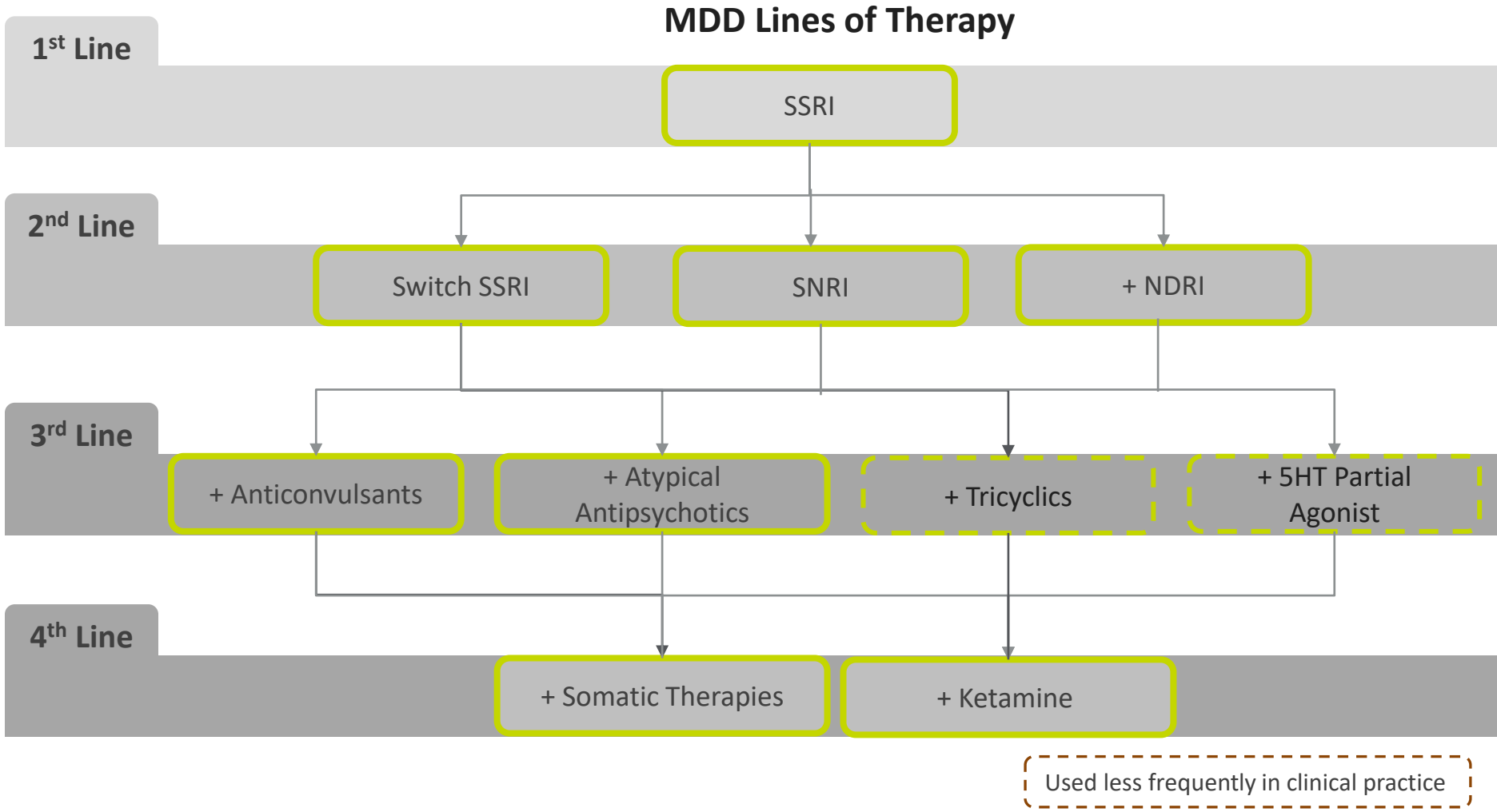
Disability-adjusted life years (DALYs) for each mental and substance use disorder in 2010, by age

Sources: Whiteford et al. Global burden of disease attributable to mental and substance use disorders: findings from the Global Burden of Disease Study 2010. *Lancet.* 2013; Kern et al. Treatment patterns and sequences of pharmacotherapy for patients diagnosed with depression in the United States: 2014 through 2019. *BMC Psychiatry*. 2020; Fava, M. Definition and epidemiology of treatment-resistant depression. *Psychiatry Clin North Am*. 1996.

Opportunity to Improve MDD Treatment Paradigm

Treatment Considerations

- Physicians typically use multiple SSRIs/SNRIs, prior to progressing to branded therapy
- Poorly managed patients may seek alternative MOAs in 3L+
- Opportunity exists for novel mechanisms that offer efficacy in anhedonia with a differentiated safety profile



Source: Xenon-sponsored market research

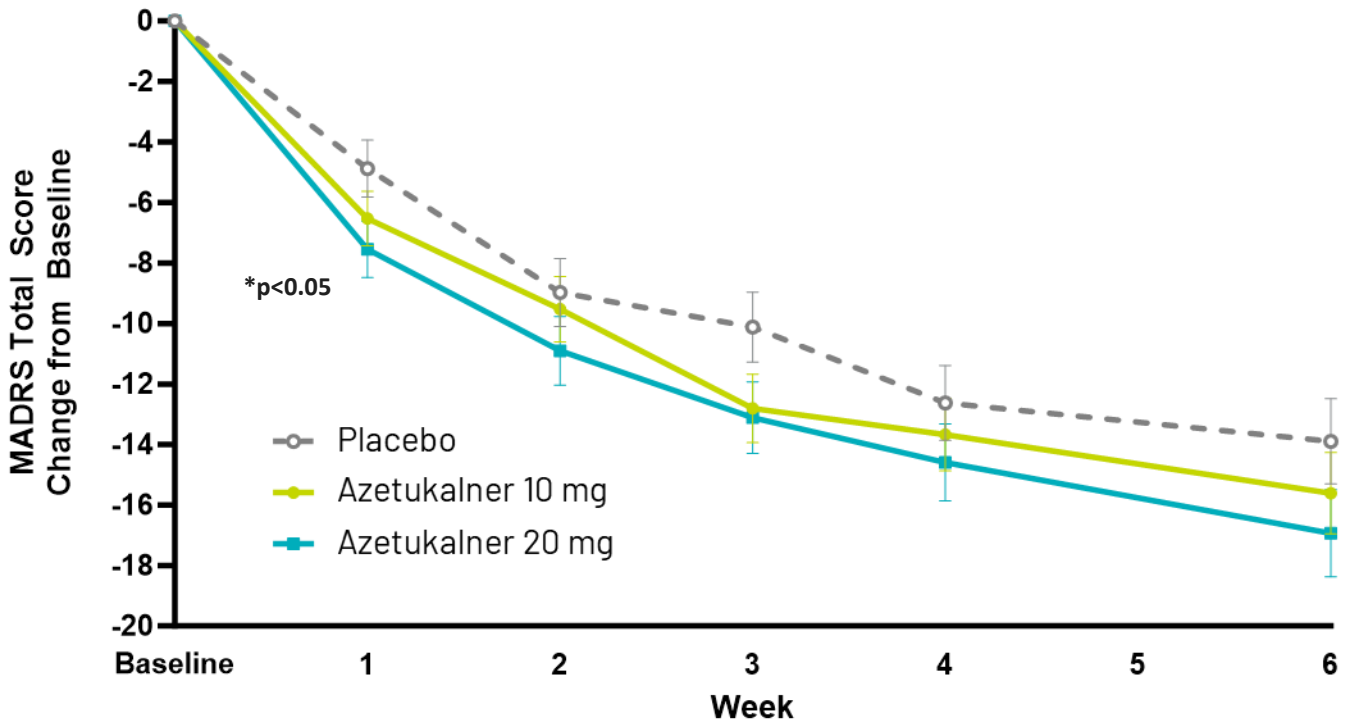
X-NOVA Phase 2 Proof-of-Concept Clinical Trial in MDD

- Conducted a Phase 2 proof-of-concept, randomized, double-blind, placebo-controlled, multicenter study to evaluate the safety, tolerability, and efficacy of azetukalner in major depressive disorder (MDD)

- **Primary Objective:** Montgomery-Åsberg Depression Rating Scale (MADRS) score change through Week 6
- **Key Secondary Objective:** Snaith-Hamilton Pleasure Scale (SHAPS) score change through Week 6

Topline data from Phase 2 X-NOVA study announced in November 2023

Primary Efficacy Endpoint:
Change in MADRS Total Scores at Week 6 (mITT)



	Placebo (N=54)	Azetukalner 20 mg (N=53)
ΔMADRS from BL at **Wk 6** (LS mean)	-13.90	**-16.94**
Diff. vs Pbo		**-3.04**
p-value		0.135

MADRS = Montgomery Åsberg Depression Rating Scale; LSMean (SEM) shown
mITT Population: All randomized subjects who receive at least 1 dose of study treatment and at least 1 post randomization MADRS

A clear dose response and a clinically meaningful 3.04 difference in MADRS at Week 6 in the 20 mg group

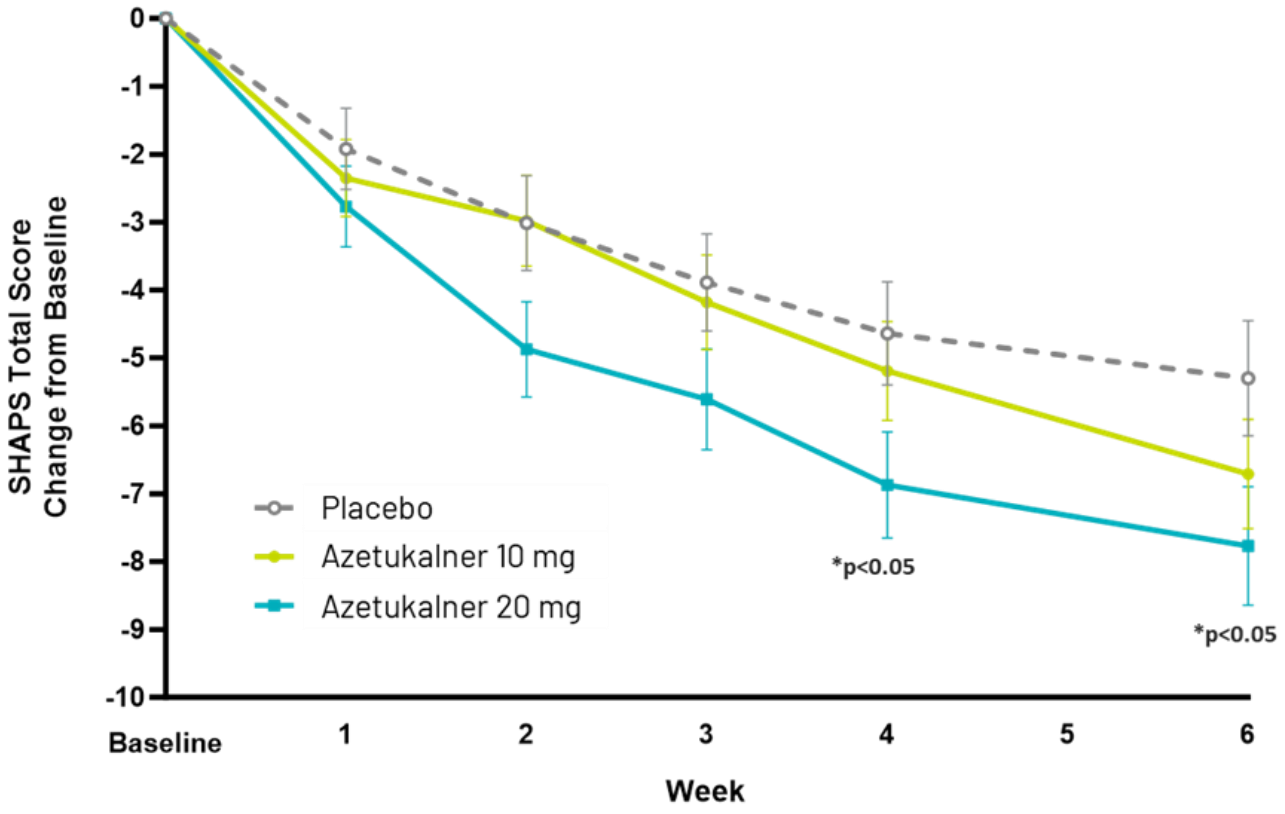
Pre-Specified Endpoint
Improvement in Depressive Symptoms:
Change in HAM-D17 Total Score at Week 6 (mITT)

	Placebo (N=54)	Azetukalner 20 mg (N=53)
HAM-D17 total score change from baseline at **Week 6** (LS mean)	-10.18	-13.26
Difference vs. placebo		-3.08
p-value		0.042*

HAM-D17: Hamilton Depression Rating Scale was assessed at screening, baseline, and Week 6

Improvement in depressive symptoms assessed by HAM-D17 total scores was statistically significant at Week 6

Secondary Efficacy Endpoint:
Change in SHAPS Total Score at Week 6 (mITT)



	Placebo (N=54)	Azetukalner 20 mg (N=53)
SHAPS total score change from baseline at Week 6 (LSMean)	-5.30	-7.77
Difference vs. placebo		-2.46
p-value		**0.046***

SHAPS = Snaith-Hamilton Pleasure Scale; LSMean (SEM) shown

Anhedonia symptom improvement: statistically significant change in SHAPS at Week 6 in 20 mg group

X-NOVA: Safety and Tolerability Data

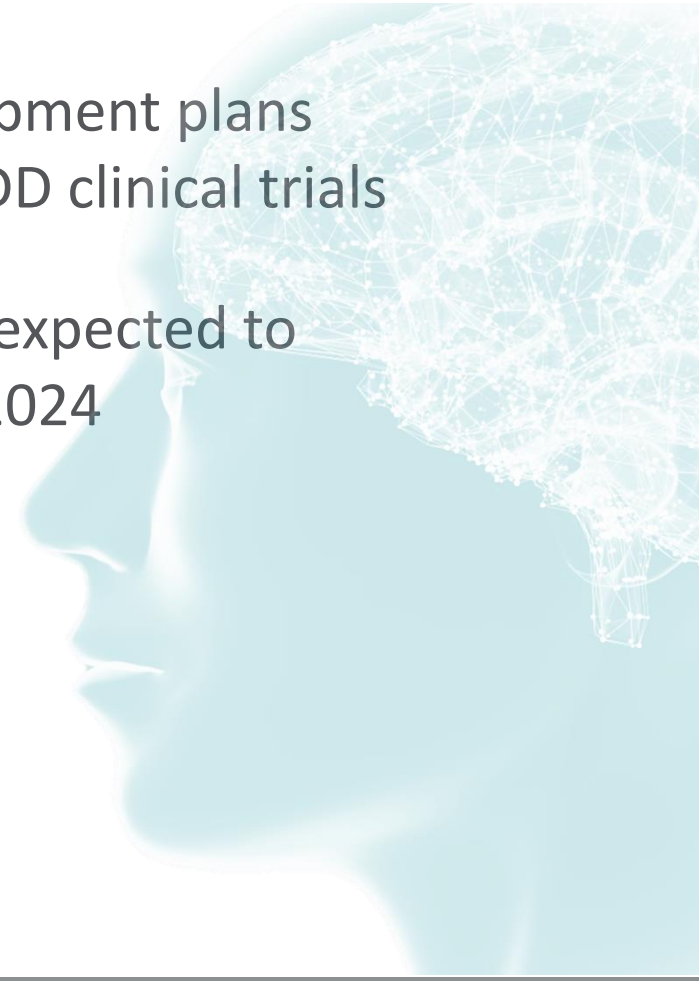
- Azetukalner was generally well-tolerated with similar rates of overall adverse events reported across all treatment arms
  - The most commonly reported TEAEs in the azetukalner 20 mg group included dizziness (17.9%), somnolence (10.7%), headache (8.9%) and disturbance in attention (8.9%), as compared to the placebo group which reported dizziness (7.3%), somnolence (1.8%), headache (12.7%) and disturbance in attention (0%)
  - Rates of discontinuation were similar across all treatment arms and rates of discontinuation due to TEAEs were low with three patients in the azetukalner 20 mg group (5.4%), as compared to two patients in the placebo group (3.6%)
  - No SAEs were reported in the two azetukalner treatment groups, and there were two patients (3.6%) in the placebo group who experienced a treatment-emergent SAE
  - Azetukalner was not associated with notable weight gain; patients did not report notable sexual dysfunction

- Novel mechanism of action
- Potential for anhedonia benefit
- Lack of notable sexual dysfunction or weight gain
- Rapid efficacy as demonstrated by statistical significance at Week 1
- Efficacy in-line with other approved therapeutics in MDD

Potential to offer a compelling clinical profile for MDD patients with residual unmet medical need

Next Steps in Azetukalner Phase 3 MDD Program:

- Late-stage clinical development plans include three Phase 3 MDD clinical trials
- First Phase 3 MDD study expected to initiate before year-end 2024



Source: Xenon-sponsored market research

Early-Stage Programs

POTASSIUM & SODIUM CHANNEL SCIENCE

Xenon's Ongoing Pre-Clinical and Product Life Cycle Work

- Leveraging Xenon's deep ion channel expertise to develop promising drug candidates that target sodium and potassium channels
- IND-enabling studies underway with multiple Kv7 development candidates and lead Nav1.7 development candidate
- Expect to nominate lead Nav1.1 candidate in 2025

Potassium Channel Program

- Strong conviction in broad applicability of Kv7 mechanism and strength of Xenon's discovery platform
- Next gen molecules to be explored in epilepsy and MDD
- Further potential pipeline expansion into other psychiatric indications beyond MDD, as well as pain and potentially other disorders

Sodium Channel Program

- Leveraging Xenon's extensive knowledge and prior work to advance Nav1.7 program in pain
  - Xenon scientists contributed to early work linking loss of function in SCN9A gene (Nav1.7) to pain, based on strong human genetic validation
- Nav1.1 channel work in epilepsy, based on genetic evidence of underlying pathophysiology of Dravet Syndrome

Potential Value-Creating Milestone Opportunities

Azetukalner Epilepsy Program

- Phase 3 clinical trials (X-TOLE2/X-TOLE3) in FOS underway; X-TOLE2 topline data expected in 2H:2025
- Phase 3 clinical trial (X-ACKT) in PGTCS underway to support registration in additional epilepsy indication
- NDA submission planned based on efficacy data from Phase 2b X-TOLE and first Phase 3 trial (X-TOLE2)

Azetukalner MDD Programs

- Initiate first of three planned Phase 3 studies in MDD by year end 2024
- Mount Sinai investigator-sponsored Phase 2 POC in MDD underway, with enrollment complete and data anticipated in 1H:25
- Evaluating potential development in additional neuropsychiatric indications

Pre-clinical Programs

- Leveraging Xenon's extensive ion channel expertise to identify validated drug targets and develop new Kv7, Nav1.1, and Nav1.7 product candidates; evaluating multiple therapeutic candidates with the goal of filing multiple INDs, or equivalent, in 2025

Partnered Programs with Neurocrine Biosciences

- Phase 2 clinical trial underway with NBI-921352 in pediatric SCN8A-DEE
- Nav1.2/1.6 inhibitor in IND-enabling studies with intent to progress into human studies in 2025 as potential treatment for FOS

For more information

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