



Santhera Pharmaceuticals

Developing medicines to meet the needs of
patients living with rare diseases

Corporate Presentation

April 2024

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Santhera Pharmaceuticals Corporate Snapshot

SIX Swiss Exchange listed company (SANN)

Global headquarters near Basel (Switzerland) with internationally experienced leadership team
Own commercialization of lead asset in EU core countries
Strong rare disease development capabilities

AGAMREE® (vamorolone) in Duchenne muscular dystrophy

Approvals by three authorities (US, EU, UK)

Approved by FDA (10/2023), EMA/EC (12/2023) and MHRA (01/2024) for use in DMD
Launched in Germany by Santhera and U.S. by partner Catalyst
NDA filed in China and priority review granted to partner Sperogenix
Differentiated safety profile addresses needs across broad DMD patient segments
Potential as alternative to corticosteroids in range of other therapeutic indications

Finance

Cash runway into 2025 including commercial EU infrastructure & launch
Major shareholders: Catalyst Pharmaceuticals, Inc. 11.2%; Idorsia 10.3%

Santhera value driver in DMD with broad therapeutic potential

AGAMREE® (vamorolone) foundational therapy in DMD

- U.S. FDA full approval on October 26, 2023; US launch on March 13, 2024
- EC full approval on December 18, 2023; German launch on Jan 15, 2024
- MHRA full approval on January 11, 2024
- Potential as alternative to corticosteroids in broad range of therapeutic areas
- Own commercialization in top-5 Europe (Germany, UK, France, Italy, Spain), plus Benelux, Austria, Switzerland. Commercialization in other countries via partner(s)
- Peak potential > EUR 150 million in DMD (in Santhera own markets)¹
- Commercialization in the U.S. by partner Catalyst, in China by partner Sperogenix

**Worldwide rights for all indications
(vamorolone partnered in North America & China)**

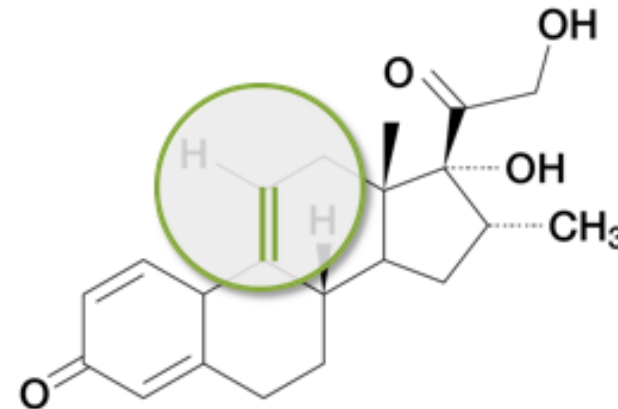


Lead asset AGAMREE® in DMD approved by FDA, EMA and MHRA

Launch in Germany as of January 15 by Santhera and on March 12, 2024, in the U.S. by Catalyst
NDA filed in China and priority review granted to partner Sperogenix on March 27, 2024

Molecule	Study / Indication	PoC	Pivotal	Filing	Market	Phase 4	Remarks
Vamorolone <ul style="list-style-type: none"> • dissociative steroid • oral suspension 	DMD development VISION-DMD						North America & China partnerships
	DMD long-term extension GUARDIAN						Establish long-term benefit in DMD for patients on drug for 6+ years
Life cycle management	Becker muscular dystrophy						Trial under FDA grant to partner
	Steroid alternative in rare pediatric indications						Plans to be disclosed

**AGAMREE® (vamorolone) in
Duchenne muscular dystrophy and
potentially other inflammatory disorders**





DMD offers attractive opportunity in well-defined orphan disease market

The DMD indication with few current treatment options is a fast-growing multi-billion market

- Approx. 30,000 – 35,000 patients in U.S. and Europe combined
- Well defined standard of care with corticosteroids as lead chronic treatment in established guidelines
- Patients diagnosed at early age and accessible
- Limited number of specialized centers
- Well knowledgeable patient advocacy groups
- Newer therapies likely to be used in combination with corticosteroids

Focused expert centers treating patients in EU and U.S.



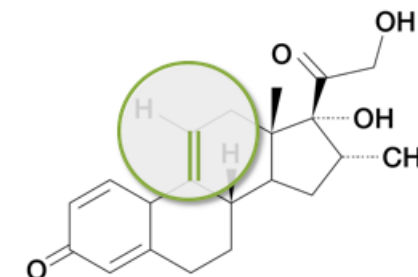
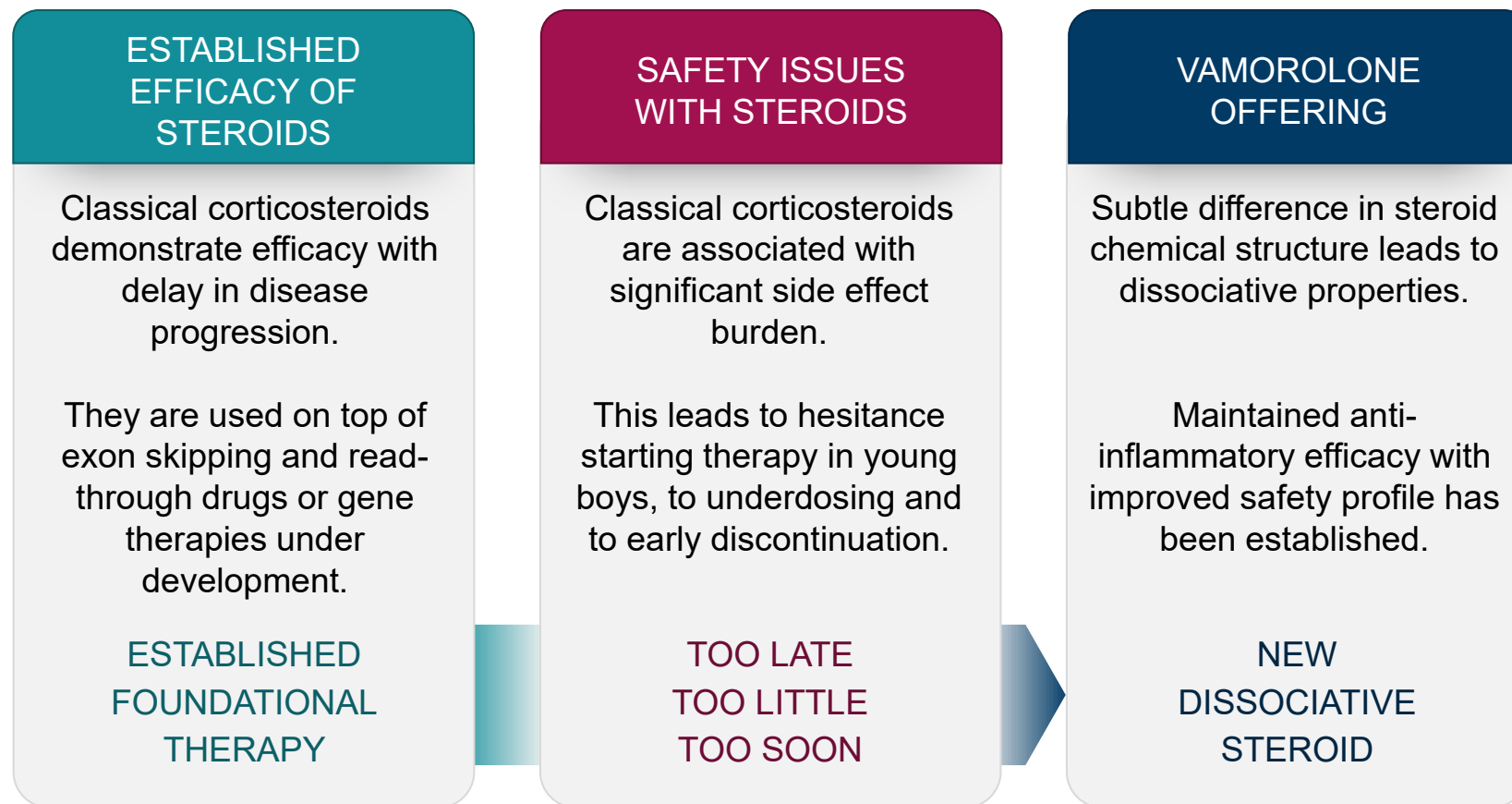
DMD	Centers	HCPs
U.S.	~90	~450
EU4+UK	~180	~750

Current approved therapies command high price with intrinsic limitations to serve addressable market

- Exon skippers and read through therapies serve niche segments based on genetic mutation
- Gene therapies deliver micro-dystrophin partially restoring function with re-dosing challenges
- Deflazacort (corticosteroid) is approved in U.S. (Emflaza®), achieves attractive margins

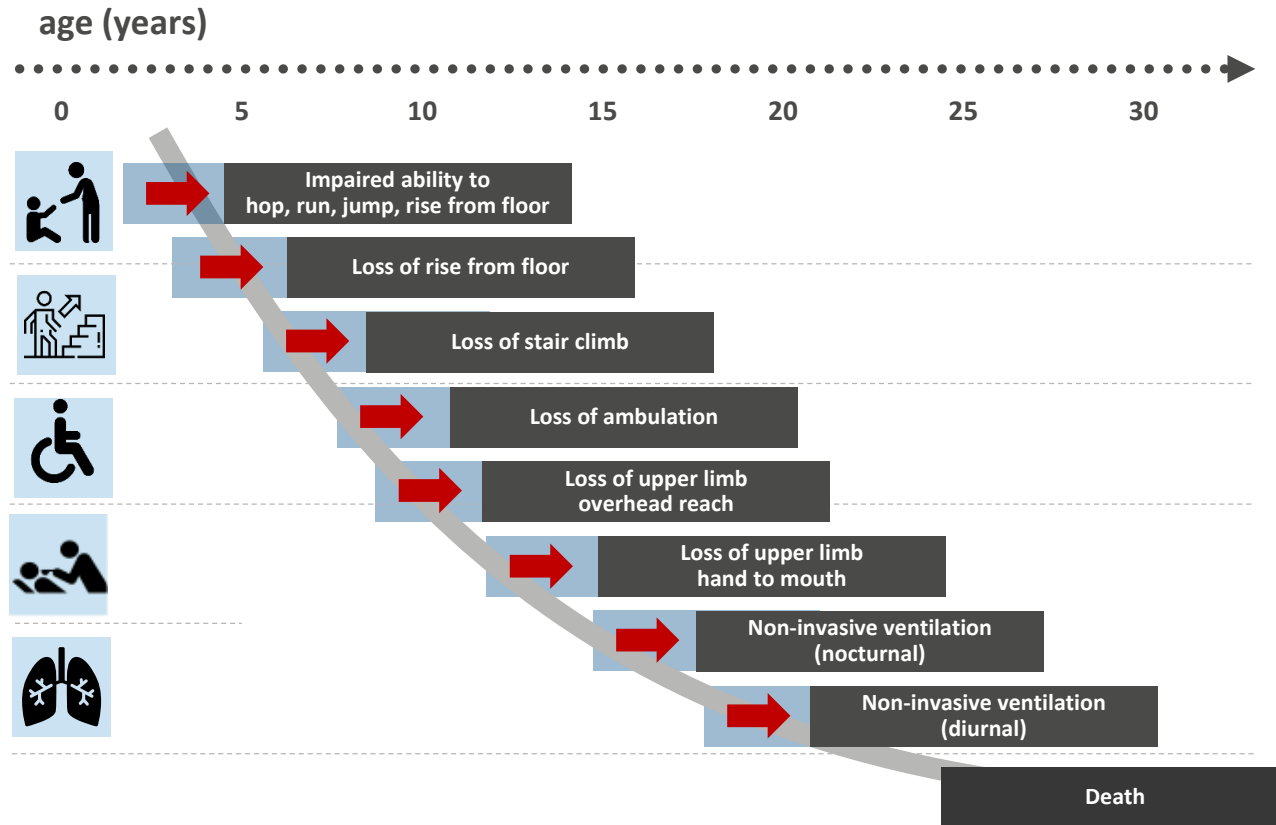
AGAMREE® can fill the need for a better foundational therapy in DMD

Corticosteroids delay disease progression by 2-3 years, but associated toxicities limit their use



Corticosteroids delay disease progression in DMD by 2 – 3 years^{4,6}

Established endpoints and consistent evidence base through several clinical studies

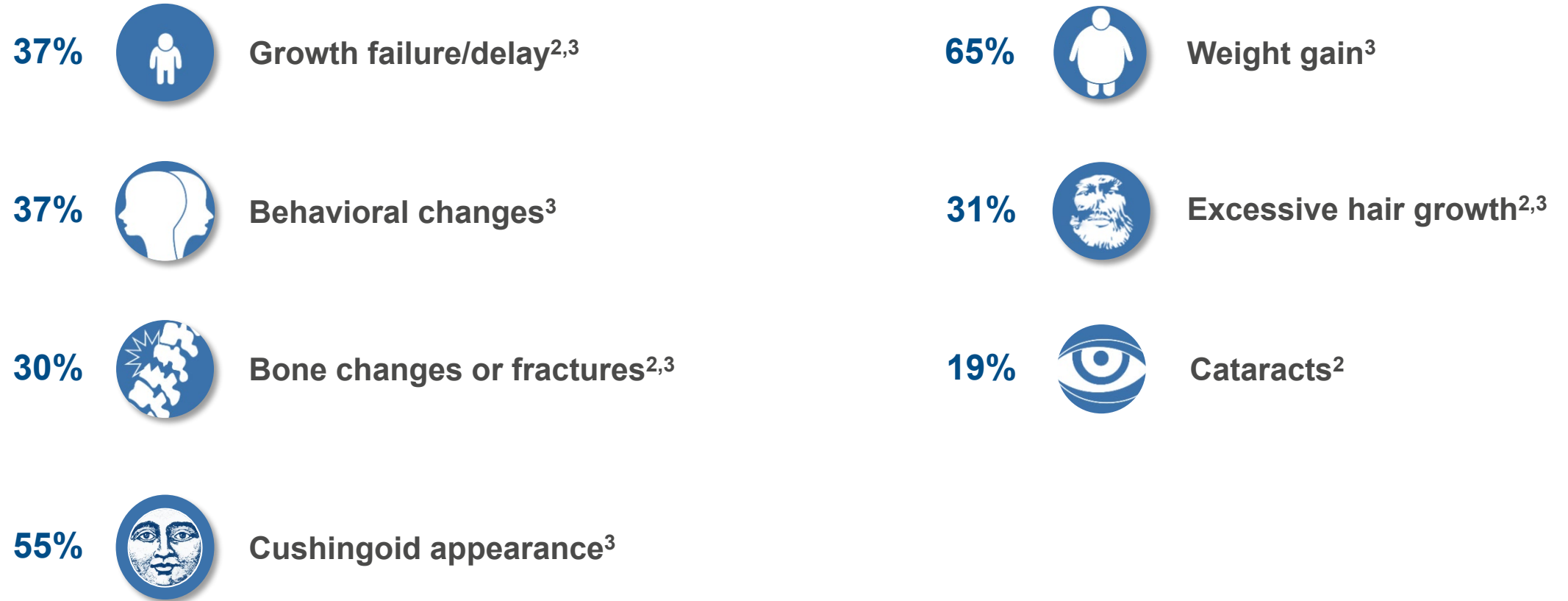


Corticosteroids are the standard of care

- DMD progression is sequential, non-linear and irreversible¹⁻⁴
- Early initiation of corticosteroids preserves muscle function and strength, delaying time to loss of functional milestones by 2 – 3 years^{4,6}
- Steroid treatment associated with a reduction in all-cause mortality, new onset and progressive cardiomyopathy⁵

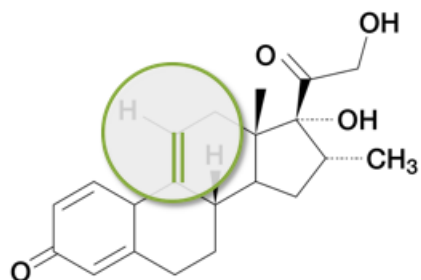
Corticosteroid treatment is associated with well-defined toxicities

...up to 65% of DMD patients discontinue treatment early due to adverse events¹⁻³



AGAMREE® (vamorolone) dissociative properties

Subtle but impactful difference in chemical structure separates vamorolone from classical steroids¹⁻⁵



Signature double bond impacts receptor binding and alters enzyme and membrane interactions



Like corticosteroids, efficacy maintained by potent anti-inflammatory action

- Retained inhibition of NF-κB pro-inflammatory transcription factor

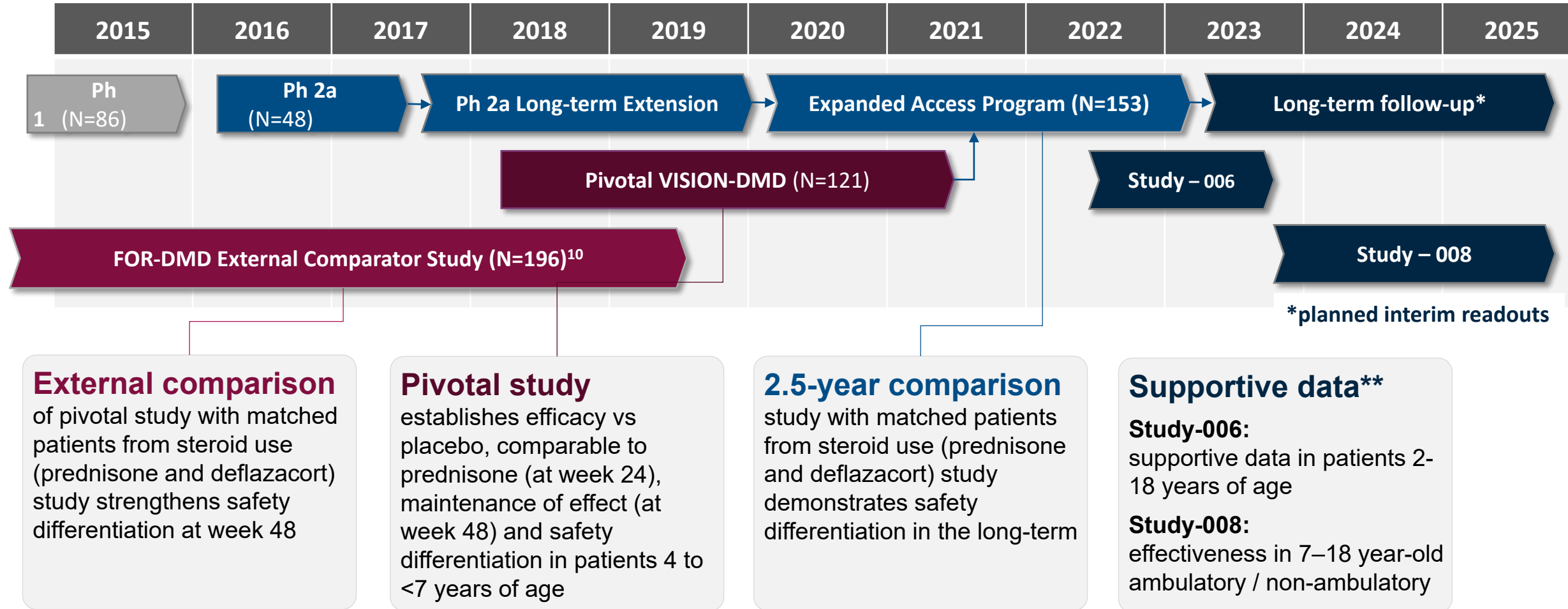


Unlike corticosteroids, potential for reduction of steroid-associated side effects

- Less activation of genes related to side effects
- Not a substrate of hydroxysteroid dehydrogenase
- Potent mineralocorticoid antagonist (eplerenone-like)
- Membrane stabilizer

Comprehensive AGAMREE® (vamorolone) development²⁻⁹

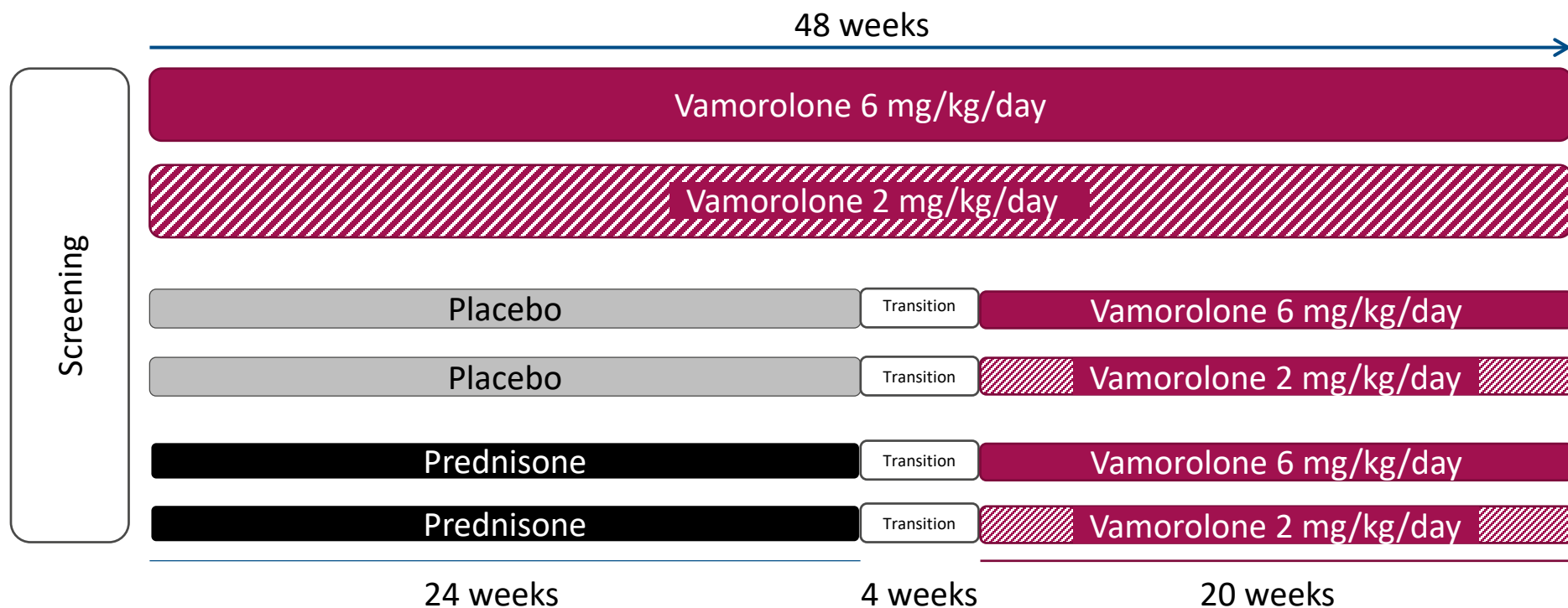
200 patient-years exposure in 160 DMD boys treated with vamorolone for up to 7 years¹



1. Data on File VAM-2021-001, 2. Hoffman et al. Steroids (2018); 3. Conklin et al. Ph. Res. (2018); 4. Hoffman et al. Neurology. (2019); 5. Smith et al. PLOS Med. (2020); 6. Mah et al, JAMA Open Network 2022; 7. Mavroudis et al. J. Clin. Ph. (2019); 8. Li et al. J. Clin Ph. (2020); 9. Liu et al. PNAS (2020), 10. Guglieri et al JAMA 2020; * Santhera Data on File; ** Studies as part of pediatric investigational plan (PIP)

Pivotal VISION-DMD: Study design

Randomized, double-blind, placebo and active control trial in 121 steroid-naïve patients, aged 4 – <7 years



Outcome measures

Primary efficacy outcome measure: TTSTAND velocity vs placebo at 24 weeks

Key secondary outcome measures: 6MWT, TTRW, TTCLIMB, NSAA, safety and tolerability

Primary endpoint met with high statistical significance at 24 weeks

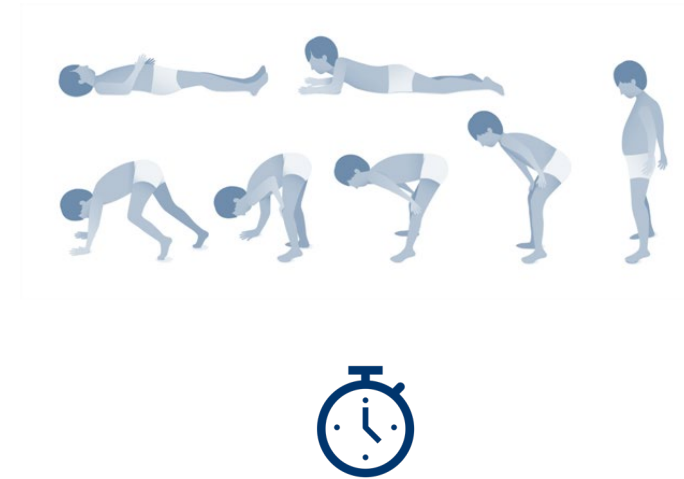
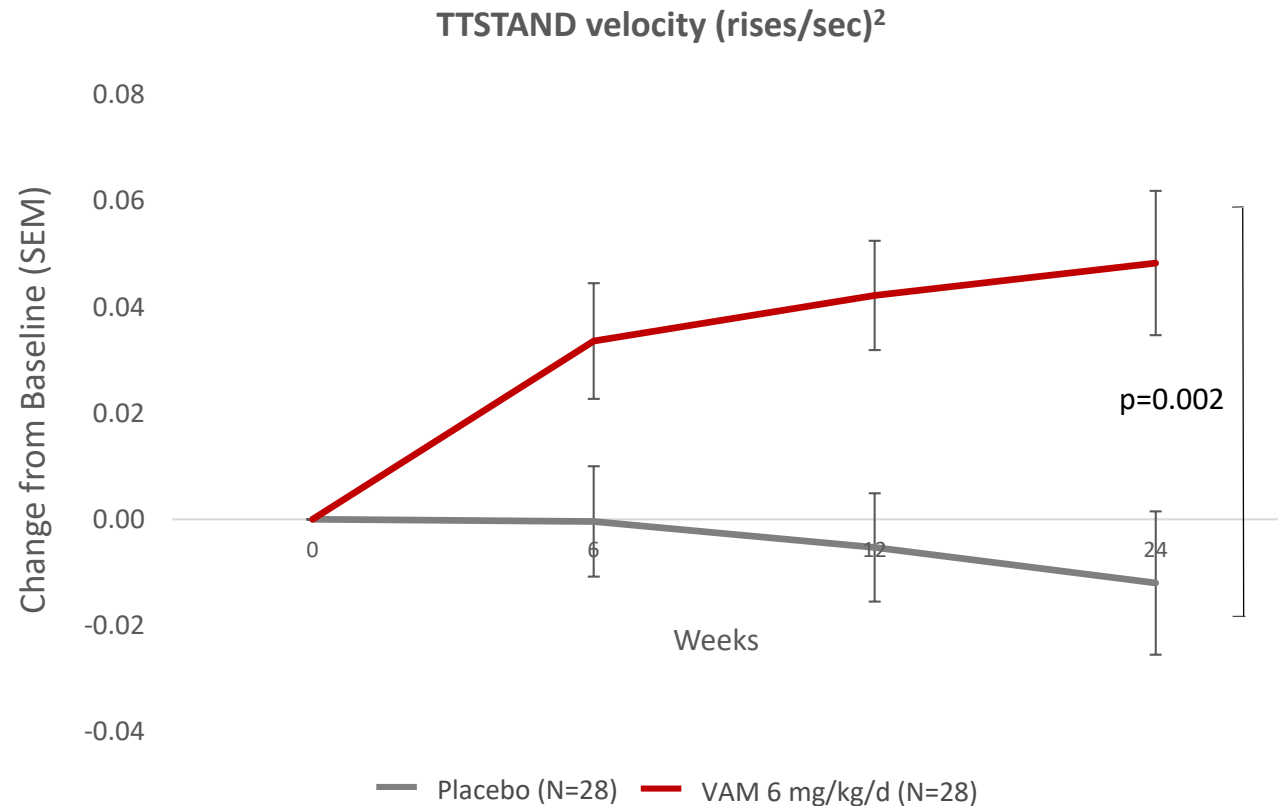
Consistent and robust efficacy shown by primary endpoint and majority of secondary endpoints for both vamorolone doses

Rank	Endpoint	Comparison vs placebo	Difference	MCID	P-value
Primary	TTSTAND velocity	vam 6mg/kg	0.06 rises/s	>0.023 rises/s ¹	0.002
Pre-Specified, Hierarchical Secondary	TTSTAND velocity	vam 2mg/kg	0.04 rises/s	>0.023 rises/s ¹	0.017
	6MWT	vam 6mg/kg	42 m	>26-32 m ^{2,3}	0.003
	6MWT	vam 2mg/kg	37 m	>26-32 m ^{2,3}	0.009
	TTRW velocity	vam 6mg/kg	0.24 m/s	>0.2 ^{1,2} m/s	0.002
	TTRW velocity	vam 2mg/kg	0.13 m/s	>0.2 ^{1,2} m/s	0.103
Exploratory	TTCLIMB velocity	vam 6mg/kg	0.07 task/s		<0.001
	TTCLIMB velocity	vam 2mg/kg	0.06 task/s		0.006
	NSAA	vam 6mg/kg	3.4 points	>2-3 points ^{4,5}	<0.001
	NSAA	vam 2mg/kg	3.2 points	>2-3 points ^{4,5}	<0.001

1. Guglieri JAMA 2020; Time to Stand (TTSTAND); 6 Minute Walk Test (6MWT); Time to Run/Walk 10m (TTRW); Time to Climb 4 Stairs (TTCLIMB); North Star Ambulatory Assessment (NSAA). mITT-1; MMRM estimates of changes from baseline to week 24, all doses daily.1. Duong et al J Neuromuscul Dis. 2021; 8(6):939-48; 2. McDonald et al, Muscle Nerve. 2013; 48(3):357-68; Henricson et al 2013; 4. Wong et al Neuromuscular Disorders. 2019; 29:S106.; 5. Haberkamp et al Neuromuscul Disord. 2019; 29(7):514-6; MCID: Minimum clinical important difference

Primary endpoint met with clinically relevant treatment difference

Observed difference of 0.06 rises/sec is expected to delay the time to loss of ambulation by 2-3 years¹

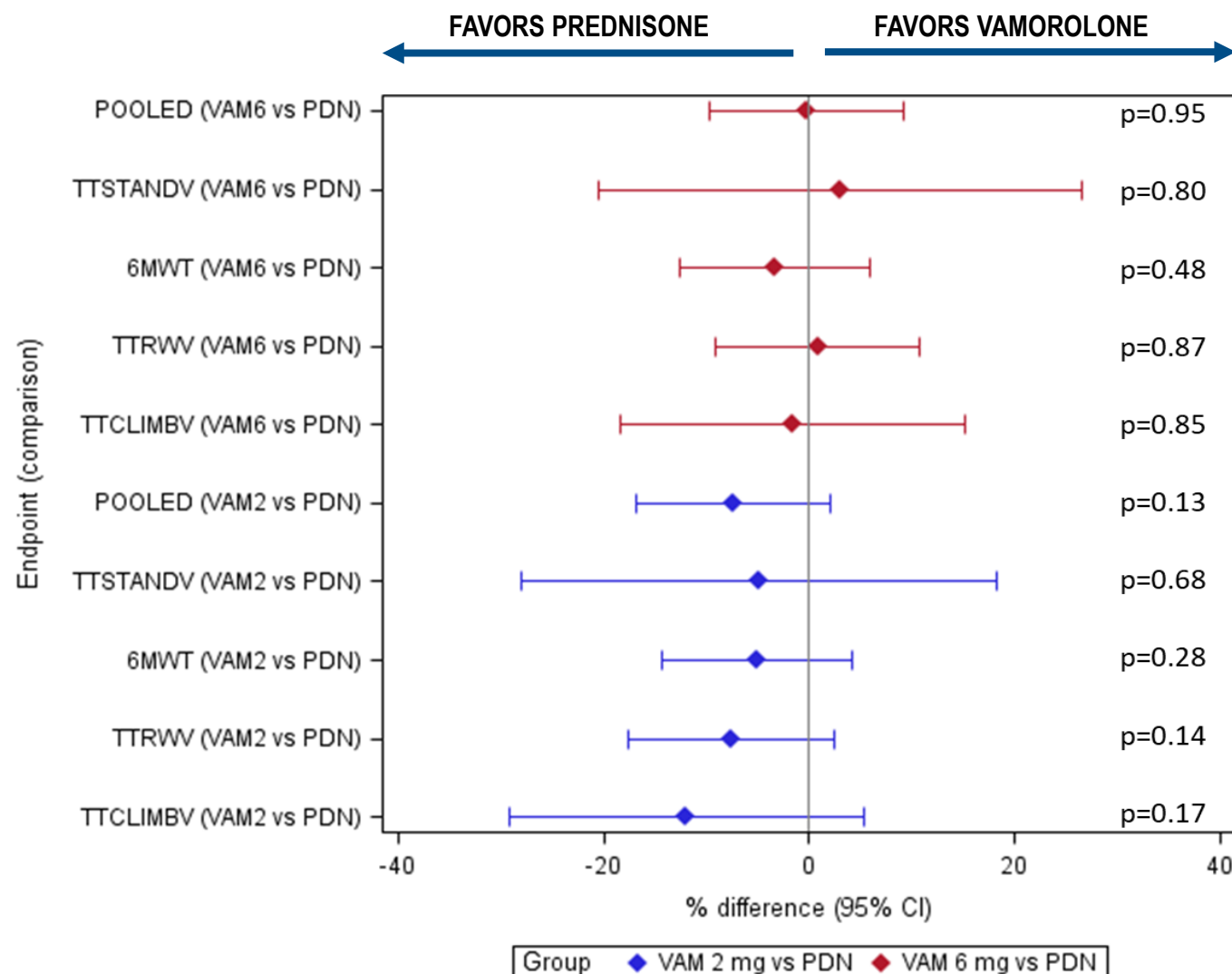


**23% improvement in time to rise after
6 months of treatment with VAM 6mg/kg/d³**

Rise time (sec) ²	BL	w 24	% Change
VAM 6 mg/kg/d	6.0	4.6	- 23%
Placebo	5.4	5.5	+ 2%

Comparable efficacy of vamorolone 6 mg/kg/d vs prednisone 0.75 mg/kg/d

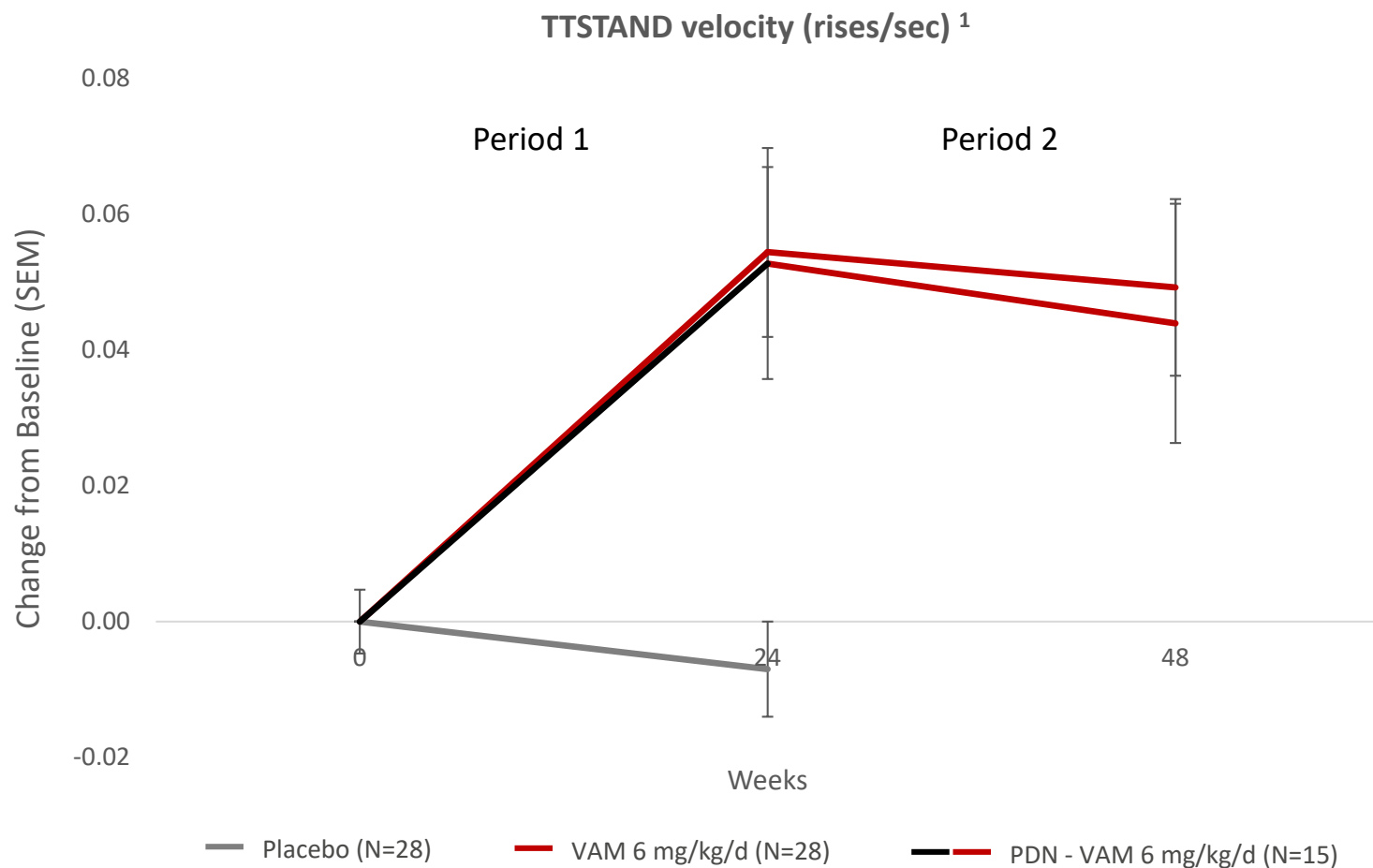
Difference between groups in percentual change from baseline at week 24 (post hoc analysis)



PDN: Prednisone 0.75 mg/kg/d; VAM: Vamorolone at 2 and 6 mg/kg/d; Time to Stand (TTSTAND), 6 Minute Walk Test (6MWT), Time to Run/Walk 10m (TTRW), Time to Climb 4 Stairs (TTCLIMB), North Star Ambulatory Assessment (NSAA).
Data on file (adapted from Poster 524 presented at WMS 2021), mITT-1

No loss of efficacy when switching from prednisone to vamorolone

Durable treatment effect maintained over 48 weeks with vamorolone 6 mg/kg/d¹



- During treatment period 1, patients on vamorolone 6 mg/kg/d showed same change in TTSTAND velocity as patients on prednisone before switching to vamorolone 6 mg/kg/d
- During treatment period 2, both groups showed same maintenance of effect
- Historical data consistently show that there is no further improvement with prolonged steroid treatment after the initial improvement in TTSTAND²

The FOR-DMD study provides external comparator data¹

Pre-specified analyses in double-blind, randomized, academic-run, independent study

DMD boys 4- <7
Steroid-naïve
N=121 (pivotal Phase 2b, 48-wks)
N=46 (LTE, 30-months)

VBP15-LTE: Phase 2a, open-label long-term extension up to 30 months (2-6 mg/kg/day)

Vision-DMD: Phase 2b 24-wk

Phase 2b 24-wk (wk 25-48)

6 months

12 months

30 months

DMD boys 4-8
Steroid-naïve
N=196 , 3-5 year follow-up

FOR-DMD

Prednisone 0.75 mg/kg/day

FOR-DMD

Prednisone 0.75 mg/kg/day 10 days on 10 days off

FOR-DMD

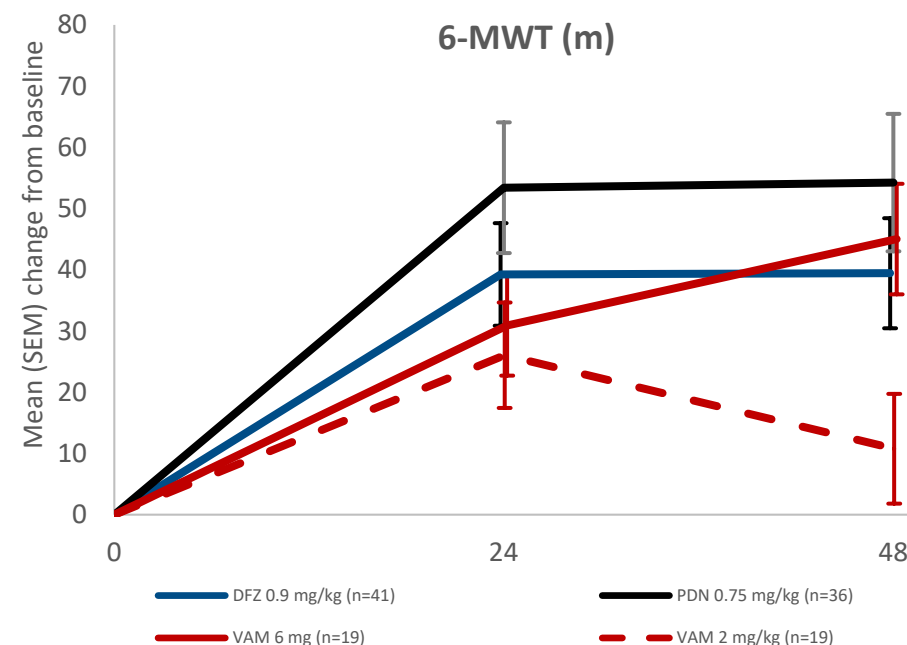
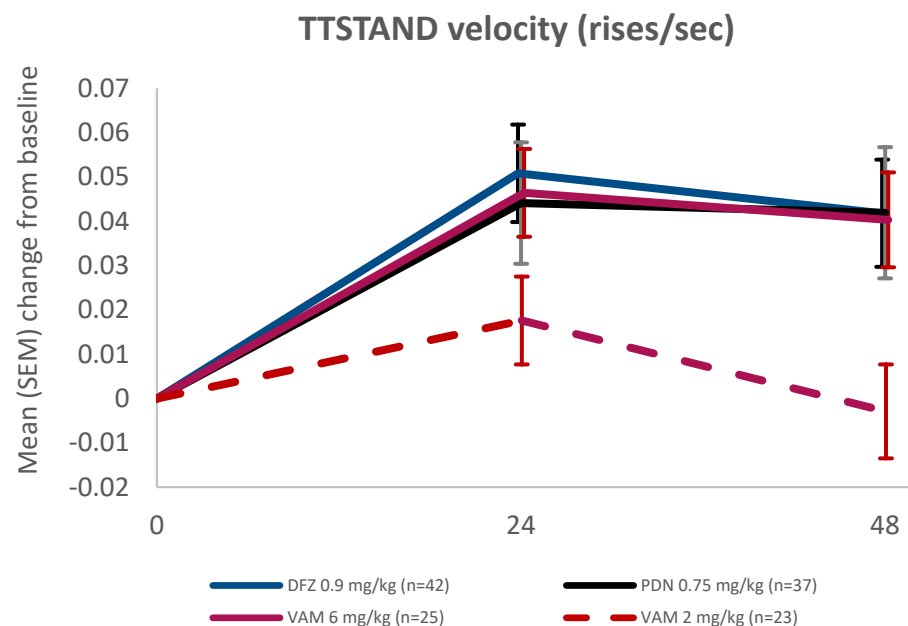
Deflazacort 0.90 mg/kg/day

Time point	Efficacy		Safety	
	Comparison	Method	Comparison	Method
24 weeks / 6 months	PDN (VISION-DMD) vs PDN (FOR-DMD)	Propensity score matching ²	PDN (VISION-DMD) vs PDN (FOR-DMD)	Inclusion criteria matching ³
48 weeks / 12 months	VAM vs PDN vs DFZ	Propensity score matching ²	VAM vs PDN vs DFZ	Inclusion criteria matching ³
2.5 years ⁴	Not applicable	Not applicable	VAM vs PDN vs DFZ	Inclusion criteria matching ³

1. Guglieri et al JAMA 2022 doi:10.1001/jama.2022.4315, 2. Pre-defined propensity scores calculated based on baseline age, TTSTAND, NSAA score, height and weight; analysis weighted by the propensity scores. Patients meeting the common inclusion criteria of all studies are included 3. For safety endpoints that require a long follow-up time, e.g. fractures, 4. Mah et al JAMA Network Open 2022 e2144178. doi:10.1001/jamanetworkopen.2021.44178. Efficacy and safety comparisons pre-specified.

VISION-DMD pre-specified* analyses vs FOR-DMD external control

Propensity matched cross study comparison shows comparable efficacy for
vamorolone 6 mg/kg/d versus standard of care corticosteroid treatment

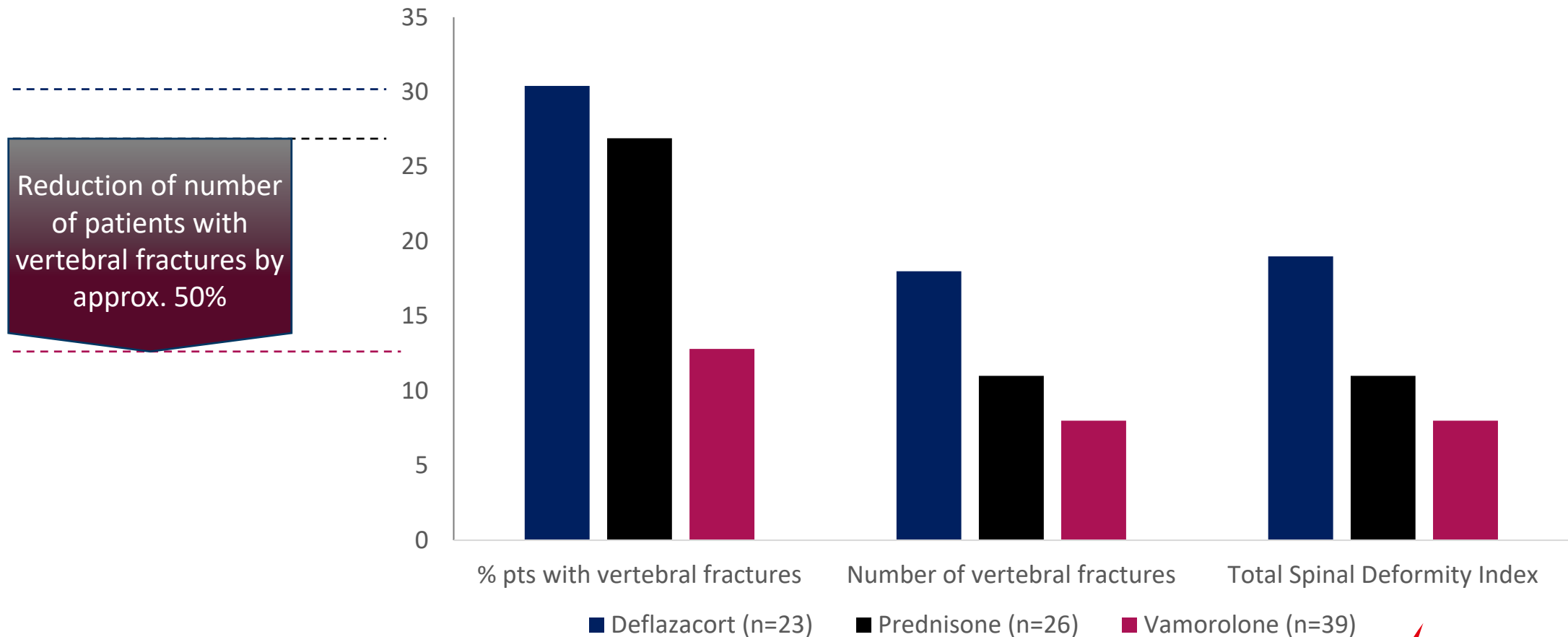


Fewer and less severe spinal fractures with vamorolone compared to classical corticosteroids over 2.5 years



Bone Health

Vamorolone long-term extension (LTE) study vs FOR-DMD, matched comparison, central reading using modified Genant grades¹



Bone biomarker data from VISION-DMD study supports findings on long-term bone health



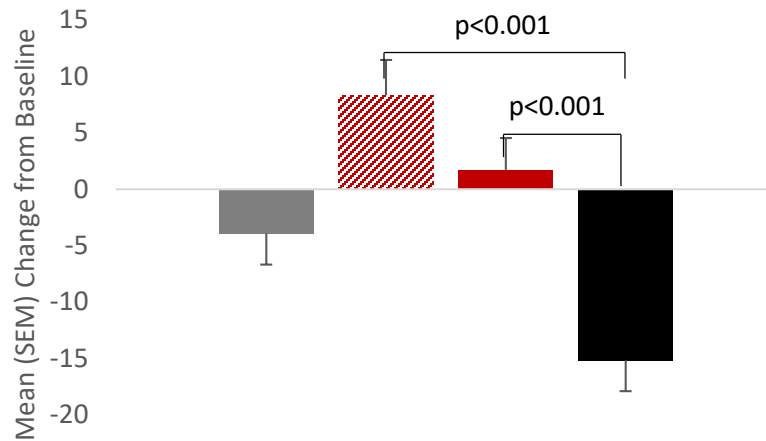
Bone Health

Unlike classical corticosteroids, vamorolone does not have a negative impact

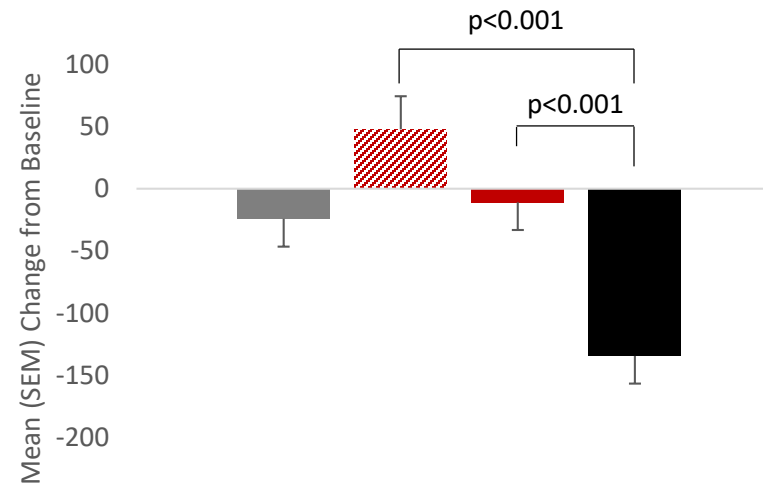
Biomarkers of bone formation¹

Biomarkers of bone remodelling¹

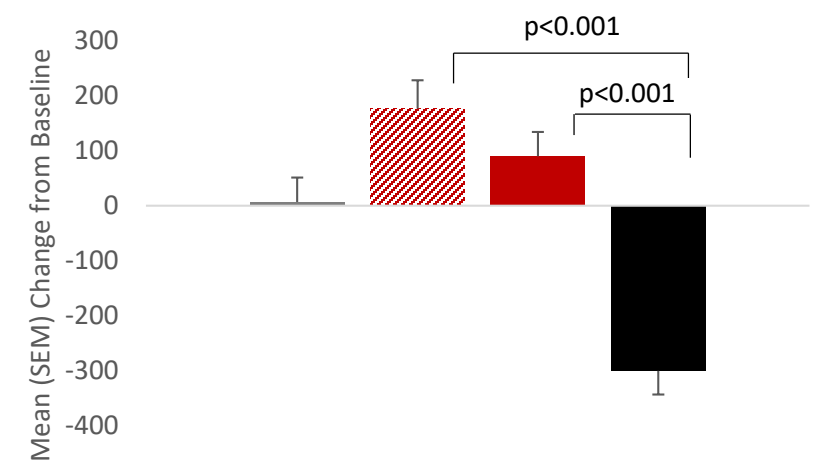
Osteocalcin (ng/ml)



P1NP (ng/ml)



CTX1 (pg/ml)



■ Placebo ▨ VAM 2 mg/kg/day ■ VAM 6 mg/kg/day ■ PDN 0.75 mg/kg/day

1. Data on File : VAM-2021-007, PDN, prednisone; SEM, standard error of mean; VAM, vamorolone. CTX1, C-terminal telopeptide of type 1 collagen; P1NP, procollagen type 1 N-terminal pro-peptide. Safety population (SAF-1) at 24 weeks, pre-specified analysis

Bone biomarker data from VISION-DMD study supports findings on long-term bone health



Bone Health

Rapid recovery of bone biomarkers after switching from prednisone

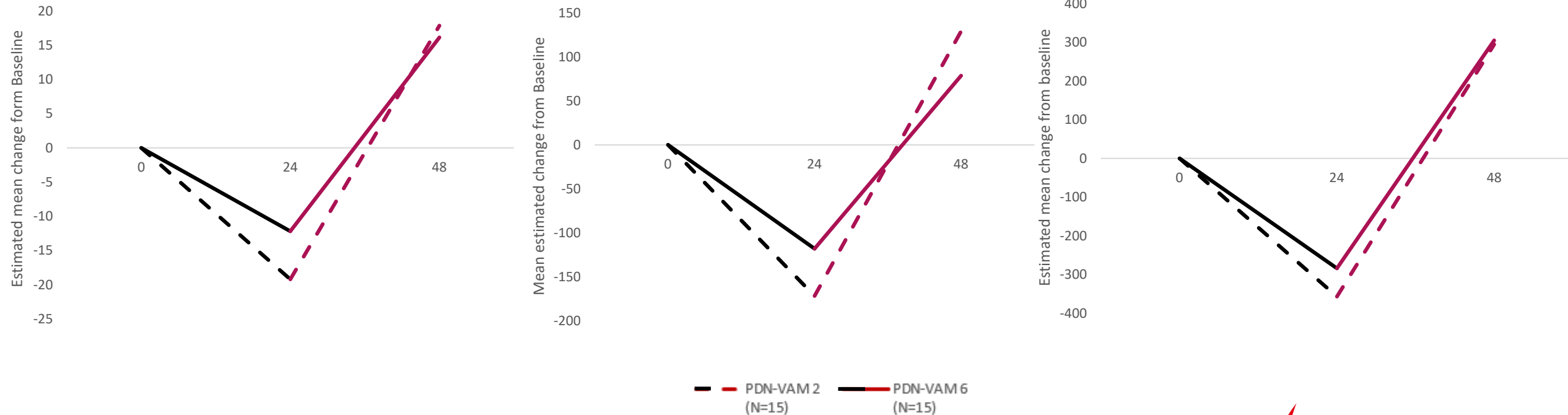
Biomarkers of bone formation¹

Biomarkers of bone remodelling¹

Osteocalcin (ng/ml)

P1NP (ng/ml)

CTX1 (pg/ml)



Vamorolone allows for normal bone development and growth

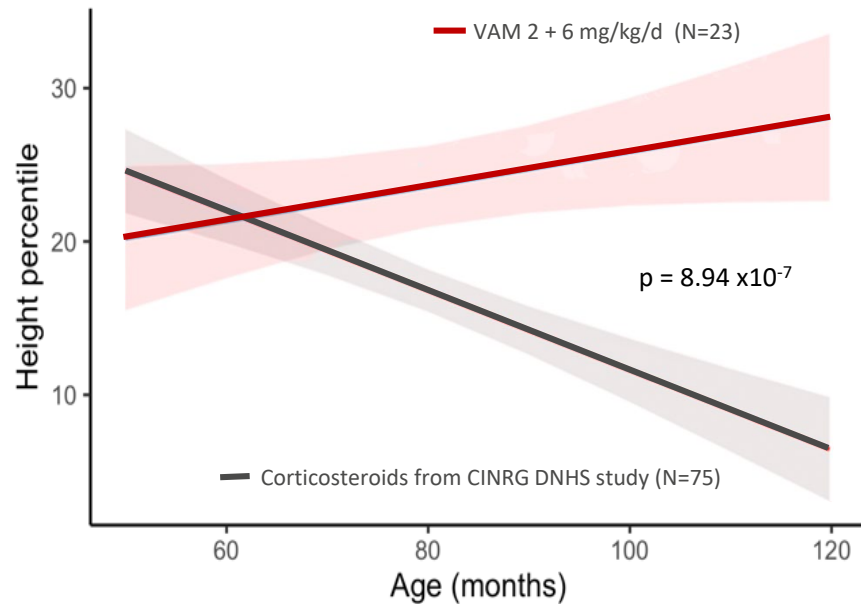
Comparison to natural history data and in patients switching from prednisone



Bone Health

Vamorolone did not stunt growth unlike other corticosteroids used in DMD

Modelling of height trajectory from long-term vamorolone data and corticosteroids from CINRG Natural History Data²



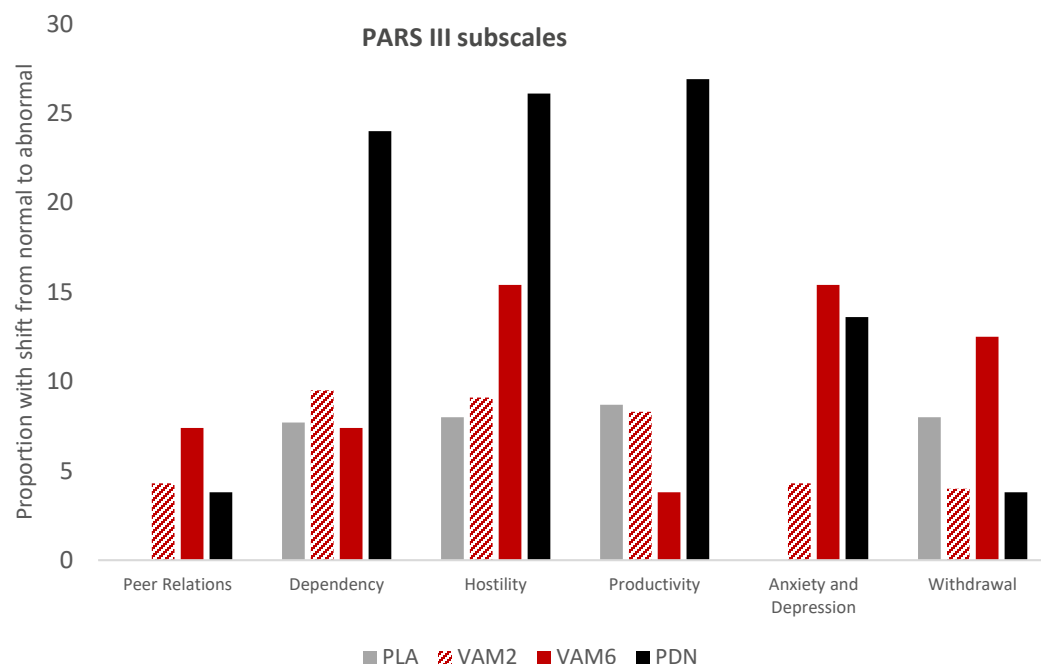
Switching from prednisone to vamorolone recovers normal growth trajectory (VISION-DMD study)



Fewer and less severe behavioral problems reported with vamorolone

Comparison of behavioral problems reported for vamorolone vs prednisone at week 24

VISION-DMD Study	Placebo N = 29	Prednisone 0.75 mg/kg/d N = 31	Vamorolone 2 mg/kg/d N = 30	Vamorolone 6 mg/kg/d N = 28
Behavior problems AESIs, N (%)	4 (13.8)	10 (32.3)	5 (16.7)	6 (21.4)
Moderate/severe AESIs, N (%)	1 (3.4)	7 (22.6)	1 (3.3)	-
AESIs leading to discontinuation, N (%)	0	1 (3.2)	0	0



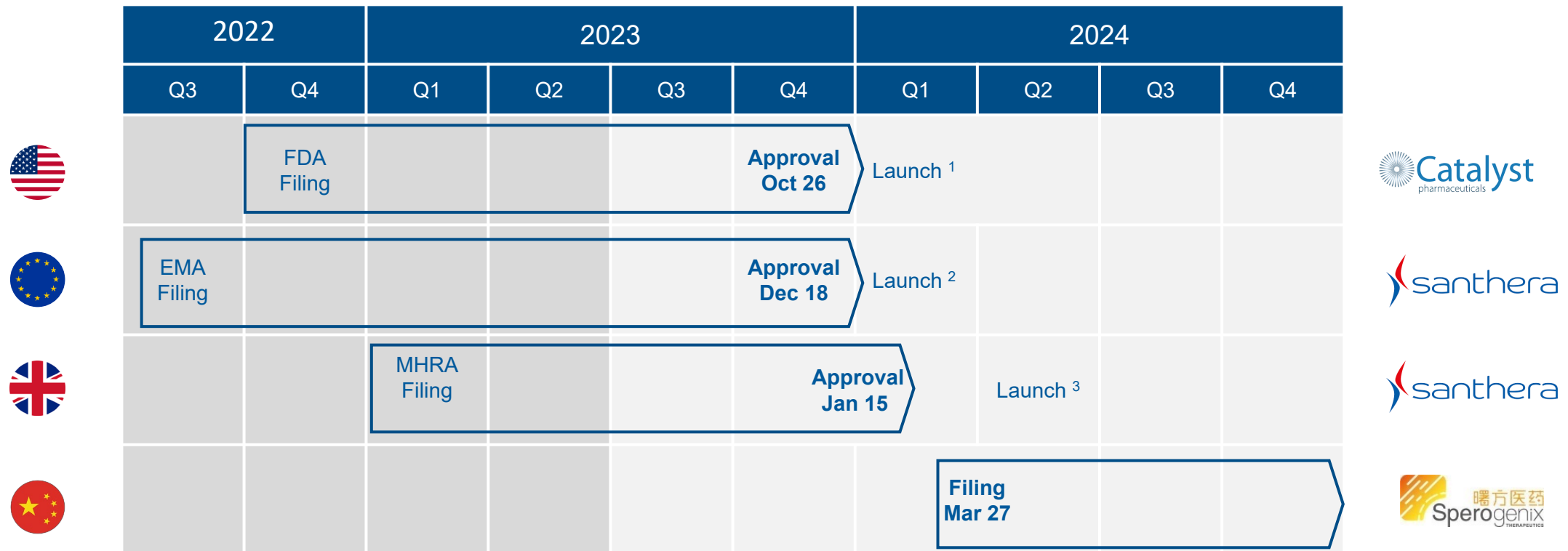
PARS III scale: proportion of patients shifting from normal to a clinically relevant worsening by subscale, defined as shift from normal adjustment score (z-score <1) at baseline to abnormal adjustment score (z-score ≥1) at Week 24 based on normative data from Henriksen 2009

AGAMREE® (vamorolone) clinical data value proposition

- **Durable efficacy comparable to standard of care with AGAMREE® 6 mg/kg/day**
 - Statistically robust efficacy vs placebo at 24 weeks for both 2 mg/kg/day and 6 mg/kg/day
 - No loss of efficacy when switching from prednisone to vamorolone
 - Long-term efficacy of vamorolone 6mg/kg/day comparable to standard of care corticosteroids at 48 weeks
- **Preserved bone health with AGAMREE®, unlike deleterious effect of standard of care corticosteroids (CS)**
 - Normal bone turnover biomarkers and reduction of risk of spinal fractures with long-term treatment vs CS
 - Height trajectory as expected from CDC normalized growth curves unlike CS and comparable to placebo
- **Improved safety profile compared to prednisone evident in the first 24 weeks**
 - Placebo-like treatment emergent adverse events (TEAEs) with vamorolone 2 mg/kg/day
 - Fewer and milder TEAEs with vamorolone 6mg/kg/day compared to prednisone, including behavioral problems
- **Effective 3-fold dose range with a dose-dependent safety profile allows for individualized dose adjustment as needed to best manage tolerability to maintain treatment long-term**

Full approval by FDA, EMA and MHRA for AGAMREE® in DMD

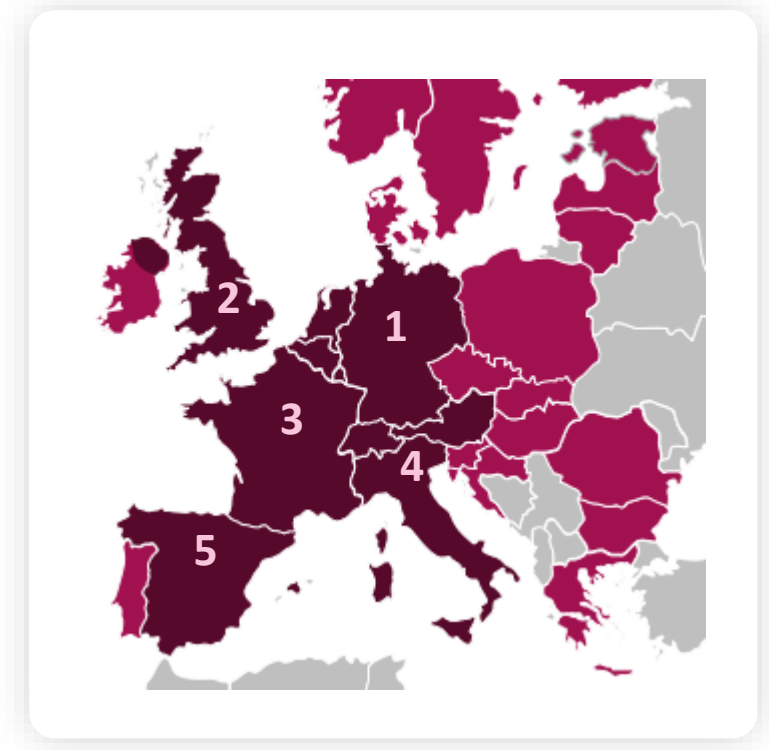
- Approvals for all patients of age 2 (US) or 4 (EU, UK) years and older; launch in Germany as of Jan 15, 2024
- Orphan drug exclusivity in U.S. (7 years) and Europe (12 years incl. pediatric extension)
- Patent protection at least until 2040 (U.S.) and 2035 (EU)



Santhera commercial launch in key European geographies

Santhera aims to market vamorolone in DMD itself in core territory with population of ~340 million

- **First launch in Germany in January 2024**
 - Staged roll-out across the key European markets
 - Strong and growing stakeholder support
- **Lean commercial organization**
 - Up to 60 incremental employees over next two years
 - Country activities supported by central hub
- **European market opportunity in DMD alone**
 - Expected peak sales of EUR >150 million in Santhera territory
 - Additional revenue from distribution partners

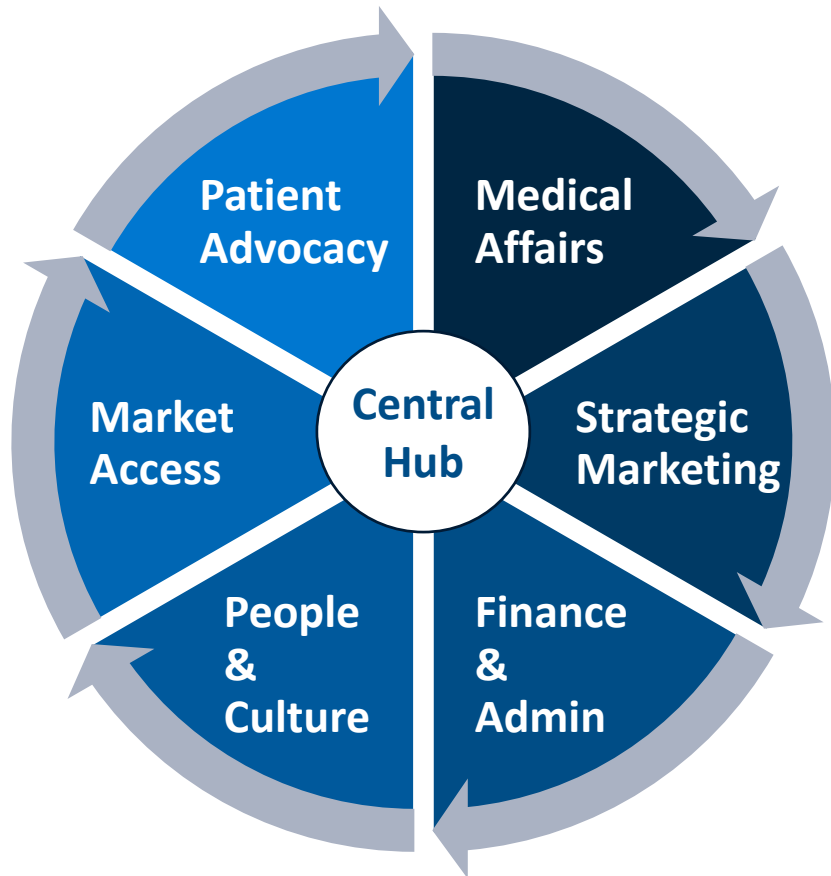


Santhera

Partners

Santhera commercial set-up with central hub structure at headquarters

Headquarter core functions collaborate with license partners and support own lean own country teams as well as distribution partners



License Partners

- Catalyst
- Sperogenix

Santhera Organizations

- D-A-CH
- United Kingdom
- France
- Italy
- Spain
- Benelux

Distributors

- EU non-core
- RoW

Market opportunity to change the foundational therapy in DMD

AGAMREE® can address the shortcomings of current standard of care corticosteroid use

- **Current corticosteroid use**

- With 60-70% of patients on steroid treatment, currently up to 8,000 boys/men are being treated with standard corticosteroids in the Santhera own commercialization markets* alone^{1,2}

- **AGAMREE® opportunity for change**

- Replacing current corticosteroid treatment initiation
- Switching patients from standard corticosteroids
- Restarting treatment for patients recently discontinued

- **Peak market size potential (Santhera)**

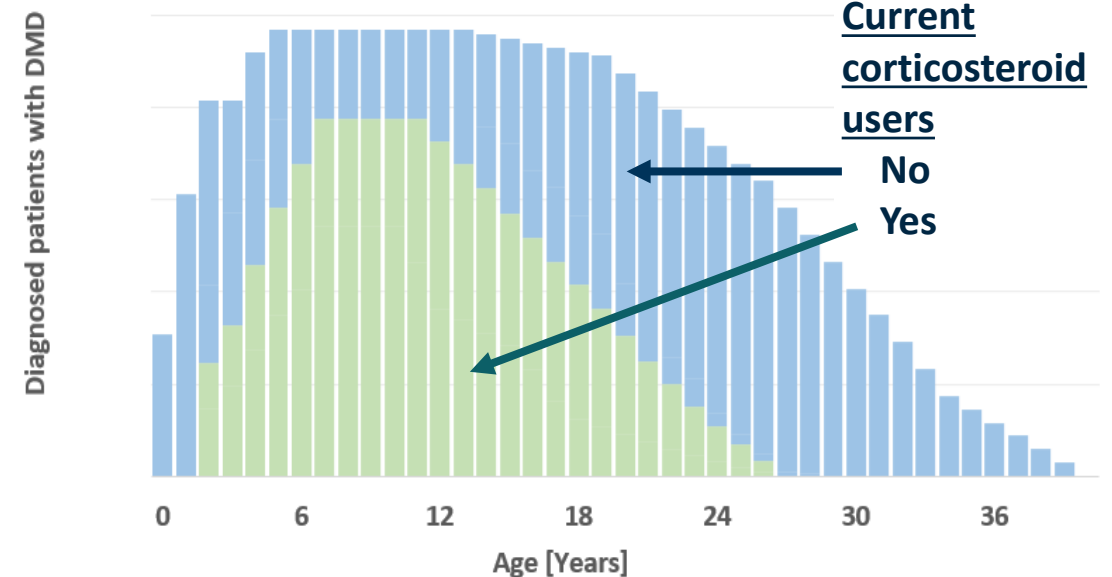
- Estimated range of 3,000 to 4,000 patients on AGAMREE®
- Standard range of orphan drug pricing leads to peak sales estimate exceeding EUR >150 million

Issues with current steroid use

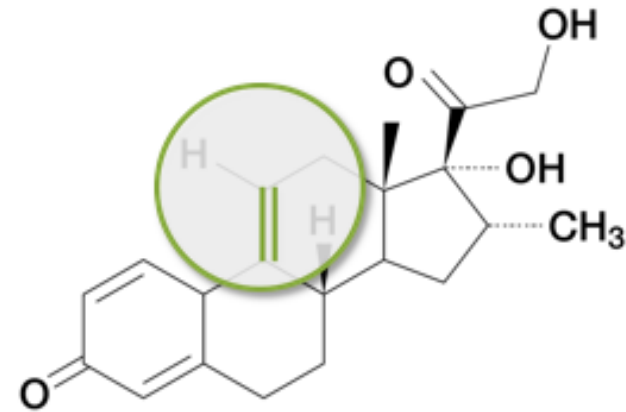
Too late
Initiation

Too little
Dose

Too soon
Discontinuation



Vamorolone in Becker muscular dystrophy



Becker muscular dystrophy (BMD) disease profile and corticosteroid use

Genetics	Cause	Patients	Symptoms	Medical need
X-linked recessive form of muscular dystrophy typically diagnosed between age 5 and 15	Partial loss of function of dystrophin with a broad clinical variability	Higher life expectancy and lower prevalence than DMD (approx. 1/3)	Progressing muscle weakness and degeneration with later and slower onset compared to DMD	No approved treatment and under-represented development efforts

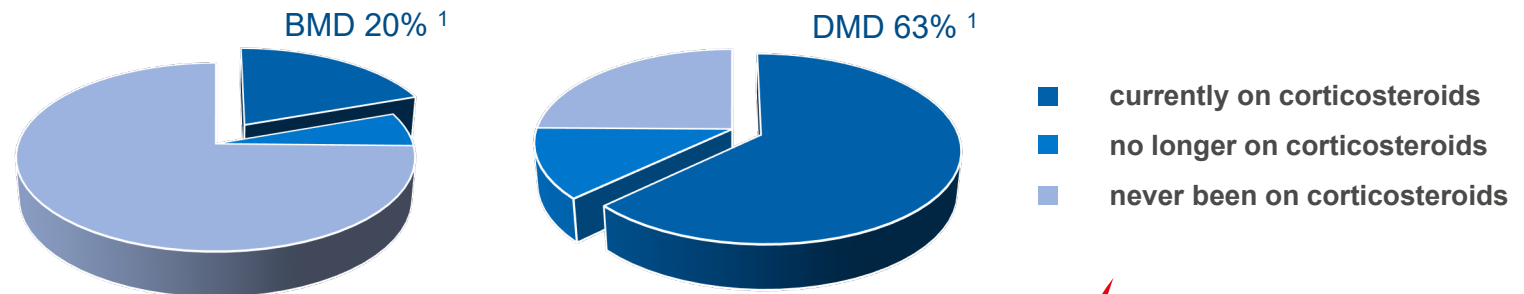
CORTICOSTEROIDS IN BMD

Steroid use is lower compared to DMD due to perceived less favorable benefit-risk ratio for current steroids¹

Vamorolone addresses safety concerns and may qualify for a chronic treatment in BMD

Evidence for corticosteroid use in BMD

- Efficacy from limited patient case studies
- Data from *in vivo* models of inflammation

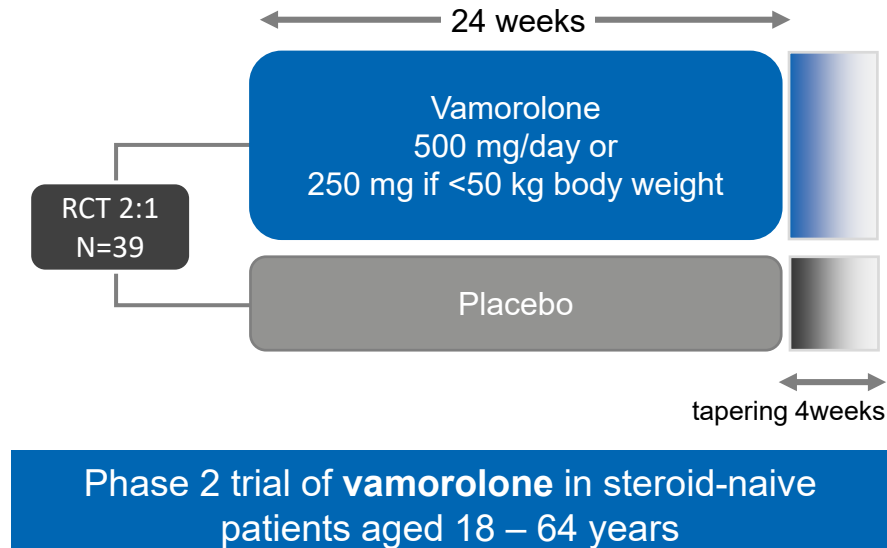


Vamorolone holds promise in BMD based on data generated for DMD

Vamorolone designated orphan drug status by FDA in January 2024

Vamorolone potential benefits in BMD^{1,2}

1. Anti-inflammatory agent with reduced side effects via dissociative character of vamorolone
2. Cardiac benefit via mineralocorticoid antagonism
3. Potential to increase dystrophin levels via suppression of dystrophin-targeted microRNAs



	NCT05166109
Sponsor	ReveraGen
Objectives	Safety and efficacy
Centers	Pittsburgh (USA), Padua (IT)
PI	P. Clemens, USA
Funding	FDA , NIH, Foundation Eradicate Duchenne

CURRENT CLINICAL DEVELOPMENT IN BMD (all three drugs are developed both in BMD and DMD)³

- Phase 2 completed: Givinostat (Italfarmaco), 12-month treatment in 51 patients
- Phase 2 recruiting: EDG-5506 (Edgewise), 12-month treatment in 54 patients
- Phase 2 recruiting: Vamorolone (ReveraGen/Santhera), 24-week treatment in 39 patients
- Natural history study ongoing: (Edgewise), 24-month observational study in 150 patients

Santhera financial status

Santhera Pharmaceuticals is listed on the Swiss Stock Exchange SIX: Ticker SANN

- **Key figures (CHF million* as of Dec 31, 2023)**

• Net (income) for the period	54.8
• Cash (used) in operations	(47.6)
• Cash & cash equivalents	30.4
• Debt outstanding (maturity August 2024) **	(20.9)
• Shareholders' equity	60.5

- **Key figures (CHF million* as of Mar 31, 2024)**

• Revenue for the period	4.7
• Cash & cash equivalents	26.8

- **Cash runway**

- Into 2025 incl. commercial EU infrastructure & launch***

- **Recent milestones AGAMREE® for DMD**

- 07-2023: North American licensing to Catalyst
- 10-2023: US approval by FDA
- 12-2023: EU approval by European Commission
- 01-2024: UK approval by MHRA
- 01-2024: Launch in Germany on Jan 15, 2024
- 03-2024: Launch in U.S. on Mar 12, 2024
- 03-2024: NDA filed in China by partner Sperogenix

- **Capital structure**

- Basic shares outstanding 12.6 million
- Market capitalization CHF 120 million (per share CHF 9.5)
- Major shareholders Catalyst (11.2%) and Idorsia (10.3%)
- Research by H.C. Wainwright, Octavian and valuationLAB



Santhera Pharmaceuticals

Developing medicines to meet the needs of
patients living with rare diseases

April, 2024